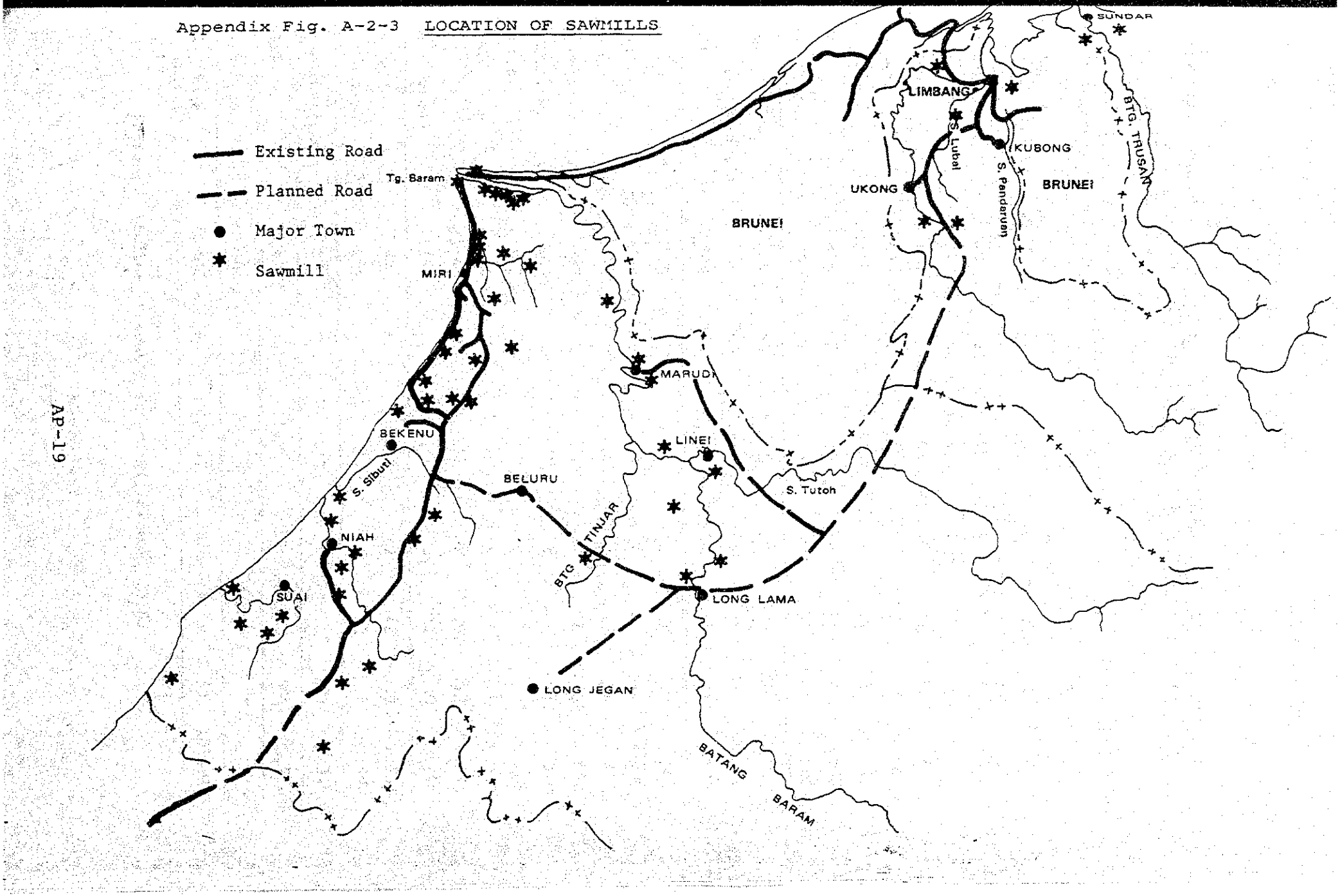
Appendix Table A-2-8 SAWMILL OPERATION IN MIRI SECTION

Section	Number of Sawmills			Total No. Sawmills	Average Labour Employed						Sawn Timber Conversion		Remarks
	Vertical Band	Horizontal Band	Circular		Chinese	Iban	Malay	Melanau	Others	Total	In-put (hop. ton)	Out-put (Cu. ton)	
Miri	14	4	21	39*	268	292	252	18	38	868	90,399.77	42,298.54	*Including 3 domestic and belian mills, and 4 new licences issued during the year.
Section					(25)	(23)	(6)	-	(1)	(55)			
				TOTAL:	293	315	258	18	39	913			

NOTE: Figures in brackets denotes the No. of female employees.

Source; Forest Department Annual Report 1977, Miri Section

Appendix Fig. A-2-3 LOCATION OF SAWMILLS



Appendix Table A-2-9 ARRIVALS OF VISITORS BY PERMANENT PLACE OF RESIDENCE AND PURPOSE OF VISIT, 1976

Permanent Place of Residence	Leisure/ Holiday	Education	Business	Official	Transit	Others	Total
Canada	487	3	135	39	32	82	778
U.S.A.	1,971	28	499	45	56	115	2,714
Hong Kong	406	1	245	11	13	26	702
Japan	733	5	1,136	35	24	36	1,969
Philippines	114	2	66	36	23	15	256
Indonesia	698	14	109	57	247	118	1,243
Singapore	5,169	13	4,558	45	145	107	10,037
India	646	2	125	20	16	29	838
Other Asia	266	2	183	38	31	62	582
Brunei	46,441	89	1,954	38	436	274	49,232
Peninslar Malaysia	8,606	305	6,668	1,748	234	859	18,420
Sabah	3,889	164	1,191	227	215	144	5,830
Belgium	125	1	24	1	1	6	158
France	769	3	75	7	13	23	890
Germany	983	2	140	17	23	47	1,212
Netherlands	585	2	156	34	98	166	1,041
Switzerland	265	1	25	3	3	13	310
Austria	147	-	8	2	1	-	158
Italy	244	-	28	5	2	1	280
U.K.	1,546	13	791	92	75	218	2,735
Other Europe	144	-	77	3	12	10	246
Australia	939	10	279	62	48	93	1,431
New Zealand	222	3	34	3	2	36	300
Other Countries	277	2	33	7	5	24	348
Total	75,672	665	18,539	2,575	1,755	2,504	101,710
Not Stated	185	1	8	4	-	5	203
Grand Total	75,857	666	18,547	2,579	1,755	2,509	101,913

Source; Visitor Arrival Statistics, Sarawak, 1976.

Appendix Table A-2-10 ARRIVALS OF VISITORS BY NATIONALITY, SARAWAK

Nationality	1972 Persons	1972 (%)	1973 Persons	1973 (%)	1975 Persons	1975 (%)	1976 Persons	1976 (%)	Annual Growth Rate(%)
U.S.A.	2,304	3.8	2,518	3.8	2,889	3.7	3,463	3.7	10.0
Canada	400	0.7	502	0.7	515	0.7	901	1.0	17.9
Japan	1,638	2.7	1,790	2.7	1,973	2.5	1,958	2.1	4.6
India	1,322	2.2	949	1.4	899	1.2	1,090	1.2	-4.3
Brunei	20,559	34.0	22,492	33.9	26,130	33.4	36,778	39.5	14.0
Indonesia	1,019	1.7	1,595	2.4	1,563	2.0	1,169	1.3	2.6
Singapore	6,338	10.5	6,240	9.4	7,814	10.0	8,573	9.2	8.6
Malaysia	16,918	28.0	19,517	29.4	21,664	27.7	24,498	26.3	8.8
Other Asia	1,421	2.3	1,260	1.9	1,184	1.5	1,430	1.5	-0.5
France	487	0.8	662	1.0	972	1.2	974	1.0	19.4
Germany	492	0.8	726	1.1	2,435	3.1	1,416	1.5	39.4
Netherlands	1,515	2.5	1,627	2.5	1,995	2.6	2,225	2.4	10.2
U.K.	3,547	5.9	3,641	5.5	4,428	5.7	4,794	5.1	8.3
Other Europe	1,009	1.7	1,145	1.7	1,406	1.8	1,393	1.5	8.9
Australia	986	1.6	1,156	1.7	1,552	2.0	1,698	1.8	14.8
New Zealand	242	0.4	317	0.5	320	0.4	365	0.4	8.7
Other Countries	246	0.4	250	0.4	410	0.5	434	0.5	17.7
Total	60,443	100.0	66,387	100.0	78,149	100.0	93,159	100.0	10.8
Not Stated	14		2		42		77		-
Stateless Persons	10,684		12,997		8,009		8,677		-
Grand Total	71,141		79,386		86,200		101,913		8.3

Source; Annual Statistical Bulletin, Sarawak

Appendix Table A-2-11 ARRIVALS OF VISITORS BY PURPOSE OF VISIT, SARAWAK

Purpose of Visit	1973	1974	1975	1976 (%)
Leisure/Holiday	71.7	71.3	71.0	74.4
Education	0.1	0.5	0.6	0.7
Business	18.3	19.2	20.3	18.2
Official	2.8	2.7	4.0	2.5
Transit	2.0	1.9	2.2	1.7
Others	5.1	4.4	1.9	2.5
Total	100.0	100.0	100.0	100.0

Source; Annual Statistical Bulletin, Sarawak

Appendix Table A-2-12 ARRIVALS OF VISITORS BY MODE OF TRANSPORT, POINT OF ENTRY AND PURPOSE OF VISIT, 1976

Mode of Transport	Point of Entry	Purpose of Visit: Leisure/ Holiday	Education	Business	Official	Transit	Others	Total
AIR	Kuching	14,144	464	10,253	1,767	720	1,230	28,578
	Miri	3,224	56	4,162	439	209	368	8,458
	Others	128	2	100	7	12	33	282
	Sub-total	17,496	522	14,515	2,213	941	1,631	37,318
SEA	Kuching	473	5	40	199	65	128	910
	Limbang	19,502	5	802	31	214	60	20,614
	Lawas	790	7	100	4	4	33	938
	Sundar	1,395	1	26	3	112	10	1,547
	Others	101		-	22	249	17	408
	Sub-total	22,261	18	987	259	644	248	24,417
LAND	Sungei Tujoh	37,754	122	3,032	107	153	599	39,767
	Biawak	174	-	-	-	6	20	200
	Others	172	4	13	-	11	11	211
	Sub-total	36,100	126	3,045	107	170	630	40,178
TOTAL		75,857	666	18,547	2,579	1,755	2,509	101,913

Source; Annual Statistical Bulletin, Sarawak, 1976.

Appendix Table A-2-13
ARRIVALS OF VISITORS BY MODE OF TRANSPORT, SARAWAK

Mode of Transport	1972	1973	1975	1976	Average Annual Growth Rate (%)
Air ; Number	24,704	29,460	35,527	37,318	10.7
(%)	(34.7)	(37.1)	(41.2)	(36.6)	
Sea ; Number	17,358	18,708	18,442	24,417	6.9
(%)	(24.4)	(23.6)	(21.4)	(24.0)	
Land ; Number	29,079	31,218	32,231	40,178	7.0
(%)	(40.9)	(39.3)	(37.4)	(39.4)	
Total ; Number	71,141	79,386	86,200	101,913	8.3
(%)	(100.0)	(100.0)	(100.0)	(100.0)	

Source; Annual Statistical Bulletin, Sarawak, 1973 and 1976.

Appendix Table A-2-14
ARRIVALS OF VISITORS BY INTENDED LENGTH OF STAY, 1976

Intended Length of Stay	AIR		SEA		LAND		TOTAL	
	Persons	(%)	Persons	(%)	Persons	(%)	Persons	(%)
Less than 1 day	507	(1.4)	12,856	(53.2)	2,659	(6.6)	16,022	(15.9)
1 - 3 days	8,568	(23.3)	4,771	(19.7)	18,323	(45.8)	31,662	(31.4)
4 - 7 days	11,539	(31.4)	3,547	(14.7)	13,900	(34.7)	28,986	(28.7)
8 - 14 days	10,069	(27.4)	2,456	(10.2)	3,779	(9.4)	16,304	(16.2)
15 - 21 days	1,121	(3.1)	70	(0.3)	251	(0.6)	1,442	(1.4)
22 days to 1 month	587	(1.6)	54	(0.2)	84	(0.2)	725	(0.7)
1 - 3 months	2,406	(6.6)	150	(0.6)	517	(1.3)	3,073	(3.0)
3 - 6 months	660	(1.8)	41	(0.2)	156	(0.4)	857	(0.8)
6 months to 1 year	366	(1.0)	30	(0.1)	178	(0.5)	574	(0.6)
Over 1 year	899	(2.4)	186	(0.8)	210	(0.5)	1,295	(1.3)
Total	36,722	(100.0)	24,161		40,057		100,940	
Not Stated	596		256		121		973	

Source; Annual Statistical Bulletin, Sarawak.

Appendix Table A-2-15
MONTHLY VARIATION OF ARRIVALS OF VISITORS, SARAWAK

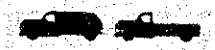
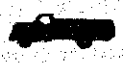
(%)

Month	1973	1974	1975	1976
January	6.7	7.1	7.2	6.1
February	7.2	6.8	7.0	7.1
March	6.5	8.0	8.5	7.3
April	9.6	9.3	9.6	8.8
May	8.6	8.0	8.5	9.0
June	8.2	7.9	7.0	7.9
July	9.5	8.6	8.5	8.4
August	10.5	10.2	10.1	8.7
September	7.7	7.9	7.5	9.8
October	8.8	8.7	8.8	7.8
November	7.6	7.2	7.7	8.3
December	9.1	10.3	9.6	10.8
TOTAL	100.0	100.0	100.0	100.0

Source; Annual Statistical Bulletin, Sarawak, 1973 and 1976.

Appendix Fig. A-3-1 TRAFFIC COUNT SURVEY SHEET

Station No.	Date of Count	Weather	Direction	Name of Surveyor	Name of Supervisor	Sheet No.
			—			

Type of Vehicle	0 ~ 1	1 ~ 2	2 ~ 3	3 ~ 4	4 ~ 5	5 ~ 6	6 ~ 7	7 ~ 8	8 ~ 9	9 ~ 10	10 ~ 11	11 ~ 12	12 ~ 13	13 ~ 14	14 ~ 15	15 ~ 16	16 ~ 17	17 ~ 18	18 ~ 19	19 ~ 20	20 ~ 21	21 ~ 22	22 ~ 23	23 ~ 24	Total
1. Car 																									
2. Taxi 																									
3. Van, pick-up 																									
4. Medium truck 																									
5. Heavy truck 																									
6. Truck-trailer 																									
7. Bus 																									
8. Motor cycle																									
9. Bicycle																									
10. Others																									
Total																									

BELURU/LONG LAMA/LIMBANG ROAD PROJECT

Station No.		Name of Interviewer	Sheet No.	1. Time of interview (Enter actual time)
Date of interview				
Weather		Name of supervisor		
Direction				

2. Type of vehicle

1	Car	6	Truck-trailer
2	Taxi	7	Bus
3	Van, Pick-up	8	Motor cycle
4	Medium truck	9	Bicycle
5	Heavy truck	10	Others

Model of the vehicle		5. Origin	6. Destination	7. Trip purpose	Passenger cars		Trucks			13. Average travel time	14. Major points en route
3. Model/ Make	4. Age	Name of the place where you start the trip	Name of the place where you finally finish the trip	1. Home-Workplace 2. Work 3. To Home 4. Social intercourse, recreation 5. Others	8. Capacity (No. of persons)	9. No. of Passengers aboard	10. Loading Capacity (tons)	11. Type of Commodities carried	12. Weight of the Commodities (tons)		Name of route or municipality en route

1. Time	2. Type of vehicle	3. Model/make of the vehicle	4. Age	5. Origin	6. Destination	7. Trip purpose	8. Capacity	9. No. of pass.	10. Loading capacity	11. Type of commodities carried	12. Weight	13. Average travel time	14. Major points en route

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BELURU/LONG LAMA/LIMBANG ROAD PROJECT

Appendix Fig. A-3-3 INTERVIEW SHEET FOR PASSENGERS (WATER TRANSPORT)

Station No.		Name of Interviewer	Sheet No.	1. Time of interview (Enter actual time)	2. Origin Name of the place where you start the trip.	3. Destination Name of the place where you finally finish the trip	4. Major places en route Name of route or municipality en route
Date of interview							
Weather		Name of Supervisor	/				
Direction							
–							

5. Trip purpose

1.	Home-Work place
2.	Work
3.	To Home
4.	Social intercourse, recreation
5.	Others

6. Transport means before/after

1.	On foot
2.	Bus
3.	Car/taxi
4.	Boat
5.	Others

7. Average travel time (min.)

8. Sex

1.	Male
2.	Female

9. Age

10. Occupation

1.	Managerial staff	5.	Student
2.	Supervisor or craftman	6.	Housewife
3.	Shop or office clerk	7.	Unemployed
4.	Part-time workers	8.	Others (Specify)

1. Time	2. Origin	3. Destination	4. Major places en route	5. Trip purpose	6. Transport means before/after	7. Average Travel time	Passenger Characteristics 8. Sex	9. Age	10. Occupation	11. Race

BELURU/LONG RAMA/LIMBANG ROAD PROJECT

Station No.		Name of Interviewer		Sheet No.	1. Time of Interview (Enter actual time)	2. Type of vehicle			
Date of Interview						1	Long Boat	6	Barge
Weather		Name of supervisor				2	Pan Toon	7	Oil Tanker
Direction						3	Motor Launch	8	Others
–						4	Speed Boat		
						5	Tug Boat		

Model of the vessel		5. Origin	6. Destination	7. Trip purpose		Passenger		Goods			13. Average travel time	14. Major points en route
3. Model/ Make	4. Age	Name of the place where you start the trip	Name of the place where you finally finish the trip	1	Home-Work place	8. Capacity (No. of persons)	9. No. of Passengers aboard	10. Loading Capacity (tons)	11. Type of Commodities carried	12. Weight of the Commodities (tons)		Name of route or municipality en route
				2	Work							
				3	To Home							
				4	Social Intercourse, recreation							
				5	Others							

1. Time	2. Type of vessel	3. Model/make of the vehicle	4. Age	5. Origin	6. Destination	7. Trip purpose	8. Capacity	9. No. of pass.	10. Loading capacity	11. Type of commodities carried	12. Weight	13. Average travel time	14. Major points en route

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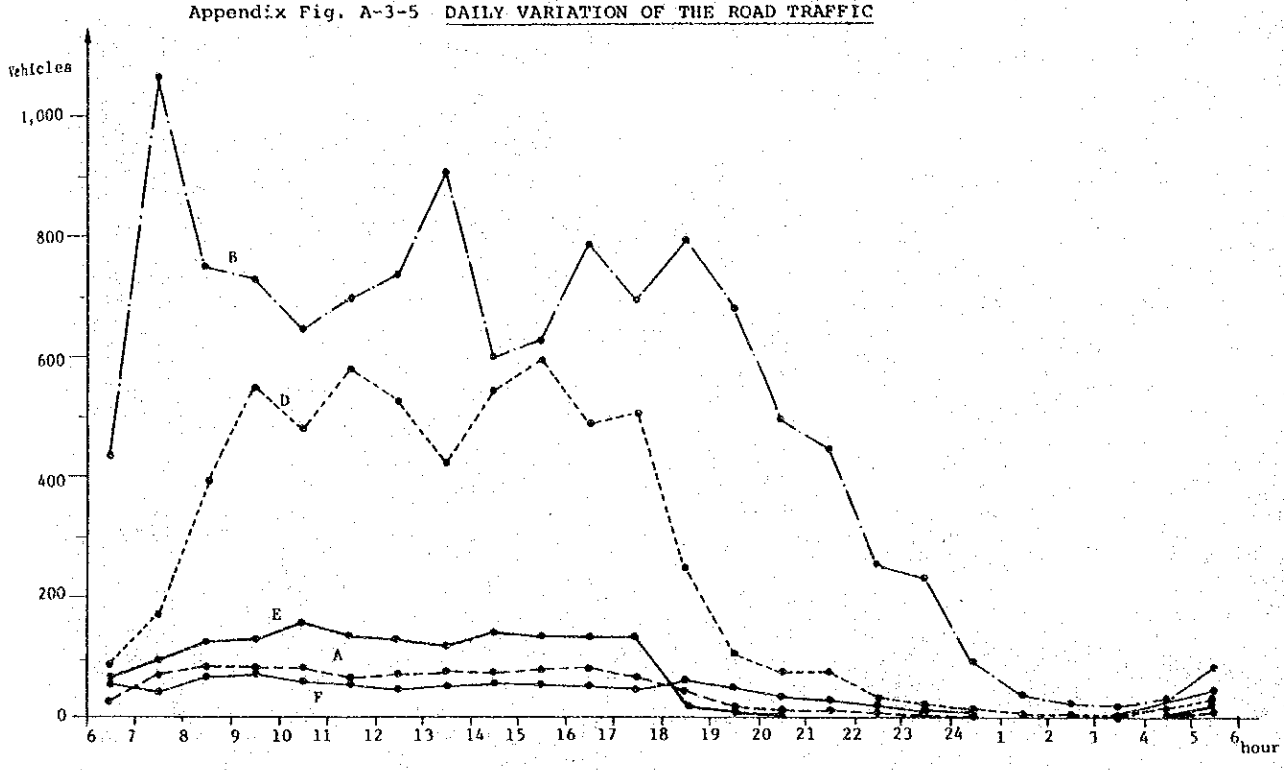
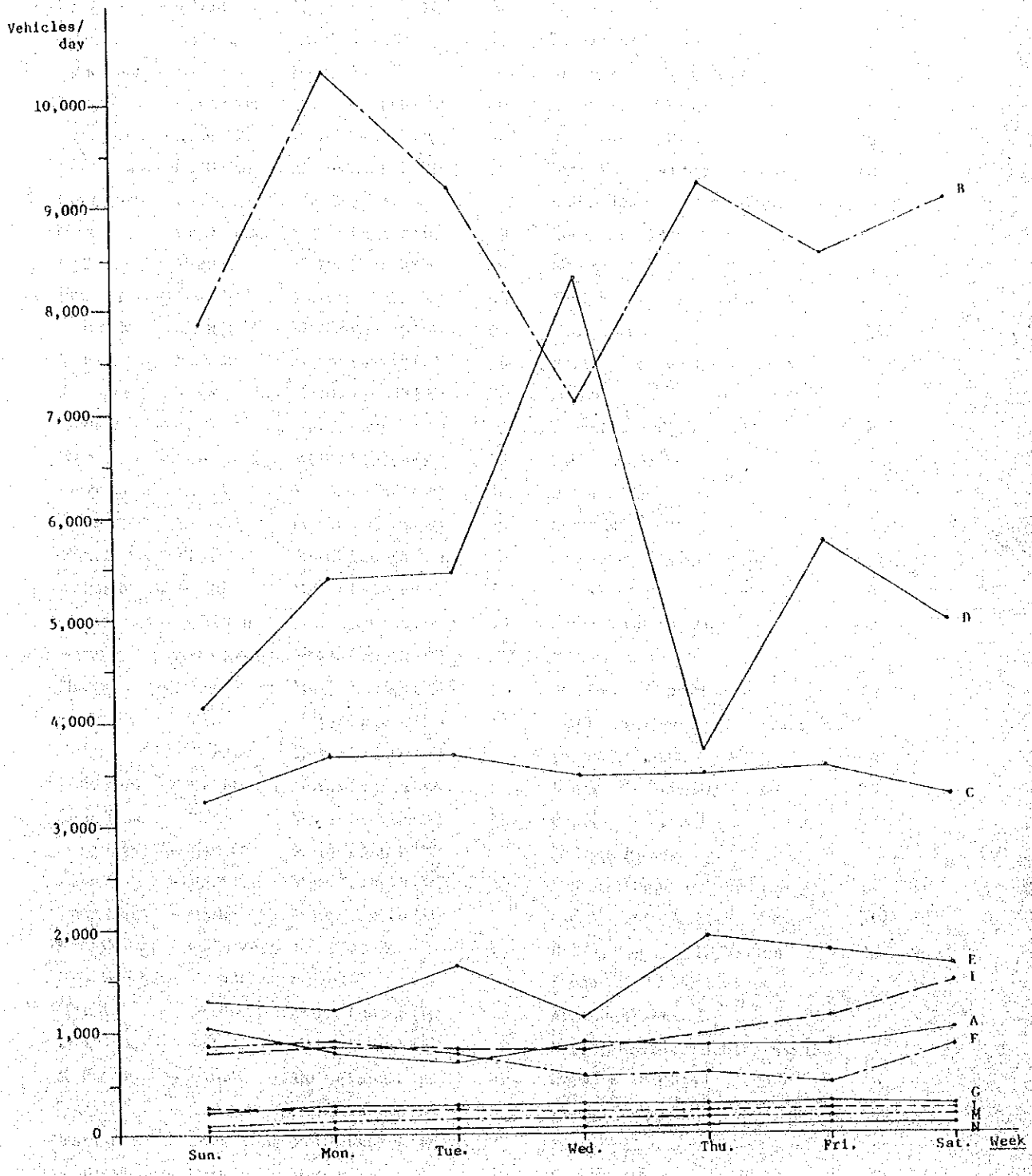
BELURU/LONG LAMA/LIMBANG ROAD PROJECT

Appendix Fig. A-3-5 DAILY VARIATION OF THE ROAD TRAFFIC



Appendix Fig. A-3-6 WEEKLY VARIATION OF ROAD TRAFFIC



Appendix Table A-3-1

SAMPLES OF RIVER CARGO TRAFFIC CHARACTERISTICS

Origin	– Destination	Type of Vessel 1/	Loading Capacity (ton)	Commodities and Weight	Travel Time (hr.)
Kuching	– Marudi	Motor Launch (W)	100	General cargo – 80 ton	6 (days)
Sibu	– Marudi	Oil Tanker (S)	150	Fuel (Diesel) – 150 ton	2 (days)
Long Lama	– Miri	Barge (S)	450	Stone – 300 ton	13
Marudi	– Long Lama	Motor Launch (W)	60	Sugar, Salt, Kerosine	8
Long Lama	– K. Baram	Motor Launch (W)	60	Pigs, Rubber, Rice	20
Long Lama	– K. Baram	Motor Launch (W)	30	Rice, Wood, Rubber – 6 ton	10
Long Lama	– K. Baram	Tug Boat (S)	–	Pulling logs – 10,000 ton	30
Marudi	– Long Lama	Motor Launch (W)	30	Sugar, Fertilizer	11
K. Baram	– Marudi	Motor Launch (W)	30	Diesel – 30 ton	8
Long Lama	– Marudi	Motor Launch (W)	30	Rottan – 20 ton	10
K. Baram	– Marudi	Motor Launch (W)	60	Bricks, Wire	7
K. Baram	– Marudi	Motor Launch (S)	20	Sugar, Rice, Cement – 20 ton	7
K. Baram	– Tinjar	Motor Launch (W)	30	Diesel	14
Marudi	– Tutoh	Motor Launch (W)	2	Biscuits, Drink	8
Marudi	– Long Teru	Motor Launch (W)	15	Salt, Rubber, etc.	5
Long Ikang	– Marudi	Motor Launch (W)	30	Banana, Pigs	5
K. Baram	– Marudi	Motor Launch (W)	30	Car, Rice	7
Marudi	– Tinjar	Motor Launch (W)	30	Vegetable, Drinks, etc.	11
K. Baram	– Marudi	Motor Launch (W)	50	Oil, Plywood	9
Marudi	– K. Baram	Motor Launch (W)	50	Rubber, Pepper, Rice	9
Marudi	– Asampaya	Motor Launch (W)	5	Rubber, Drink	7
Marudi	– Long Tutoh	Motor Launch (W)	10	Oil, Drink, Cement	10
Tinjar	– Marudi	Motor Launch (W)	12	Rubber, Pepper, Paddy – 1 ton	7
Marudi	– Bemang	Motor Launch (W)	3	Paddy, Fertilizer – 1 ton	5
Long Teru	– Marudi	Motor Launch (W)	15	Rottan, Belian wood – 5 ton	7
Long Teru	– Marudi	Motor Launch (W)	30	Pepper – 1 ton	6
Long Ikang	– Marudi	Motor Launch (W)	8	Rubber, Banana	5
Long Teru	– Marudi	Motor Launch (W)	30	Rubber, Pepper – 0.5 ton	7
Long Lama	– Marudi	Motor Launch (W)	2	Food, Paddy, Rubber – 2 ton	8
Batu Gading	– K. Baram	Tug Boat (W)	–	Pulling logs – 10,000 ton	12
Batu Gading	– Marudi	Barge (S)	30	Stone – 12 ton	7
Marudi	– Bakong	Motor Launch (W)	3	Biscuits, Drinks	6
Long Ikang	– Marudi	Motor Launch (W)	10	Pepper, Banana, Rubber – 1.5 ton	7
K. Baram	– Marudi	Motor Launch (S)	40	Diesel – 15 ton	6
Marudi	– K. Apoh	Motor Launch (S)	25	Wire – 1 ton	8
Marudi	– Long Lama	Motor Launch (W)	20	Rice, Drink	8
K. Baram	– Marudi	Motor Launch (W)	30	Pigs, Fertilizer – 5ton	7

Source : Interview survey conducted by consultant.

1/ W : Made of wood
S : Made of steel

Appendix Table A-3-2 AIR TRAFFIC, MIRI

Passenger (person), Cargo (ton) (per month)

Incoming (FROM)		K. L.	Singapore	Tawau	Sandakan	K/K	Labuan	Bander Serigawan	Bintulu	Sibu	Kuching	Long Semado	Lawas	Limbang	Bario	Long Seridan	Marudi	Mukah	Total
1973	Pass.	–	–	18	54	333	96	320	300	1,413	1,235	0	88	169	22	0	240	63	4,351
	Cargo	–	–	–	–	184	25	109	489	375	5,777	24	219	347	9	5	186	19	7,768
1974	Pass.	–	–	79	53	479	162	346	308	1,450	1,624	–	99	217	14	1	201	114	5,147
	Cargo	–	–	–	5	236	62	323	144	715	9,745	–	156	432	–	–	225	11	12,054
1975	Pass.	–	–	23	23	504	226	318	435	1,688	1,638	–	90	241	12	1	226	115	5,540
	Cargo	–	–	12	11	770	82	286	161	1,322	10,616	–	205	501	35	2	271	4	14,278
1976	Pass.	–	–	–	–	645	290	–	454	2,330	2,031	–	117	382	12	2	223	95	6,581
	Cargo	–	–	–	24	289	56	–	229	738	8,716	0	188	496	–	–	258	15	11,009
1977	Pass.	131	214	43	36	562	304	–	514	2,314	2,067	–	70	404	10	1	236	81	6,987
	Cargo	3,985	140	2	33	12,608	255	–	797	710	16,980	–	325	1,523	29	1	528	45	37,963
1978	Pass.	112	–	–	–	710	326	–	667	2,272	2,246	–	124	484	9	–	330	100	7,392
	Cargo	2,605	–	–	–	16,981	76	–	174	438	22,748	–	177	526	–	–	289	16	44,030

Outgoing (FOR)		K. L.	Singapore	Tawau	Sandakan	K/K	Labuan	Bander Serigawan	Bintulu	Sibu	Kuching	Long Semado	Lawas	Limbang	Bario	Long Seridan	Marudi	Mukah	Total
1973	Pass.	–	–	32	71	383	48	366	227	1,383	1,202	0	63	186	26	1	238	59	4,285
	Cargo	–	–	–	1	182	25	63	224	298	1,502	–	349	820	–	–	581	–	4,045
1974	Pass.	–	–	40	82	420	160	365	304	1,602	1,530	1	63	204	22	0	181	99	5,073
	Cargo	–	–	16	4	219	152	85	389	420	1,438	–	503	1,092	3	–	749	20	5,090
1975	Pass.	–	–	30	47	409	211	362	383	1,591	1,502	1	68	220	33	1	182	87	5,127
	Cargo	–	–	0	14	237	81	65	485	751	1,951	5	531	1,087	23	0	713	72	6,015
1976	Pass.	30	237	60	44	514	286	–	484	2,345	1,800	5	96	344	24	2	218	79	6,568
	Cargo	264	230	2	31	193	86	–	477	448	2,037	–	335	1,207	1	0	677	30	6,018
1977	Pass.	85	–	–	–	675	332	–	532	2,308	2,139	0	107	444	10	–	289	100	7,021
	Cargo	830	–	–	–	1,418	71	–	153	554	10,468	–	182	689	19	–	295	19	14,698
1978	Pass.	62	237	42	27	671	319	–	609	2,464	1,771	–	64	420	20	1	267	78	7,052
	Cargo	1,685	109	–	–	1,538	265	–	902	535	1,413	–	398	1,653	–	–	670	25	14,193

Source: Dept. of Civil Aviation

Appendix Table A-3-3 AIR TRAFFIC, MARUDI

(per month)

Incoming (FROM)		Miri	Bario	Long Seridan	Total
1974	Pass.	189	51	16	256
	Cargo	1.14	1.79	1.30	4.23
1975	Pass.	211	48	15	274
	Cargo	1.93	2.12	0.96	5.01
1976	Pass.	227	52	19	298
	Cargo	3.12	3.16	1.50	7.78
1977	Pass.	263	40	15	318
	Cargo	2.98	2.69	0.96	6.63

Outgoing (FOR)		Miri	Bario	Long Seridan	Total
1974	Pass.	197	55	18	270
	Cargo	0.39	2.91	0.93	4.23
1975	Pass.	229	53	16	298
	Cargo	0.98	2.30	1.01	4.29
1976	Pass.	241	51	21	313
	Cargo	1.89	3.68	0.98	6.55
1977	Pass.	293	49	17	359
	Cargo	2.38	2.53	1.27	6.18

Source: Dept. of civil aviation

Appendix Table A-3-4 AIR TRAFFIC, LIMBANG

(per month)

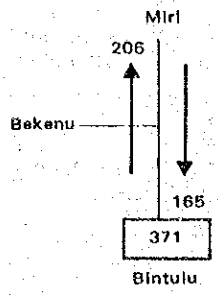
		Incoming Total	Outgoing Total
1974	Pass.	369	404
	Cargo	2,955	1,549
1975	Pass.	418	437
	Cargo	3,169	1,898
1976	Pass.	537	552
	Cargo	4,660	2,093
1977	Pass.	566	582
	Cargo	5,368	2,103
1978	Pass.	594	674
	Cargo	4,313	1,674

Source: Dept. of civil aviation

Appendix Table A-3-5 (1) RESULT OF ROAD TRAFFIC COUNT

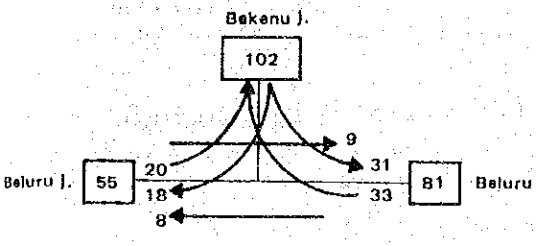
(Average of Two Days)

Miri-Bintulu road; Bekenu junction



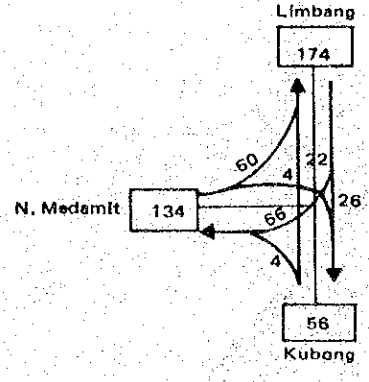
	Car Taxi	Van Pick-up	Truck	Bus	Total
No. of vehicle	179	60	122	10	371
Type of vehicle composition (%)	48.3	16.2	32.8	2.7	100

Beluru road; Peninjau junction



	Car Taxi	Van Pick-up	Truck	Bus	Total
No. of vehicle	38	22	57	2	119
Type of vehicle composition (%)	31.9	18.5	47.9	1.7	100

Limbang-N. Medamit road; Kubong junction



	Car Taxi	Van Pick-up	Truck	Bus	Total
No. of vehicle	80	42	36	24	182
Type of vehicle composition (%)	43.9	23.1	19.8	13.2	100

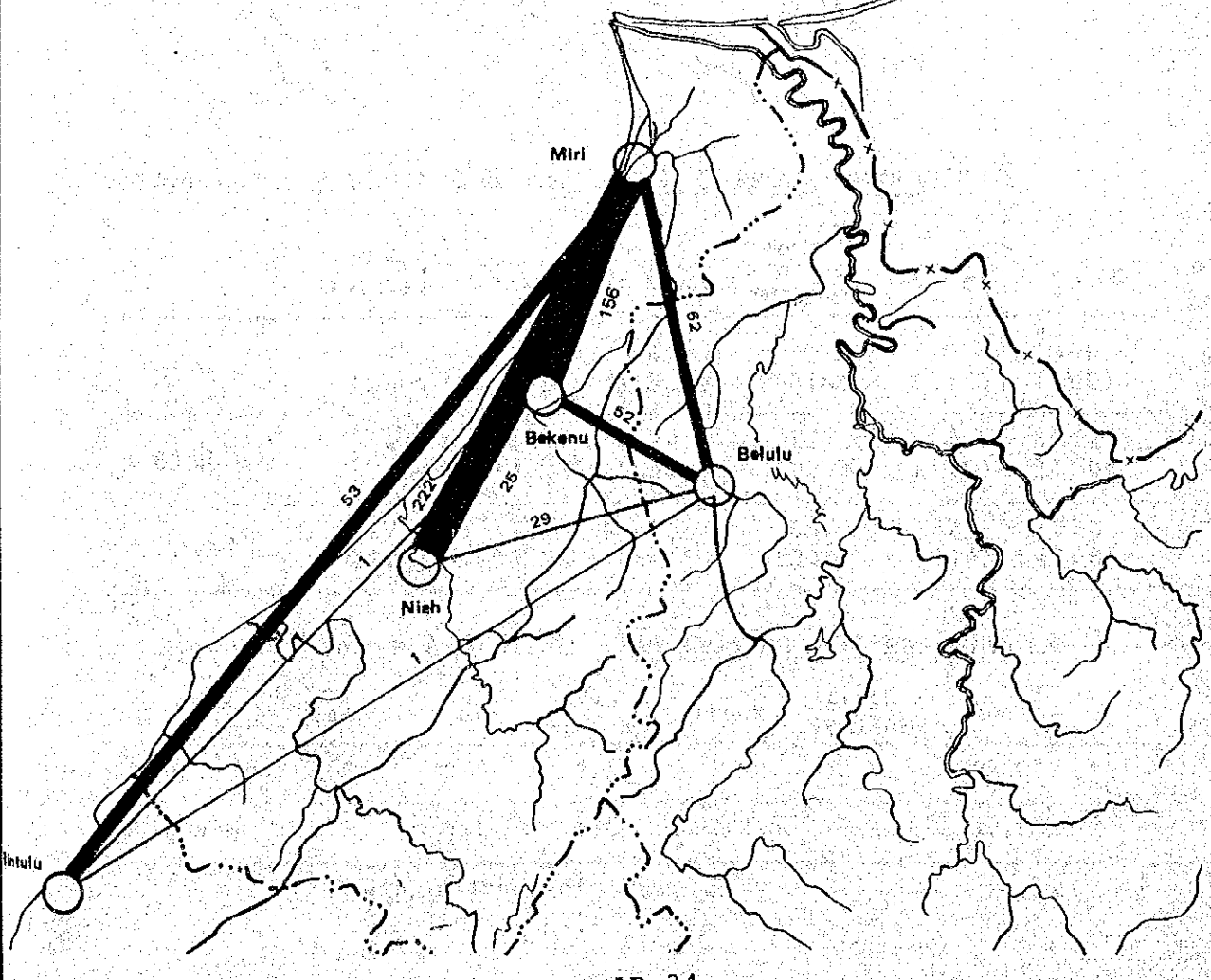
Appendix Table A-3-5 (2)
SAMPLE RATE OF ROAD SIDE INTERVIEW SURVEY

(%)

Survey post	Date	No. of vehicle	No. of Sample	Sample Rate
1 Miri-Bintulu road (Bekenu junction)	27 July	374	185	49.5
	28 July	368	219	59.5
2 Beluru road (Peninjau junction)	27 July	121	104	86.0
	28 July	115	112	97.4
Miri Total	-	978	620	63.4
3 Limbang-N.Medamit road (Kubong junction)	01 Aug.	182	163	89.6
	02 Aug.	180	165	91.7
Limbang Total	-	362	328	90.6

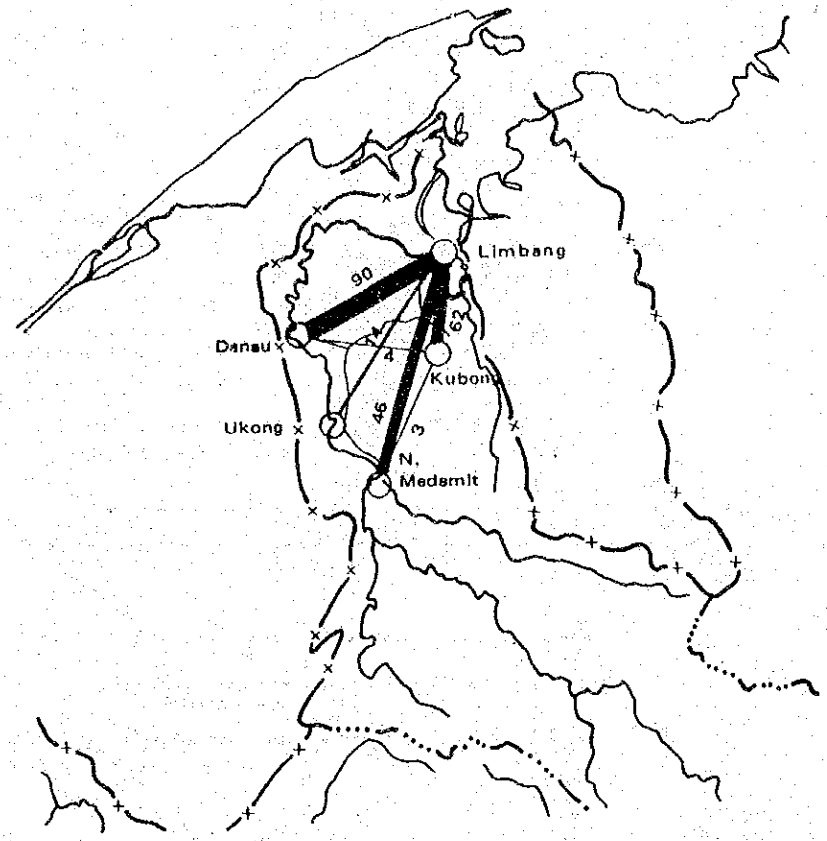
Appendix Fig. A-3-7 (1) CAR TRAFFIC DESIRED LINE

(Vehicle/day)



Appendix Fig. A-3-7 (2) CAR TRAFFIC DESIRED LINE

(vehicle/day)



Appendix Table A-3-5 (3) TRIP PURPOSE COMPOSITION

( ) : %

	Home Work Place	Work	To Home	Social intercourse recreation	Others	Total
Miri	3 (1.0)	185 (59.9)	49 (15.9)	52 (16.8)	20 (6.4)	309 (100)
Limbang	14 (7.2)	143 (73.7)	24 (12.4)	11 (5.7)	2 (1.0)	194 (100)
Total	17 (3.4)	328 (65.2)	73 (14.5)	63 (12.5)	22 (4.4)	503 (100)

Appendix Table A-3-5 (4) AVERAGE NO. OF PASSENGERS

	Car	Taxi	Van Pick-up	Truck	Truck Trailer	Bus 1/
Miri	3.6	3.5	3.1	3.9	2.0	22.6
Limbang	3.9	3.1	3.4	3.2	1.4	13.9

1/ Excluding driver and conductor

Appendix Table A-4-1 MAIN IMPORT OF COMMODITY ITEMS/GROUP AT THE PORTS OF MARUDI AND LIMBANG, 1977

TONS

Commodity Group/Item	MARUDI EXTERNAL A)	MARUDI INTERNAL 1/B)	LIMBANG EXTERNAL A)	LIMBANG INTERNAL B)
Food	262	1,600	345	620
Milled Wheat	132	110	108	60
Sugar	340	400	49	350
Beverages	89	150	69	80
Animal Feed	-	n.a.	267	n.a.
Fertilizer	-	n.a.	15	n.a.
Cement	844	1,100	1,729	200
Iron & Steel	301	400	67	350
Tobacco	3		17	
Crude Materials inedible except fuels	17		1,257	
Animal and Vegetable Oils	4	6,200	64	2,000
Chemicals and Products	30		58	
Other General Cargo	1,600		1,500	
Fuels	-	10,000	-	4,200
TOTAL	3,622	19,960	5,345	7,860

Source: A; Computer Output of external trade by port, Dept. of Statistics

b; Consultants' estimates based on the results of interview survey etc.

1/ Includes Long Lama and Marudi

Appendix Table A-4-2 PER CAPITA CONSUMPTION OF GROUPED IMPORT ITEMS

	Commodity Group	Whole State (Sarawak) Average 1971-73	1974	1975	1976	Average 1974-76	Study Area 1/ (1977) Miri	Marudi	Limbang
	Food	65.87	72.29	72.77	47.47	64.18	64.23	5.44	14.00
042	Rice	63.49	78.87	33.53	57.12	56.51	0	0	0
08/081	Animal Feed	56.33	59.39	58.81	69.09	62.43	115.82	0	11.03
041	Wheat Flour	13.31	11.02	12.22	14.48	12.57	16.59	2.74	4.46
06	Sugar	22.75	24.35	23.97	25.36	24.56	45.03	7.05	2.02
11	Beverages	7.35	10.51	9.68	9.76	9.98	12.08	1.85	2.85
	Cement	86.24	88.76	100.88	112.22	100.62	206.18	17.51	63.18
56/561	Fertilizer	31.69	37.12	31.10	29.15	32.46	126.59	0	0
67	Iron & Steel	37.06	44.11	44.23	53.25	47.20	120.78	6.24	2.77
	Mis. Gen. Cargo	157.37	289.55	167.30	n.a.	228.43	591.98	24.90	61.98
	Total	541.46	715.97	554.49	n.a.	638.94	1,299.28	65.73	162.29

1/ Imports from outside Sarawak only

Appendix Table A-4-3

TIME DISTANCE OF EACH ZONE PAIR VIA ROAD

hr.

		2 Bekenu	3 Niah	4 Bintulu	5 Bakong	6 Tinjar	7 Lower Baram	8 Baram Middle	9 Upper Middle	10 Tutoh/ Apoh	11 N. Medamit	12 Limbang
1	Miri	0.95	1.70	3.38	1.14	1.88	-	2.37	-	3.44	4.55	5.19
	2		1.25	2.93	0.69	1.43	-	1.92	-	2.99	4.10	4.74
	3			2.00	1.10	1.84	-	2.33	-	3.40	4.51	5.15
	4				2.78	3.52	-	4.01	-	5.08	6.19	6.83
	5					0.74	-	1.23	-	2.30	3.41	4.05
	6						-	0.49	-	1.56	2.67	3.31
	7							-	-	-	-	-
	8								-	1.07	2.18	2.82
	9									-	-	-
	10										1.11	1.75
	11											0.64

Appendix Table A-4-4

DISTANCE OF EACH ZONE PAIR VIA ROAD

km.

		2 Bekenu	3 Niah	3 Bintulu	5 Bakong	6 Tinjar	7 Lower Baram	8 Baram Middle	9 Upper Middle	10 Tutoh/ Apoh	11 N. Medamit	12 Limbang	13 Brunei
1	Miri	58	102	202	69	107	-	132	-	187	244	285	153
	2		76	176	43	81	-	106	-	161	218	259	211
	3			120	67	105	-	130	-	185	242	283	255
	4				167	205	-	230	-	285	342	283	355
	5					38	-	63	-	118	175	216	222
	6						-	25	-	80	137	178	-
	7							-	-	-	-	-	-
	8								-	55	112	153	-
	9									-	-	-	-
	10										57	98	-
	11											41	-
	12												-

Appendix Table A-4-5 ESTIMATE OF VEHICLE OPERATING COSTS

Appendix Table A-4-5 (1) OPERATING CHARACTERISTICS OF VEHICLES

Appendix Table A-4-5 (2) VEHICLE OPERATING COST (WITH TAXES)

Appendix Table A-4-5 (3) VEHICLE OPERATING COST (WITHOUT TAXES)

Appendix Table A-4-5 (4) PRICE OF REPRESENTATIVE VEHICLE, 1978

Appendix Table A-4-5 (5) PRICE OF BODY, 1978

Appendix Table A-4-5 (6) FUEL CONSUMPTION

Appendix Table A-4-5 (7) PRICE OF FUEL, 1978

Appendix Table A-4-5 (8) OIL CONSUMPTION

Appendix Table A-4-5 (9) PRICE OF OIL, 1978

Appendix Table A-4-5 (10) TYRE WEAR (LIFE KILOMETRAGE)

Appendix Table A-4-5 (11) PRICE OF A SET OF TYRES, 1978

Appendix Table A-4-5 (12) MAINTENANCE: PARTS

Appendix Table A-4-5 (13) MAINTENANCE: LABOUR

Appendix Table A-4-5 (14) AVERAGE MONTHLY WAGES OF DRIVERS AND ASSISTANTS

Appendix Table A-4-5 (15) INSURANCE

Appendix Table A-4-5 (16) ROAD TAXES/FEES

Appendix Table A-4-5 (17) VEHICLE OPERATING COST

Appendix Table A-4-5 (1)

OPERATING CHARACTERISTICS OF VEHICLES

	Car			Van/Pick-up			Bus		
	Earth	Gravel	Paved	Earth	Gravel	Paved	Earth	Gravel	Paved
Life Years	3	4	5	4	5	6	5	6.5	8
Life Kilometrage (000)	28.8	64	96	57.6	96	144	240	416	640
Km/Year (000)	9.6	12.8	16	14.4	19.2	24	48	64	80
Operating Days/Year	-	-	-	-	-	-	300	320	340
Average Km/Day	-	-	-	-	-	-	160	200	260
Average Running Speed Km/Hour	40	56	80	40	55	70	30	37	48

	Medium Truck (6 Ton)			Heavy Truck I (10 Ton Truck)			Heavy Truck II (20 Ton Truck Trailer)		
	Earth	Gravel	Paved	Earth	Gravel	Paved	Earth	Gravel	Paved
Life Years	5	6	7	5	6	7	5	6.5	8
Life Kilometrage (000)	240	384	560	200	320	490	280	520	896
Km/Year (000)	48	64	80	40	53.3	70	56	80	112
Operating Days/Year	260	280	300	260	280	300	280	300	320
Average Km/Day	185	230	270	155	190	235	200	270	350
Average Running Speed Km/Hour	35	43	55	25	32	45	32	40	52

Appendix Table A-4-5 (2) VEHICLE OPERATING COST (WITH TAXES)

Cost Item	CAR			VAN/PICK-UP			BUS		
	Earth	Gravel	Paved	Earth	Gravel	Paved	Earth	Gravel	Paved
Depreciation	0.5047	0.2271	0.1514	0.4405	0.2643	0.1762	0.3304	0.1906	0.1239
Fuel Consumption	0.0752	0.0627	0.0502	0.1568	0.1254	0.0941	0.1018	0.0853	0.0688
Oil Consumption	0.0038	0.0031	0.0026	0.0045	0.0038	0.0033	0.0055	0.0046	0.0041
Tyre Wear	0.0262	0.0157	0.0079	0.0568	0.0316	0.0149	0.0644	0.0337	0.0177
Maintenance; Parts	0.0262	0.0189	0.0160	0.0660	0.0431	0.0304	0.4758	0.2775	0.1586
; Labour	0.0045	0.0033	0.0026	0.0063	0.0040	0.0030	0.0226	0.0130	0.0080
Wages	-	-	-	-	-	-	0.2500	0.1875	0.1500
Insurance	0.0371	0.0278	0.0222	0.0571	0.0428	0.0343	0.0229	0.0172	0.0138
License/Fees	0.0155	0.0116	0.0093	0.0235	0.0177	0.0141	0.0094	0.0070	0.0056
Overhead	0.0693	0.0370	0.0267	0.0812	0.0533	0.0370	0.1283	0.0816	0.0551
Total	0.7625	0.4072	0.2884	0.8927	0.5860	0.4073	1.4111	0.8980	0.6056

Cost Item	Medium Truck (6 Ton)			Heavy Truck I (10 Ton)			Heavy Truck II (20 Ton T. Trailer)		
	Earth	Gravel	Paved	Earth	Gravel	Paved	Earth	Gravel	Paved
Depreciation	0.2253	0.1408	0.0966	0.3818	0.2386	0.1558	0.6130	0.3301	0.1916
Fuel Consumption	0.1018	0.0853	0.0688	0.1458	0.1100	0.0825	0.2200	0.1650	0.1238
Oil Consumption	0.0055	0.0046	0.0041	0.0117	0.0097	0.0085	0.0166	0.0138	0.0120
Tyre Wear	0.1745	0.0914	0.0480	0.3875	0.2022	0.1033	0.6975	0.3639	0.1860
Maintenance; Parts	0.1893	0.1352	0.1082	0.3436	0.2367	0.1909	0.5149	0.3261	0.2574
; Labour	0.0226	0.0130	0.0080	0.0250	0.0150	0.0100	0.0361	0.0208	0.0128
Wages	0.2000	0.1500	0.1200	0.3300	0.2477	0.1886	0.3429	0.2400	0.1714
Insurance	0.0258	0.0193	0.0155	0.0446	0.0334	0.0255	0.0707	0.0495	0.0354
License/Fees	0.0098	0.0073	0.0059	0.0155	0.0116	0.0089	0.0188	0.0131	0.0094
Overhead	0.0955	0.0647	0.0475	0.1686	0.1105	0.0774	0.2531	0.1522	0.1000
Total	1.0501	0.7116	0.5226	1.8541	1.2154	0.8514	2.7836	1.6745	1.0998

Appendix Table A-4-5 (3) VEHICLE OPERATING COST (WITHOUT TAXES)

Cost Item	CAR			VAN/PICK-UP			BUS		
	Earth	Gravel	Paved	Earth	Gravel	Paved	Earth	Gravel	Paved
Depreciation	0.4167	0.1875	0.1250	0.3734	0.2241	0.1494	0.2703	0.1560	0.1014
Fuel Consumption	0.0407	0.0339	0.0271	0.0848	0.0678	0.0509	0.1018	0.0853	0.0688
Oil Consumption	0.0034	0.0028	0.0024	0.0041	0.0034	0.0030	0.0050	0.0042	0.0037
Tyre Wear	0.0231	0.0139	0.0069	0.0500	0.0278	0.0132	0.0566	0.0297	0.0156
Maintenance; Parts	0.0216	0.0156	0.0132	0.0559	0.0366	0.0258	0.3893	0.2271	0.1298
; Labour	0.0041	0.0030	0.0023	0.0057	0.0036	0.0027	0.0203	0.0117	0.0072
Wages	-	-	-	-	-	-	0.2250	0.1688	0.1350
Insurance	0.0297	0.0222	0.0178	0.0457	0.0343	0.0274	0.0183	0.0138	0.0110
Overhead	0.0539	0.0279	0.0195	0.0620	0.0398	0.0272	0.1087	0.0697	0.0473
Total	0.5932	0.3068	0.2142	0.6816	0.4374	0.2996	1.1953	0.7663	0.5198

Cost Item	MEDIUM TRUCK (6 Ton)			HEAVY TRUCK I (10 Ton)			HEAVY TRUCK II (20 Ton T. Trailer)		
	Earth	Gravel	Paved	Earth	Gravel	Paved	Earth	Gravel	Paved
Depreciation	0.1735	0.1084	0.0744	0.2855	0.1785	0.1165	0.4880	0.2628	0.1525
Fuel Consumption	0.1018	0.0853	0.0688	0.1458	0.1100	0.0825	0.2200	0.1650	0.1238
Oil Consumption	0.0050	0.0042	0.0037	0.0106	0.0088	0.0077	0.0151	0.0125	0.0109
Tyre Wear	0.1536	0.0805	0.0423	0.3410	0.1779	0.0909	0.6138	0.3203	0.1637
Maintenance; Parts	0.1457	0.1041	0.0833	0.2570	0.1770	0.1428	0.4099	0.2596	0.2050
; Labour	0.0203	0.0117	0.0072	0.0225	0.0135	0.0090	0.0325	0.0187	0.0115
Wages	0.1800	0.1350	0.1080	0.2970	0.2229	0.1697	0.3086	0.2160	0.1543
Insurance	0.0206	0.0155	0.0124	0.0356	0.0267	0.0204	0.0566	0.0396	0.0283
Overhead	0.0801	0.0545	0.0400	0.1395	0.0915	0.0640	0.2145	0.1295	0.0850
Total	0.8806	0.5992	0.4401	1.5345	1.0068	0.7035	2.3590	1.4240	0.9350

Appendix Table A-4-5 (4)
PRICE OF REPRESENTATIVE VEHICLE, 1/

Vehicle Type	Average Market Price	Duty, Surtax Sales Tax	Price Without Taxes
1. Car (Toyota Corolla)	14,770	2,560	12,210
2. Van/Pick-up (Toyota Land Cruiser)	25,940	3,930	22,010
3. Medium Truck 2/ (Toyota 6 Ton)	45,000	11,020	33,980
4. Heavy Truck I (Isuzu 10 Ton)	81,000	19,800	61,200
5. Heavy Truck II (Nissan 20 Ton)	180,000	36,000	144,000
6. Bus 2/ (Bedford)	50,000	10,000	40,000

1/ Including tyres
2/ Excluding body

Appendix Table A-4-5 (5) PRICE OF BODY, 1978

Vehicle Type	Market Price	Tax	Price Without Tax
Medium Truck	11,000	1,650	9,350
Bus	30,000	4,500	25,500

Source: Interviews with dealers

Appendix Table A-4-5 (6) FUEL CONSUMPTION

Liter/1,000km

Vehicle Type	Road Type		
	Earth	Gravel	Paved
Car	120	100	80
Van/Pick-up	250	200	150
Medium Truck	370	310	250
Heavy Truck I	530	400	300
Heavy Truck II	800	600	450
Bus	370	310	250

Source: Quantification of Road User Savings, IBRD

Appendix Table A-4-5 (7) PRICE OF FUEL, 1978 1/

Fuel Type	Price, M$/Gallon (M$/Liter)	
	With Tax	Without Tax
Gasoline ; Super	3.45 (0.759)	2.08 (0.458)
; Regular	2.85 (0.627)	1.54 (0.339)
Diesel	1.25 (0.275)	1.25 (0.275)

Source: Interviews with dealers

1/ Average in Miri and Limbang areas

Appendix Table A-4-5 (8) OIL CONSUMPTION

Liter/1,000km

Vehicle Type	Road Type		
	Earth	Gravel	Paved
Car	1.6	1.3	1.1
Van/Pick-up	1.9	1.6	1.4
Medium Truck	3.1	2.6	2.3
Heavy Truck I	6.6	5.5	4.8
Heavy Truck II	9.4	7.8	6.8
Bus	3.1	2.6	2.3

Appendix Table A-4-5 (9) PRICE OF OIL, 1978

Oil Type	Price, M$/Gallon (M$/Liter)	
	With Tax	Without Tax
For Gasoline Engine	10.75 (2.365)	9.75 (2.145)
For Diesel Engine	8.05 (1.771)	7.30 (1.606)

Appendix Table A-4-5 (10) TYRE WEAR (LIFE KILOMETRAGE)

000km

Vehicle Type	Road Type		
	Earth	Gravel	Paved
Car	9	15	30
Van/Pick-up	10	18	38
Medium Truck	11	21	40
Heavy Truck I	12	23	45
Heavy Truck II	12	23	45
Bus	11	21	40

Appendix Table A-4-5 (11) PRICE OF A SET OF TYRES, 1978

Vehicle Type	Tyre Type	No. of Tyres	Price (M$) With Tax	Price (M$) Without Tax
Car	615 x 13	4	236	208
Van/Pick-up	750 x 16	4	568	500
Medium Truck	825 x 20	6	1,920	1,690
Heavy Truck I	1,000 x 20	10	4,650	4,092
Heavy Truck II	1,000 x 20	18	8,370	7,366
Bus	670 x 13	6	708	623

Appendix Table A-4-5 (12) MAINTENANCE: PARTS

Vehicle Type	% of Depreciable Value per 1,000km		
	Earth	Gravel	Paved
Car	0.18	0.13	0.11
Van/Pick-up	0.26	0.17	0.12
Medium Truck	0.35	0.25	0.20
Heavy Truck I	0.45	0.31	0.25
Heavy Truck II	0.30	0.19	0.15
Bus	0.60	0.35	0.20

Appendix Table A-4-5 (13) MAINTENANCE: LABOUR 1/

Vehicle Type	Hours per 1,000km		
	Earth	Gravel	Paved
Car	1.13	0.83	0.66
Van/Pick-up	1.58	1.00	0.76
Medium Truck	5.64	3.24	2.00
Heavy Truck I	6.25	3.75	2.50
Heavy Truck II	9.03	5.19	3.20
Bus	5.64	3.24	2.00

1/ Hourly Cost of Labour:

$$\frac{\$600/\text{Month}}{150\text{hrs/Month}} = \$4.0/\text{hr.}$$

Appendix Table A-4-5 (14)
AVERAGE MONTHLY WAGES OF DRIVERS AND ASSISTANTS 1/

M$/Month

Vehicle Type	Driver	Assistant
Medium Truck	500	300
Heavy Truck I	800	300
Heavy Truck II	1,000	300 x 2
Bus	700	300

1/ Including trip allowances and other fringe benefits.

Appendix Table A-4-5 (15) INSURANCE

M$/Year

Vehicle Type	With Tax	Without Tax
Car	355.9	284.7
Van/Pick-up	822.6	658.1
Medium Truck	1,236.0	988.8
Heavy Truck I	1,782.0	1,425.6
Heavy Truck II	3,960.0	3,168.0
Bus	1,100.0	880.0

Appendix Table A-4-5 (16) ROAD TAXES/FEES

Vehicle Type	Amount (M$/Year)
Car	149.0
Van/Pick-up	339.0
Medium Truck	470.0
Heavy Truck I	620.0
Heavy Truck II	1,050.0
Bus	450.0

Appendix Table A-4-5 (17) VEHICLE OPERATING COST

(M$/veh.km.)

Vehicle Type	(Taxes)	Level tangent				Gradient (1/2) 0 ∿ 3% (1/2) 0 ∿ 5%		
		Earth	Gravel	(1/2)Gravel (1/2)Paved	Paved	Gravel	(1/2)Gravel (1/2)Paved	Paved
Car	(WITH)	0.7625	0.4072	0.3478	0.2884	0.4276	0.3652	0.3028
	(WITHOUT)	0.5932	0.3068	0.2605	0.2142	0.3221	0.2735	0.2249
Truck 6ton	(WITH)	1.0501	0.7116	0.6171	0.5226	0.9002	0.7806	0.6611
	(WITHOUT)	0.8806	0.5992	0.5197	0.4401	0.7580	0.6574	0.5567
10ton	(WITH)	1.8541	1.2154	1.0334	0.8514	1.5375	1.3073	1.0770
	(WITHOUT)	1.5345	1.0068	0.8552	0.7035	1.2736	1.0818	0.8899
20ton	(WITH)	2.7836	1.6745	1.3872	1.0998	2.1182	1.7548	1.3912
	(WITHOUT)	2.3590	1.4240	1.1795	0.9350	1.8014	1.4921	1.1828
BUS	(WITH)	1.4111	0.8980	0.7518	0.6056	1.1360	0.9510	0.7661
	(WITHOUT)	1.1953	0.7663	0.6431	0.5198	0.9694	0.8135	0.6575

Appendix Table A-4-6 ESTIMATE OF VESSEL OPERATING COSTS

Appendix Table A-4-6 (1) OPERATING CHARACTERISTICS OF LIGHT VESSELS

Appendix Table A-4-6 (2) OPERATING COST OF TUG BOAT

Appendix Table A-4-6 (3) OPERATING COST OF TUG (120 HP) and MOTOR VESSEL (40 TON)

Appendix Table A-4-6 (4) OPERATING COST OF MOTOR VESSELS

Appendix Table A-4-6 (5) OPERATING COST OF BARGE

Appendix Table A-4-6 (6) OPERATING CHARACTERISTICS OF PASSENGER EXPRESS LAUNCH

Appendix Table A-4-6 (7) OPERATING COST OF PASSENGER EXPRESS LAUNCH

Appendix Table A-4-6 (8) OPERATING CHARACTERISTICS OF LONG BOATS

Appendix Table A-4-6 (9) PRICE OF HULL

Appendix Table A-4-6 (10) PRICE OF OUTBOARD ENGINE

Appendix Table A-4-6 (11) OPERATING COST OF LONG BOAT WITH OUTBOARD ENGINE

Appendix Table A-4-6 (12) COST OF LOG RAFTING

Appendix Table A-4-6 (1) OPERATING CHARACTERISTICS OF LIGHT VESSELS

	Tug Boat				Barge (Tons)			Motor Vessel (Tons)		
	120HP	150HP	500HP	800HP	150	300	500	40	150	200
Loading Capacity	-	-	-	-	150	300	500	40	150	200
Ave. Operat. Speed(KPH)	8.0	8.0	9.0	9.0	8.0	8.0	8.0	11	12.5	13.5
Operating Hours/Day	10	10	10	10	14	14	14	10	24	24
Ave. Line Haul/Day(Km)	80	80	90	90	112	112	112	110	300	324
Operat. Days/Year	240	240	240	240	230	210	180	200	200	180
Operat. Km./Year	19,200	19,200	21,600	21,600	25,760	23,520	20,160	22,000	60,000	58,320
Life Years	15	15	20	20	20	22	25	15	22	25

Source: Interviews with Shipping Companies

Appendix Table A-4-6 (2) OPERATING COST OF TUG BOAT

(M$/day)

	150HP		500HP		800HP	
	with	without	with	without	with	without
1. Depreciation						
	625,000	500,000	1,062,500	850,000	1,375,000	1,100,000
15 years 240 day/year						
Cost	173.61	138.89	221,35	177.08	286.46	229.17
2. Fuel 4 gallon/hr.=						
0.8 gallon/mile(80km/day)			1.2 gallon/mile(90km/day)		1.5 gallon/mile (90km/day)	
$1.61 gallon, $1.57/gallon						
Cost	64.40	62.80	108.68	105.98	135.84	132.47
3. Lubrication						
0.02 gallon/mile(80km/day)			0.02 gallon/mile(90km/day)		0.025 gallon/mile(90km/day)	
$11.30/gallon $11.0/gallon						
Cost	5.65	5.50	12.71	12.37	15.89	15.47
4. Maintenance						
Engine Hull	15,000/year	12,750	$30,000	$25,500	$40,000	$34,000
Cost	62.50	53.12	125.00	106.25	166.67	141.67
5. Crew						
Captain 1 7,000 Engineer - Hands 2 3,500		14,000	1 7,000 1 6,000 2 3,500		1 7,000 1 6,000 2 3,500	20,000
Cost	58.33	55.42	83.33	79.17	83.33	79.17
6. Stores	1,500/year		2,200/year		2,400/year	
Cost	6.25	5.94	9.17	8.71	10.00	9.50
7. Insurance	1% on value/days					
Cost	24.04	19.23	44.27	35.41	57.29	45.83
Sub-Total	394.78	340.90	604.51	524.97	755.48	653.28
8. Overhead	39.48	34.09	60.45	52.50	75.55	65.33
Total/Day	434.26	374.99	664.96	577.47	831.03	718.61

Appendix Table A-4-6 (3)

OPERATING COST OF TUG (120HP) AND MOTOR VESSEL (40 TON)

(M$/day)

	120HP TUG		40 TON Motor Vessel	
	(with)	(without)	(with)	(without)
1. Depreciation				
Engine	55,000	38,000	60,000	45,000
Hull	20,000	17,000	25,000	21,250
Engine	22.92	15.83	30.00	22.50
Hull	5.56	4.72	8.33	7.08
Total	28.48	20.55	38.33	29.58
2. Fuel	4 gallon/1hr = 0.8 gallon/mile		0.7 gallon/mile = 48 gallon/day	
	$1.61/gallon	$1.57/gallon		
Cost	64.40	62.80	77.28	75.36
3. Lubrication	every 250 mile, 10 gallons			
	0.04 gallons/mile			
	2 gallons/day			
	$11.30/gallon	$11.00/gallon		
Cost	11.30	11.00	13.56	13.20
4. Maintenance	Hull 1,000/year		Hull 4,000/year	
	Engine 2,000/year		Engine 7,000/year	
	3,000	2,550	11,000	9,350
Cost	12.50	10.63	55.00	46.75
5. Crew	Captain 1 x 5,000/year			
	Crew 3 x 3,500/year			
	Total 15,500/year		15,500/year	
Cost	64.58	61.35	77.50	73.63
6. Insurance	1% on value/days			
	3.13	2.29	4.25	3.31
Sub-total	184.39	168.62	265.92	241.83
7. Overhead	10% of sub-total			
	18.44	16.86	26.59	24.18
Total/Day	202.83	185.48	292.51	266.01

Appendix Table A-4-6 (4) OPERATING COST OF MOTOR VESSELS

(M$/day)

	200 Ton		150 Ton	
	with	without	with	without
	2,500,000	2,000,000	1,900,000	1,520,000
1. Depreciation	24hrs/day 8 mile/hr.= 12km/hr 180 day/year 288km/day 25 year life		200 day/year 22 years	
Cost	555.56	444.44	431.82	345.45
2. Fuel	18 gallon/hr 1.5 gallon/km 1.61/gallon $1.57/gallon		15 gallon/hr	
Cost	695.52	678.24	579.60	565.20
3. Lubrication	1/5 gallons/hr $11.30 $11.0		1/6 $11.30	
Cost	54.24	52.80	45.20	44.00
4. Maintenance	70,000		50,000	
Cost	388.89	311.11	250.00	200.00
5. Crew	Captain 8,000 Mate 7,000 Engineer 6,000 Hands 4 x 3,000 } 33,000		8,000 7,000 6,000 9,000 } 30,000	
Cost	183.33	164.70	150.00	135.00
6. Stores	$4,000/year		$3,000/year	
Cost	22.22	21.11	15.00	14.25
7. Insurance	1% on value/days			
Cost	138.89	111.11	95.00	76.00
Sub-Total	2,038.65	1,783.51	1,566.62	1,379.90
8. Overhead	203.87	178.35	156.66	137.99
Total/Day	2,242.52	1,951.86	1,723.28	1,517.89

Appendix Table A-4-6 (5) OPERATING COST OF BARGE

(M$/day)

	150 TON		300 TON		500 TON	
	with	without	with	without	with	without
1. Depreciation	Price New					
	253,000	190,000	416,000	312,000	613,000	460,000
Cost	55.0	41.30	90.04	67.53	136.22	102.22
2. Maintenance	7,000$/year		12,000$/year		17,000$/year	
Cost	30.43	24.35	57.14	45.71	94.44	75.56
3. Stores (Docking)	12.00	11.40	18.00	17.10	28.00	26.60
4. Crew Wages						
Captain 8,000/y x 1 Mates 7,000/y x 1 Hands 3,500/y x 2	22,000		15,000 14,000	29,000	15,000 28,000	43,000
Cost	95.65	86.09	138.10	124.29	238.89	215.00
5. Insurance	1% on value/days					
Cost	11.00	8.80	19.81	15.85	32.26	25.81
Sub-Total	204.08	171.94	323.09	270.48	529.81	445.19
Overhead 10%	20.41	17.19	32.31	27.05	52.98	44.52
Total/Day	224.49	189.13	355.40	297.53	582.79	489.71

Appendix Table A-4-6 (6)
OPERATING CHARACTERISTICS OF PASSENGER EXPRESS LAUNCH

	Distance; 65 miles K. Baram/Marudi	68 miles Marudi/L. Lama
Size of Hull	73' x 13.5'	n.a.
Loading Capacity (No. of Pass.)	120	70
Max. Cruising Speed (KPH)	38	30
Ave. Cruising Speed (KPH)	30	22
Operating Hours/Day	3.5	5.0
Operating Days/Year	350	240
Annual Kilometrage	36,750	26,400
Life Years	20	16
Life Kilometrage	735,000	422,400
Life Years of Engine	10	6

Appendix Table A-4-6 (7)

OPERATING COST OF PASSENGER EXPRESS LAUNCH

	Kuala Baram - Marudi		Marudi - Long Lama	
	300,000	219,000	180,000	137,250
		Tax		
Engine	80,000 x 2	50,000 x 2(37.5%)	Engine 70,000 x 1	43,750
Body	140,000	119,000 (15.0%)	Body 110,000	93,500
Dipreciation[1]				
Engine	45.7	28.6	Engine 48.6	30.4
Hull	20.0	17.0	Hull 28.6	24.3
Total	65.7	45.6	Total 77.2	54.7

1) Price/Life years/Days per year

Fuel				
Consumption	180 gallon/trip(51.4/hr)		120 gallon/trip(24.0/hr)	
Price of fuel	$1.61/gallon, $1.57/gallon			
Cost	289.8	261.0	193.2	174.0
Lubrication				
Consumption	1.5 gallon/trip		1.0 gallon/trip	
Price of L/O	$11.30/gallon, $11.0			
Cost	17.0	16.5	11.3	11.0
Maintenance				
Engine	$10,000/year		$6,000/year	
Hull	$2,000/year		$1,300/year	
Overhaul	$5,000/year		$3,000/year	
	$25,000/year		$20,000/year	
Cost	73.5	62.5	83.3	70.8
Crew				
Captain	$7,200/year		$7,200	
Crew(3)	$4,200/year x 3 = 12,600/year		x 2 = $8,400	
Total	$19,800		$15,600	
Cost	$19{,}800 \times \frac{350}{23 \text{days/month} \times 12} \times \frac{1}{350}$		$15{,}600 \times \frac{1}{240}$	
	71.7	68.1	65.0	61.8
Insurance	1% on value/days			
Cost	8.6	6.3	7.5	5.2
Sub-Total	526.3	460.0	437.5	378.0
Overhead	10% of Sub-total			
Cost	52.6	46.0	43.8	37.8
Total/Day	578.9	506.0	481.3	415.8

Appendix Table A-4-6 (8)
OPERATING CHARACTERISTICS OF LONG BOATS

	Long Boat		
	67' x 4'	45' x 2.5'	20' x 2'/16' x 1.75'/ 14' x 1.5'
Loading Capacity (No. of Passengers)	15-18	6-8	2-3
Life Years	5	4	4
Ave. Operating Speed	11.6	11.6	-
Ave. Life Kilometrage	30,000	24,000	-
Engine Type	40HP x 1	25HP x 1	-
Life Years of Engine	30 (18,000)	2.5 (15,000)	-

Appendix Table A-4-6 (9)
PRICE OF HULL

Boat Type	Price (M$) With Tax	Without Tax
67' x 4'	3,000	2,760
45' x 2.5'	1,800	1,656
16' x 1.75'	400	400

Appendix A-4-6 (10)
PRICE OF OUTBOARD ENGINE

Engine Type	Price (M$) With Tax	Without Tax
40 HP	2,500 (25%)	1,875
25 HP	1,450 (25%)	1,088

Appendix Table A-4-6 (11)
OPERATING COST OF LONG BOAT WITH OUTBOARD ENGINE

	67' x 4'		45' x 2.5'	
	Financial	Economic	Financial	Economic
Depreciation	Price New x 1/Life kilometrage			
Hull	0.1000	0.0920	0.0750	0.0690
Engine	0.1389	0.1042	0.0967	0.0725
Total	0.2389	0.1962	0.1717	0.1415
Fuel	4.5 gallons/hr./11.6		2.5 gallons/hr./11.6	
Mixed benzine	$4.1 gallons(L/Lama)	10% tax		
	$6.0 gallons(L/Akah)			
	$4.1 gallon	$3.69		
Cost	1.5905	1.4315	0.8836	0.7953
Lubrication	5% of fuel consumption			
Cost	0.0923	0.0830	0.0574	0.0517
Maintenance	3% of depreciable value/1000km			
Hull	0.0900	0.0828	0.0540	0.0497
Engine	0.0750	0.0497	0.0435	0.0326
Total	0.1650	0.1325	0.0975	0.0823
Total/Km.	2.0867	1.8432	1.2102	1.0708

Appendix Table A-4-6 (12) COST OF LOG RAFTING

1 Racket 100 logs
2 Rackets 200 logs

(1) Labour 6.5men x 8hrs/2rackets
M$4.0/hr
6.5 x 8.0 x 4.0 = $208/200 logs --- $1.04/log

(2) Ropes; 8ft/10g x M$0.35/ft = M$2.8/log
$250(1 roll) = 720ft --- $0.35/ft
M$2.8 x 1/2 times use = M$1.4/log

(3) Cable; 400ft/2rackets
400ft x M$5.50/ft = M$2,200/8 time life = M$275/200 logs

Tons	(350)	(700)	(1,400)	(2,800)	(3,500)
	100	200	400	800	1,000
No.logs(Rackets)	(1)	(2)	(4)	(8)	(10)
Labour	104	208	416	832	1,040
Ropes	140	280	560	1,120	1,400
Cable	138	275	413	689	827
Total	382	763	1,389	2,641	3,267
Inc. Overhead (20%)	458	916	1,667	3,169	3,920
Per log	4.58	4.58	4.17	3.96	3.92

1 H/T = 1.803m^3