

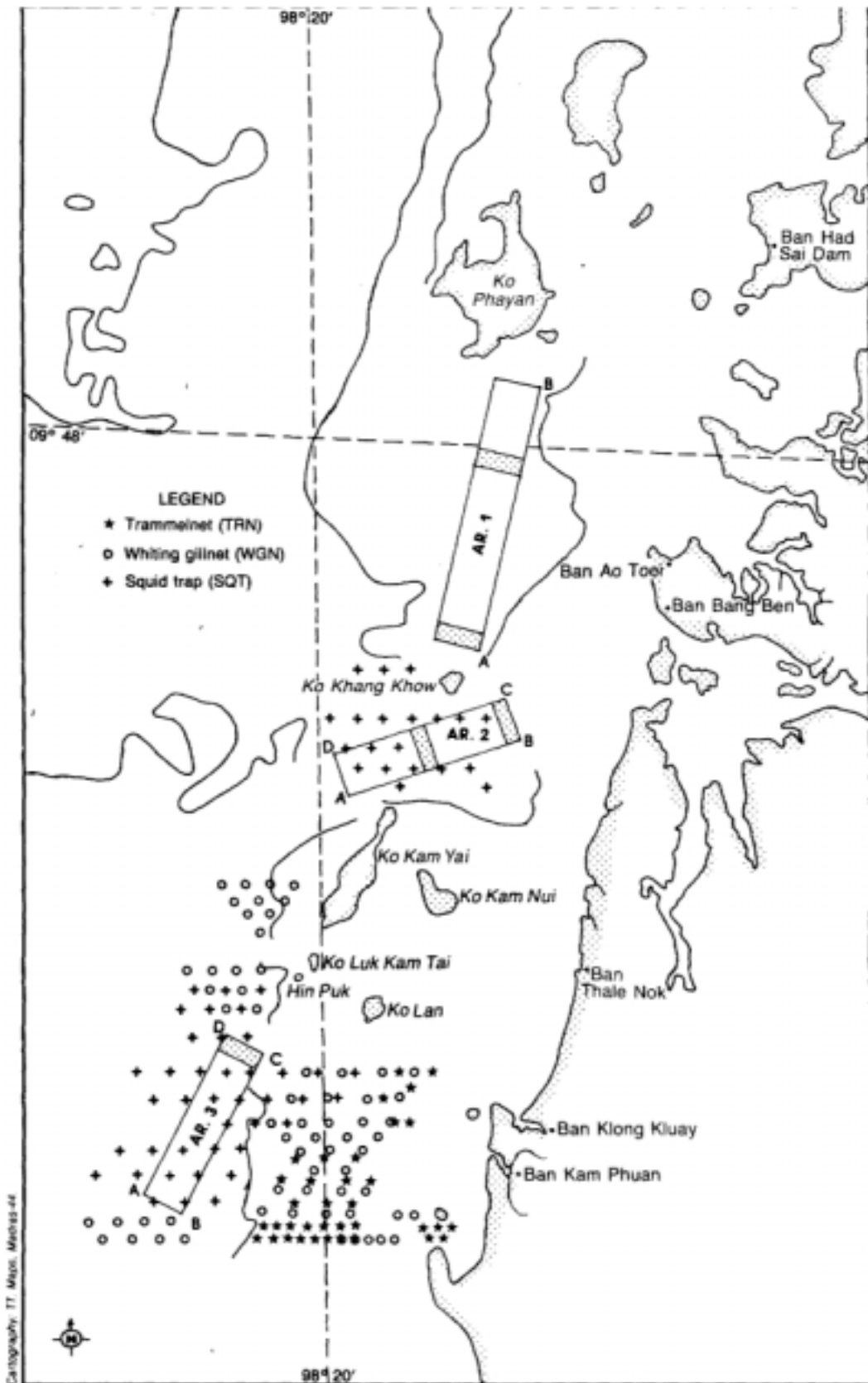
**Bioeconomics of small-scale fisheries in the artificial reef areas  
in Ranong Province, Thailand**

by

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Fig 31. Fishing gear used at the artificial reefs (ARs) in Ranong Province, Thailand



## 21. INTRODUCTION

A study to look into the operations and economics of existing small-scale fishing methods was considered an important component of the case study to assess the biosocioeconomics of small-scale fisheries in Ranong Province, particularly in the region likely to have been influenced by the installation of artificial reefs (ARs) in 1988.

This document describes the findings on the marine resources exploited, catch per unit effort (CPUE), income from fishing, operational costs and profitability when using the three most important fishing gear at or near the artificial reefs.

## 22. FISHING GEAR AND OPERATION

The choice of fishing gear and type of operation is sometimes dictated by considerations other than fishing efficiency or the level of investment. For instance, in the villages close to ARI (see Figure 31 on facing page), the fisherfolk – mostly Muslim – prefer fishing very close to the shore using small boats, despite a reported biomass much greater than at AR2 or AR3. It appears that religious obligations and social traditions outweigh such reasons as increased fishing income. As a result, most of the investigations have been limited to the fishing villages in the vicinity of AR3, where there are definite signs that small-scale fisheries have been influenced by the presence of artificial reefs.

The different fishing gear observed are given in Table 19.

**Table 19: Types and number of fishing gear in two fishing villages around AR3, Ranong Province, in 1987 and 1992**

Type of fishing gear	<i>Ban Kam Phuan</i>		<i>Ban Klong Kluay</i>		<i>Total</i>	
	1987	1992	1987	1992	1987	1992
Trammelnet	22	80	40	60	62	140
Whiting gillnet	5	65	15	-	20	65
Squid trap	4	70	-	40	4	110
Crab gillnet	-	10	-	-	-	10
Threadfin gillnet	-	4	-	2	-	6
Mackerel gillnet	-	10	-	5	-	15
Sardine gillnet	-	5	-	-	-	5
Pushnet	-	2	-	-	-	2
Small otter trawl						
with boom	7	10	-	-	7	10
Stick-held castnet	-	10	-	-	-	10
Grouper trap	-	10	-	20	-	30
Crab liftnet	-	20	15	2	15	22
Hand liftnet	-	10	-	-	-	10
Trollingline	-	20	-	-	-	20
Setnet	-	-	-	1	-	-
Small set bagnet	-	5	30	30	30	35
Scoopnet	9	20	-	-	9	20
Shrimp castnet	-	20	-	-	-	20
<b>Total</b>	<b>47</b>	<b>371</b>	<b>100</b>	<b>160</b>	<b>147</b>	<b>531</b>

The three main types of fishing gear used in the AR3 area are:

- Trammelnet (TRN)
- Whiting gillnet (WGN)
- Squid trap (SQT)

Though the boats using these gear varied in size and engine power, the fishing gear was similar. Of course, the larger boats carried more traps.

The two villages investigated are Ban Kam Phuan and Ban Klong Kluay. The former is close to the Myanmar border and several immigrant fisherfolk are available as crew to operate WGN. The latter village has a predominantly Muslim population and fisherfolk use smaller boats, mainly operating TRN and SQT.

### 22.1 Trammelnet (TRN)

The length of the net ranged from 960 - 1280 m and the depth from 1.4 to 1.5m. This net is operated during the day at depths of 4-12m to the east of AR3. Soaking time is usually 1-1 1/2 hours. Fishermen alternate this gear with others, depending on catches. The target species for this net is shrimp, particularly Banana shrimp (*Penaeus merguensis*). Besides shrimp, other species caught are Swimming crab, Mackerel and Croaker. These are mostly for home consumption. CPUE for all species ranged from 9.5 to 22 kg/trip, with the shrimp accounting for 5-10 kg/trip (see Appendix I, A and B). Two to four crew are required to operate this net.

### 22.2 Whiting gillnet (WGN)

The length of the net varies from 3,120 to 3,260 m and the depth from 1.5 to 1.6m. This net is also used during the day at depths of 8-16m in the north, east and south of AR3. Average soaking time is 1-1 1/2 hours. The target species for this net is Sand whiting (*Sillago sihama*). Other species caught are similar to TRN. CPUE for whiting was 11-67 kg/trip and 12.5-103 kg/trip for the total catch. Peak catches occurred during July and August, the Southwest Monsoon period (see Appendix I, C and D).

### 22.3 Squid trap (SQT)

The size of the trap is 0.80 x 0.12 x 0.60m and the number of traps carried depends on the size of the boat. About 30 traps are carried by boats 8-10m long, while the bigger boats carry up to 50 traps. Traps are set during the day and left for 6-7 hours. They are then lifted and stored on board at night to avoid damage from trawlers and prevent theft. Fishing trips could last up to three days with the smaller boats and up to six days with the bigger boats. About three fishermen are needed for the smaller boats and four for the bigger boats.

Traps are set to the west of AR3 at depths of 10-25 m — much deeper than TRN or WGN. The target species is Cuttlefish (*Sepioteuthis lessoniana*). CPUE for the smaller boats is 17-50 kg/trip and 60-150 kg/trip for the bigger boats. About 70 per cent of the catch is squid (see Appendix I, E and F).

## 23. FISHING EFFORT, COSTS AND EARNINGS

The total number of boats in operation varied from 46-80 boats a month. There were more operations during the Northeast Monsoon than during the stronger Southwest Monsoon. TRN were used more commonly during the Southwest Monsoon, while more SQT were set at the start of the Northeast Monsoon (see Figure 31).

Gross income from TRN was 500-1000 Baht\*/trip, of which more than 90 per cent was got from sales of *P. merguensis* (see Table 20 on facing page).

Prices obtained for different sizes and species are given in Table 20.

- US \$1 = 25 Baht (appx.)

Fig 31. Fishing effort (operating days) per gear and boat  
(Ban Kam Phuan, AR3, Ranong Province, Thailand)

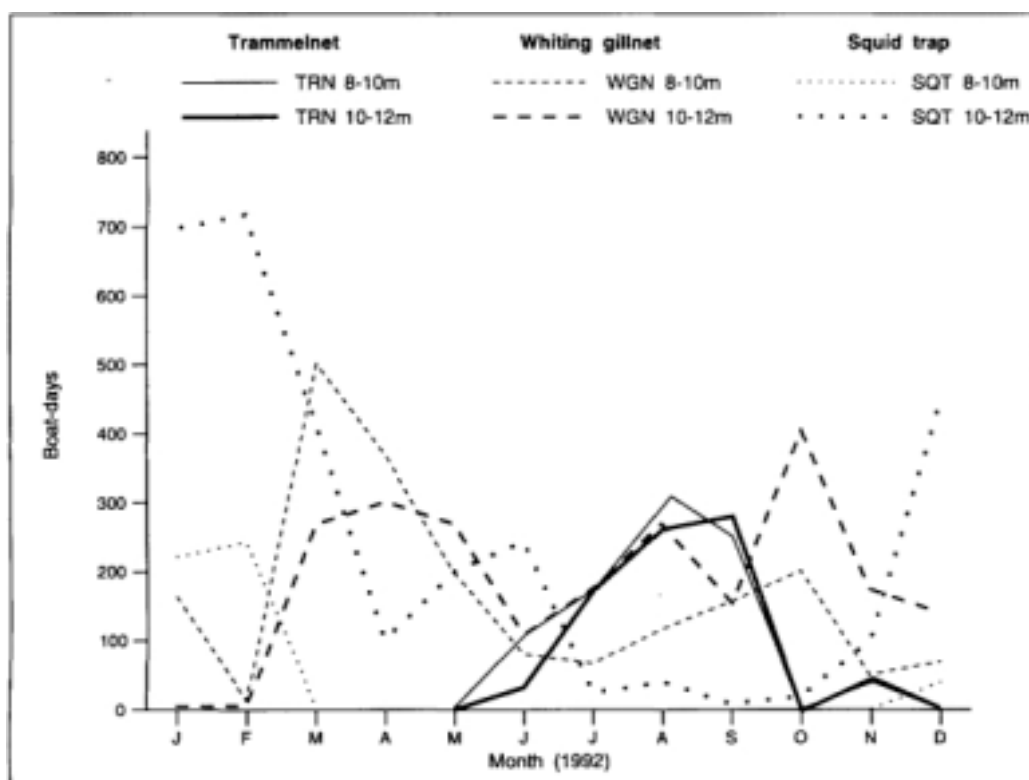


Table 20: Comparison of catch prices at Ban Klong Kluay and Ban Kam Phuan of species caught at AR3 (1988-89 and 1992)

Gear	Type of catch	Size		Price / kg (Baht)		
		Length (mm)	Weight (g)			
TRN	Big shrimps	(CL) 23-46	12-72	<70	90-110	110-120
	<i>Penaeus merguensis</i>					
	<i>P. monodon</i>					
	<i>P. semisulcatus</i>					
WGN	Small shrimps				25	35
	<i>Metapenaeus</i> spp.					
	<i>Sillago sihama</i>	(TL) 130-240	18-106	<40	35	35
	<i>S. ciliata</i>				20	20
SQT	<i>Sillago</i> spp. (incomplete body)					5
	<i>Sepioteuthis lessniana</i>	(TL)				
	big	175-280	294-800		40	63-67
	medium	142-176	185-320		40	33-37
	small	102-175	99-214		40	23-27
	<i>Sepia pharaonis</i>					
big	173-225	490-1,010		20	47-52	
small	132-168	210-350		20	18-22	

CL - Carapace length; TL - total length

Gross income from WGN was 325-2200 Baht/trip, with the higher incomes occurring during June to October (see Table 21 and Figures 32 and 33 on facing page).

Gross income with SQT ranged from 850 to 2785 Baht/day for the smaller boats with 30 traps and from 3745-8350 Baht/day for the larger boats. The smaller boats made 1-3 trips a day, while the bigger ones did 3-6. Over 70 per cent of the income is from the sale of Cuttlefish (*S. lessomiana*).

**Table 21: Income per trip and gear from fishing at AR3, in 1992**

Month	TRN		WGN		SQT			
	Boat size 8-12	Day/trip	Boat size 8-12	Day/trip	Boat size 8-10	Day/trip	Boat size 10-12	Day/trip
Jan	***		470.50	1	840.80	1	4,701.40	4
Feb	***		736.60	1	1,579.40	3	5,556.20	4
Mar	***		944.30	1	***		4,535.00	4
Apr	***		619.60	1	***		3,774.40	4
May	***		455.60	1	***		6,085.80	4
Jun	814.60	1	971.70	1	***		6,482.50	3
Jul	1,014.60	1	2,153.70	1	***		3,745.00	6
Aug	941.50	1	1,365.90	1	***		5,010.50	3
Sep	771.40	1	910.00	1	***		4,410.10	4
Oct	***		1,133.20	1	***		8,348.00	4
Nov	***		330.80	1	***		5,627.50	5
Dec	497.30	1	318.30	1	2,785.20	3	5,055.20	4

Note: TRN Big shrimp 110 Baht/kg; Small shrimp 35 Baht/kg  
WGN *Sillago sihama* 35 Baht/kg; *Sillago ciliata* 20 Baht/kg; *Sillago* spp. (incomplete body) 5 Baht/kg  
SQT *Sepioteuthis lessoniana* *Sepia pharaonis*  
Size Big Medium Small Big Small  
Bodyweight (g) >300 200/300 100/200 >400 150-400  
Price (Baht/kg) 63-67 33-37 23-27 47-52 18-22

**Table 22: Record of fishing operations AR3, Ranong Province, Thailand (1992)**

**Ban Kam Phuan**

WGN = Whiting gillnet, SQT = Squid trap, TRN = Trammelnet

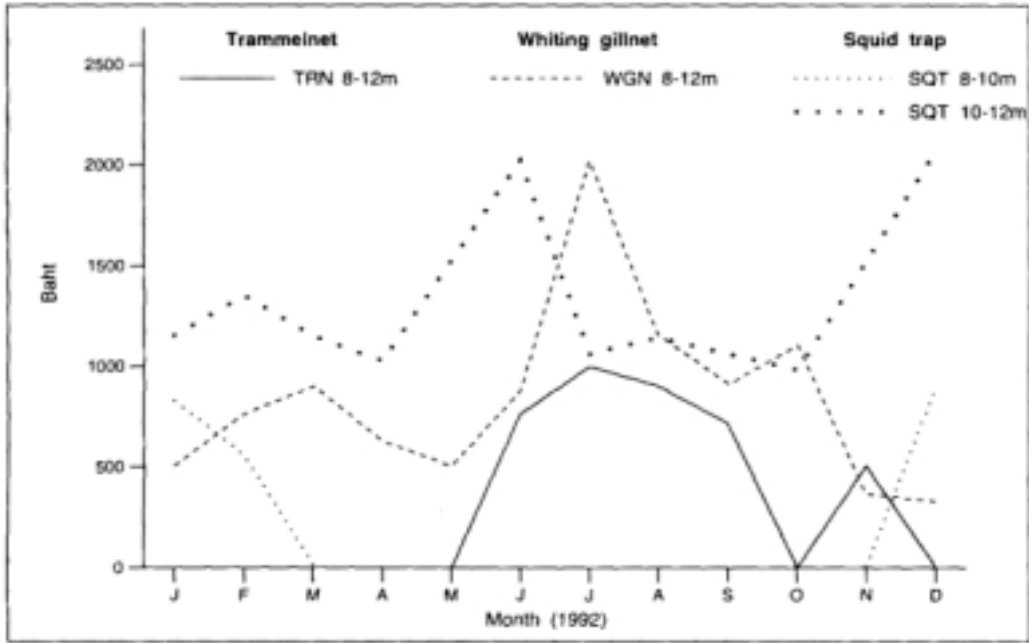
Boat size	Gear	Fishing operations recorded	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
		No. of trips	***	***	***	***	***	105	163	334	252	***	62	***	916
		CPUE		***	***	***	***	7.48	9.66	8.92	7.49	***	4.80	***	
	TRN	Total catch	***	***	***	***	***	785.40	1,574.58	2,979.28	1,887.48	***	297.60	***	7,524.34
		Income/trip	***	***	***	***	***	814.60	1,014.60	941.50	771.40	***	497.30	***	
		Total income	***	***	***	***	***	85,533.00	165,379.80	314,461.00	194,392.80	***	30,832.60	***	790,599.20
8-10m	WGN	No. of trips	161	35	510	364	182	77	68	132	161	224	81	90	2085
		CPUE	13.68	21.36	27.47	18.55	13.36	27.78	66.90	41.46	27.85	36.881	11.25	11.13	
		Total catch	2,202.48	747.60	14,009.70	6,752.20	2,431.52	2,139.60	4,549.20	5,472.72	4,483.85	8,245.44	911.25	1,001.70	52,946.72
		Income/trip	470.50	736.60	944.30	619.60	455.70	971.70	2,153.70	1,365.90	910.00	1,133.20	330.80	318.30	
		Total income	75,750.50	25,781.00	481,593.00	225,534.40	82,937.40	74,820.90	146,451.60	180,298.80	146,510.00	253,836.80	26,794.80	28,647.00	1,748,956.20
	SQT	No. of trips	238	84	***	***	***	***	***	***	***	***	***	20	342
		CPUE	17.00	28.29	***	***	***	***	***	***	***	***	***	50.80	
		Total catch	4,046.00	2,376.36	***	***	***	***	***	***	***	***	***	1,016.00	7,438.36
		Income/trip	840.80	1,579.40	***	***	***	***	***	***	***	***	***	2,785.20	
		Total income	200,110.40	132,669.60	***	***	***	***	***	***	***	***	***	55,704.00	388,484.00
	TRN	No. of trips	***	***	***	***	***	32	175	281	296	***	48	***	832
		CPUE	***	***	***	***	***	7.48	9.66	8.92	7.49	***	4.80	***	
		Total catch	***	***	***	***	***	239.36	1,690.50	2,506.52	2,217.04	***	230.40	***	6,883.82
		Income/trip	***	***	***	***	***	814.60	1,014.60	941.50	771.40	***	497.30	***	
		Total income	***	***	***	***	***	26,067.20	177,555.00	264,561.50	228,334.40	***	23,870.40	***	720,388.50
	WGN	No. of trips	8	12	288	297	274	108	178	287	160	396	152	137	2297
		CPUE	13.68	21.36	27.47	18.55	13.36	27.78	66.90	41.46	27.85	36.81	11.25	11.13	
		Total catch	109.44	256.32	7,911.36	5,509.35	3,660.64	3,000.24	11,908.20	11,899.20	4,456.00	14,576.76	1,710.00	1,524.81	66,522.14
		Income/trip	470.50	736.60	944.30	619.60	455.70	971.70	2,153.70	1,356.90	910.00	1,133.20	330.80	318.30	
		Total income	3,764.00	8,839.20	271,958.40	184,021.20	124,861.80	104,943.60	383,358.60	392,013.30	145,600.00	448,747.20	50,281.60	43,607.10	2,161,996.00
	SQT	No. of trips	175	179	98	21	50	76	4	14	4	9	24	120	774
		CPUE	82.17	92.11	74.46	68.56	100.61	102.00	59.00	78.55	73.49	150.73	90.58	83.19	
		Total catch	14,379.75	16,487.69	7,297.08	1,439.75	5,030.50	7,752.00	236.00	1,099.70	293.96	1,356.57	2,173.92	9,982.80	67,529.73
		Income/trip	4,701.40	5,556.20	4,535.00	3,774.40	6,085.80	6,482.50	3,745.00	5,010.50	4,410.10	8,348.00	5,627.50	5,055.20	
		Total income	822,745.00	994,559.80	444,430.00	79,262.40	304,290.00	492,670.00	14,980.00	70,147.00	17,640.40	75,132.00	135,06.00	606,624.00	4,057,540.60
	<b>Total Income</b>		<b>1,102,370.00</b>	<b>1,161,850.00</b>	<b>1,197,981.00</b>	<b>488,817.00</b>	<b>512,089.00</b>	<b>784,035.00</b>	<b>887,726.00</b>	<b>1,221,482.00</b>	<b>732,477.00</b>	<b>777,716.00</b>	<b>266,839.00</b>	<b>734,582.00</b>	<b>9,867,964.00</b>

**Ban Klong Klauay**

	SQT	No. of trips	***	***	***	***	***	240	273	675	615	***	132	***	1935
		CPUE	***	***	***	***	***	7.48	9.66	8.92	7.49	***	4.80	***	
		Total catch	***	***	***	***	***	1,795.20	2,637.18	6,021.00	4,606.35	***	633.60	***	15,693.33
		Income/trip	***	***	***	***	***	814.60	1,014.60	941.50	771.40	***	497.30	***	
		Total income	***	***	***	***	***	195,504.00	276,985.80	635,512.50	474,411.00	***	65,643.60	***	1,648,056.90
8-10m	SQT	No. of trips	312	96	***	***	***	***	***	***	***	***	***	22	430
		CPUE	17.00	28.29	***	***	***	***	***	***	***	***	***	50.80	
		Total catch	5,304.00	2,715.84	***	***	***	***	***	***	***	***	***	1,117.60	9,137.44
		Income/trip	840.80	1,579.40	***	***	***	***	***	***	***	***	***	2,785.20	
		Total income	262,329.60	151,622.40	***	***	***	***	***	***	***	***	***	61,274.40	475,226.40
	<b>Total income</b>		<b>262,329.60</b>	<b>151,622.40</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>195,504.00</b>	<b>276,985.80</b>	<b>635,512.50</b>	<b>474,411.00</b>	<b>***</b>	<b>65,643.60</b>	<b>61,274.40</b>	<b>2,123,283.30</b>

Total gross income with all three fishing gear in 1992, at Ban Kam Phuan (Table 22), was 9.87 million Baht, with SQT accounting for close to half the income (45%). In Ban Klong Kluay, total income was 2.12 million Baht, with TRN accounting for over 70 per cent. For the two villages combined – the AR3 area – the total catch amounted to 234.5 t, valued at nearly 12 million Baht.

**Fig 32. Income per day per trip, by gear and size of boat (Ban Kam Phuan, AR3, Ranong Province, Thailand)**



**Fig 33. Total income per month, by gear and size of boat (Ban Kam Phuan, AR3, Ranong Province, Thailand)**

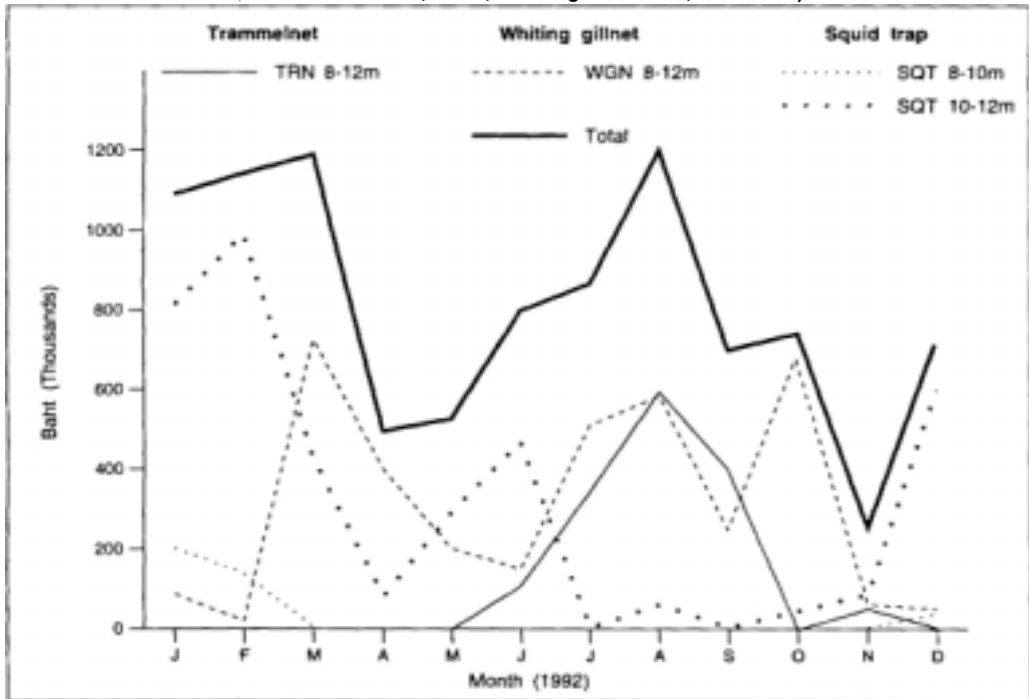
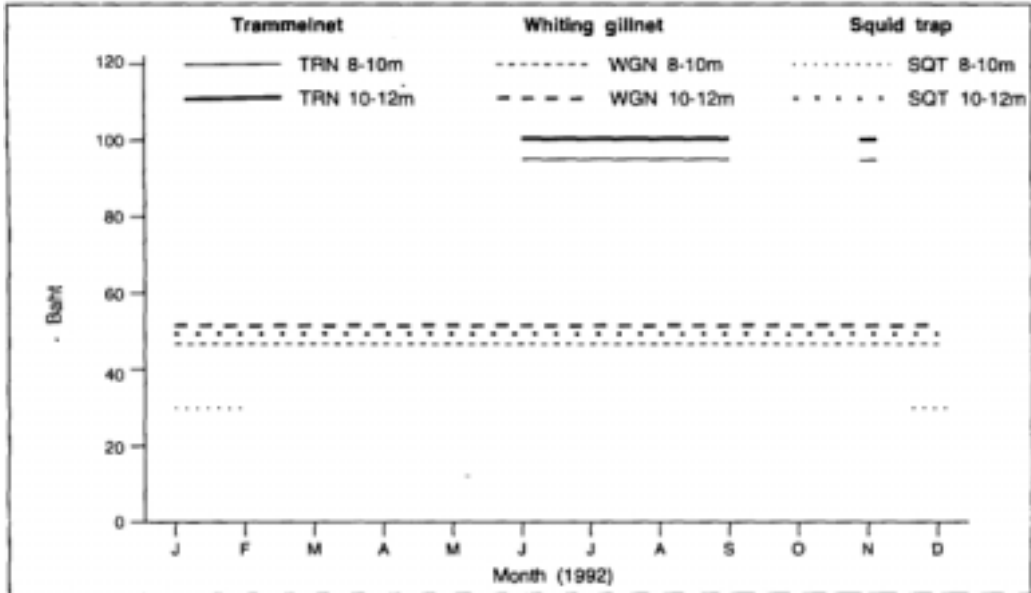
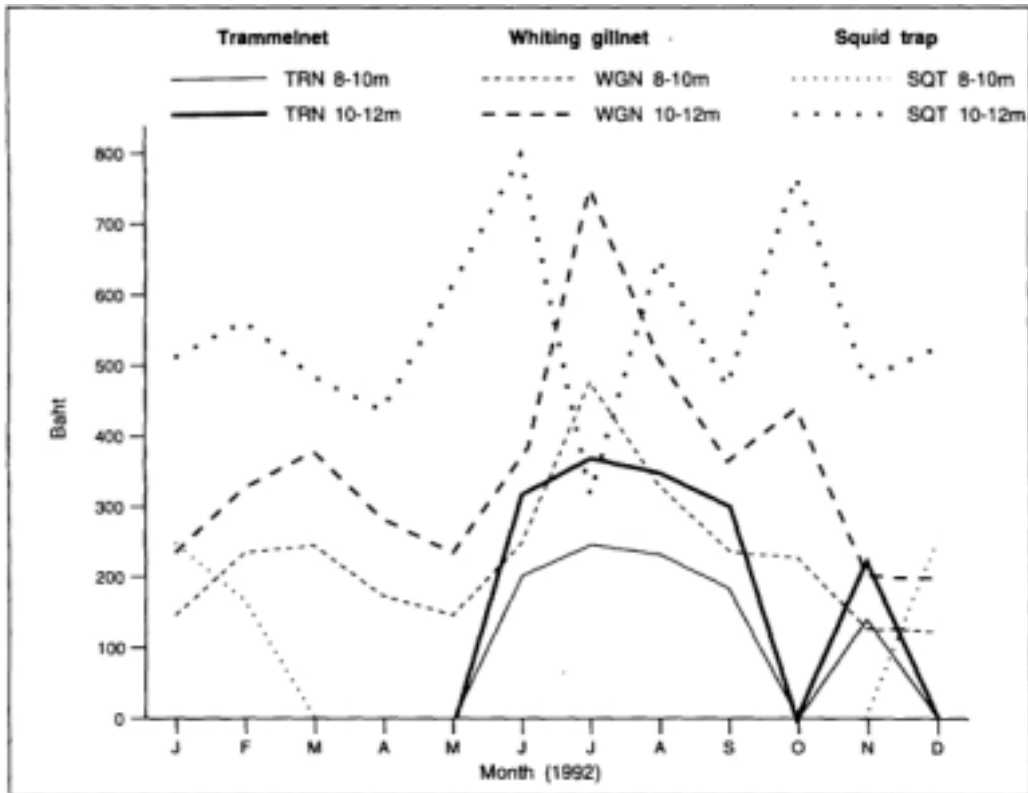


Figure 34 gives details of fixed costs for both boat types using TRN, WGN or SQT. The engines for the smaller boats are more expensive than those for the larger boats, because the latter generally use reconditioned automotive diesel engines. Among the three fishing gear, investment costs for WGN are the highest. Variable costs for each craft/gear combination are given in Figure 35. Also see Appendix II.

**Fig 34. Fixed costs per day, by gear and size of boat  
(Ban Kam Phuan, AR3, Ranong Province, Thailand)**



**Fig 35. Variable costs per day, by gear and size of boat  
(Ban Kam Phuan, AR3, Ranong Province, Thailand)**

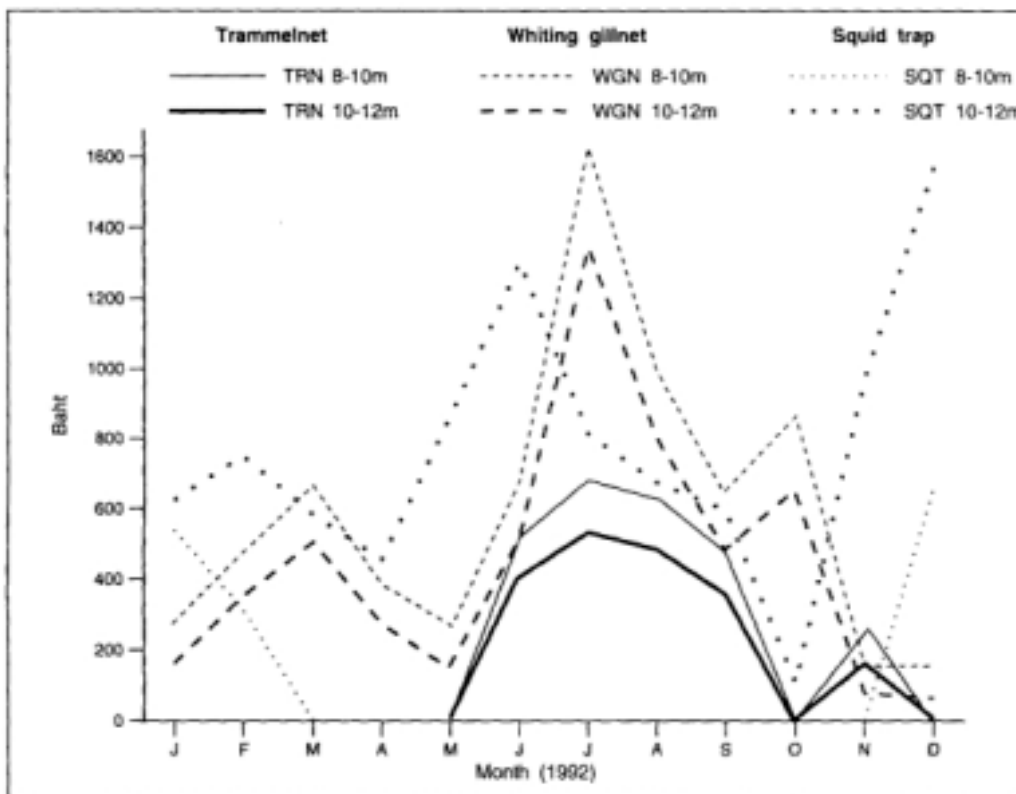




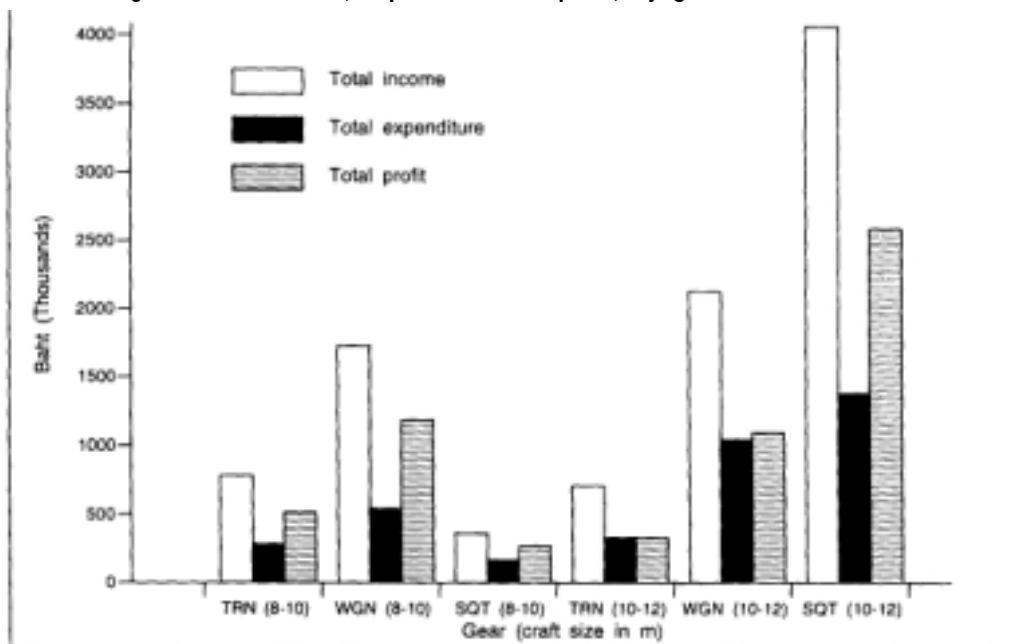
Crew share is arrived at after deducting variable costs from gross income and can vary between 20 and 30 per cent of the balance.

The owner's share in relation to investment cost (boat size) appears to be highest when using WGN with 8-10 m boats and highest with SQT when using larger boats (see Figures 36 and 37).

**Fig 36. Profit per day, by gear and size of boat  
(Ban Kam Phuan, AR3, Ranong Province, Thailand)**



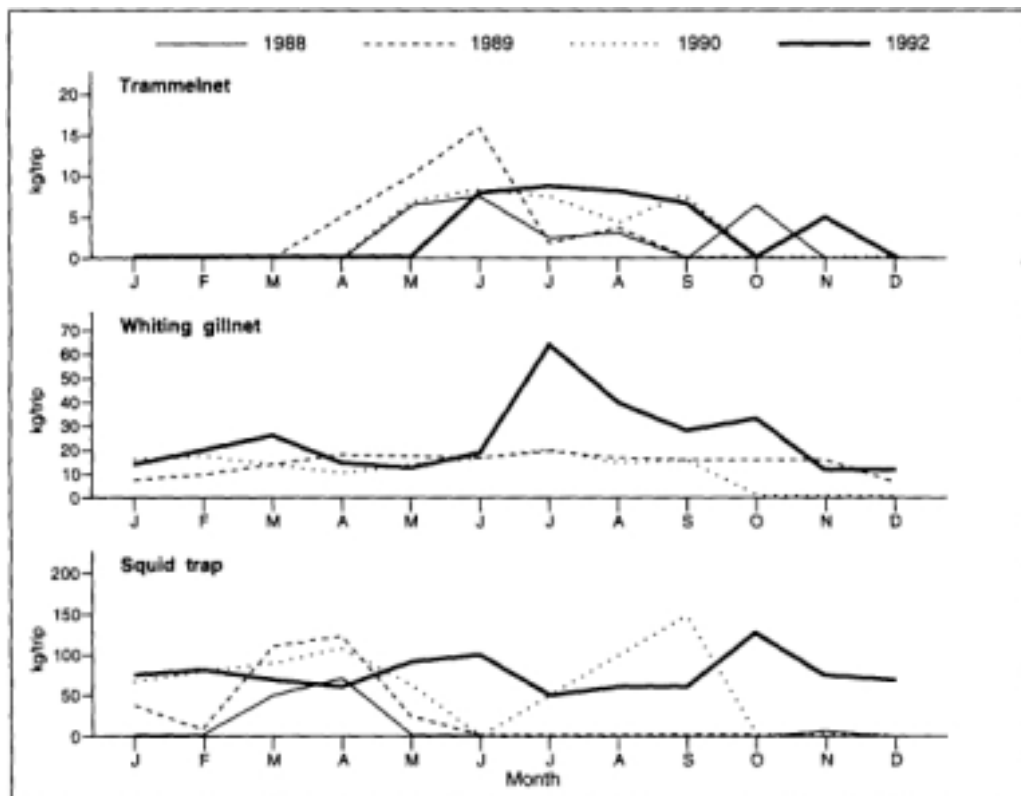
**Fig 37. Total income, expenditure and profit, by gear and size of boat**



## 24. CONCLUSIONS

- CPUE values for the three fishing gear have shown an increasing trend since the installation of AR3 (see Figure 38 below).
- Gross income has increased in both villages since 1988, despite the price level remaining nearly constant.
- SQT appears to have benefited most from the presence of AR3. This is evident in its profitability and the progressive increase in number of units over the years.
- TRN and WON are not used in the rectangular area of AR3. This is because it is feared that they may be damaged by the concrete modules, whose positions are no longer defined (all

Fig 38. CPUE (kg/trip) of different gear at AR3, Ranong Province, Thailand, 1988-92



## APPENDIX I

### Composition of all economic species captured by different gear at AR3, Ranong Province, Thailand, in 1992, their catch rates, catch rates of shrimp and income from shrimp

#### A. Composition and catch rates of economic species in the Trammelnet (TRN) fishery

<i>Species composition</i>	<i>Jun.</i> %	<i>Jul.</i> %	<i>Aug.</i> %	<i>Sep.</i> %	<i>Oct.</i> %	<i>Nov.</i> %	<i>Dec.</i> %
<i>Penaeus merguensis</i>	74.90	55.12	51.73	30.94	* * *	38.43	* * *
<i>P. monodon</i>	-	0.18	* * *	0.05	* * *	0.53	* * *
<i>P. semisulcatus</i>	-	* * *	* * *	* * *	* * *	0.09	* * *
<i>Metapenaeus</i> spp. and small shrimp	1.12	3.93	3.27	3.19	* * *	3.65	* * *
<b>Total shrimp</b>	76.02	59.23	55.00	34.18	* * *	42.70	* * *
Mackerel	2.03	12.02	5.92	16.52	* * *	3.03	* * *
Hardtail scad	0.10	0.12	* * *	0.14	* * *	* * *	* * *
Others	1.73	3.68	2.77	4.20	* * *	4.10	* * *
<b>Total pelagic fish</b>	3.86	15.82	8.69	20.86	* * *	7.13	* * *
Catfish	* * *	0.31	0.31	0.05	* * *	* * *	* * *
Tongue sole	1.32	1.59	0.62	1.51	* * *	0.62	* * *
Croaker	5.59	7.85	14.73	29.51	* * *	32.65	* * *
Sand whiting	2.74	1.41	0.55	2.65	* * *	* * *	* * *
Others	1.53	3.62	1.12	5.16	* * *	* * *	* * *
<b>Total demersal fish</b>	<b>11.18</b>	<b>14.78</b>	<b>17.33</b>	<b>38.88</b>	* * *	33.27	* * *
<i>Portunus pelagicus</i>	4.47	3.37	7.15	1.69	* * *	4.72	* * *
<i>P. sanguinolentus</i>	4.07	6.13	10.05	2.74	* * *	9.16	* * *
<i>Charybdis cruciata</i>	0.10	0.43	* * *	0.14	* * *	0.53	* * *
Othercrab	***	0.18	***	0.87	***		
Mantis shrimp	* * *	* * *	0.49	0.50	* * *	2.22	* * *
Cuttlefish	0.30	0.06	1.29	0.14	* * *	0.27	* * *
<b>Total invertebrate</b>	<b>8.94</b>	<b>10.17</b>	<b>18.98</b>	<b>6.08</b>	* * *	<b>16.90</b>	* * *
<b>Total general</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	* * *	<b>100.00</b>	* * *
CPUE (kg/trip)	9.84	16.31	16.22	21.91	* * *	11.24	* * *

Note: Size of boat 8-12 m

Appendix I (contd.)

**B. Catch rate of shrimp in the Trammelnet (TRN) fishery at AR3 and the income from the catch**

1992 Month		Penaeus merguiensis	Penaeus monodon	Penaeus semisulcatus	Metapenaeus and small shrimp	Total
June	Kg/trip	7.37		* * *	0.11	7.48
	%	98.50		* * *	1.50	100.00
	Gross Income (Baht/trip)	810.70		* * *	3.90	814.60
July	Kg/Trip	8.99	0.03	* * *	0.64	9.66
	%	93.10	0.30	* * *	6.60	100.00
	Gross Income (Baht/trip)	988.90	3.30	* * *	22.40	1,014.60
August	Kg/Trip	8.39		* * *	0.53	8.92
	%	94.10		* * *	5.90	100.00
	Gross Income (Baht/trip)	922.90		* * *	18.60	941.50
September	Kg/Trip	6.78	0.01	* * *	0.70	7.49
	%	90.50	0.10	* * *	9.40	100.00
	Gross Income (Baht/trip)	745.80	1.10	* * *	24.50	771.40
October	Kg/Trip					
	Gross Income (Baht/trip)					
November	Kg/Trip	4.32	0.06	0.01	0.41	4.80
	%	90.00	1.30	0.20	8.50	100.00
	•Gross Income (Baht/trip)	475.20	6.60	1.10	14.40	497.30

Note: Size of boat 8-12m

Appendix I (contd.)

**C. Composition and catch rate of economic species in the Whiting gillnet (WGN) fishery at AR3**

Species composition	1992 Jul.	Aug. %	Sep. %	Oct. %	Nov. %	Dec. %
Sillago sihama	59.09	84.12	72.15	78.32	73.15	54.04
Sillago ciliata	* * *	* * *	* * *	0.23	* * *	7.89
XXX	6.10	6.19	6.06	12.71	16.76	11.77
<b>Total Sandwhiting</b>	<b>65.19</b>	<b>90.31</b>	<b>78.21</b>	<b>91.26</b>	<b>89.91</b>	<b>73.70</b>
Mackerel	0.32	* * *	1.36	2.35	0.82	0.60
Hardtail scad	* * *	0.02	0.35	0.72	0.14	0.06
Yellowstrip trevally	* * *	0.04	0.29	0.03	* * *	0.36
Sardine	0.05	0.39	0.96	0.33	2.06	1.49
Others	0.43	0.19	1.89	1.70	0.41	0.06
<b>Total pelagic fish</b>	<b>0.80</b>	<b>0.64</b>	<b>4.85</b>	<b>5.13</b>	<b>3.43</b>	<b>2.57</b>
Catfish	0.12	* * *	0.38	* * *	* * *	0.36
Tongue sole	1.90	0.35	0.38	0.08	* * *	0.60
Croaker	22.00	0.12	4.27	* * *	1.37	4.24
Threadfinfish	0.06	* * *	0.38	* * *	0.69	* * *
Snapper	0.39	* * *	0.20	* * *	* * *	* * *
Barracuda	1.15	0.31	1.36	0.21	0.96	* * *
Others	0.80	0.27	1.40	1.80	1.23	0.25
<b>Total demersal fish</b>	<b>26.42</b>	<b>1.05</b>	<b>8.37</b>	<b>2.09</b>	<b>4.25</b>	<b>5.45</b>
Squid		***	0.03	***	***	***
Shrimp	0.02	* * *	0.03	* * *	* * *	* * *
<i>Portunus pelagicus</i>	1.66	1.01	3.28	0.67	0.55	1.55
<i>P. sanguinolentus</i>	5.88	0.43	4.27	0.54	1.72	6.69
Other crab	0.03	6.56	0.96	0.31	* * *	10.04
Mantis shrimp	* * *	* * *	* * *	* * *	0.14	* * *
<b>Total invertebrate</b>	<b>7.59</b>	<b>8.00</b>	<b>8.57</b>	<b>1.52</b>	<b>2.41</b>	<b>18.28</b>
<b>Total general</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
<b>CPUE (kg/trip)</b>	<b>103.35</b>	<b>45.90</b>	<b>35.58</b>	<b>40.33</b>	<b>12.51</b>	<b>15.10</b>

Note: Size of boat 8 - 12 m.

Appendix I (contd.)

D: Catch Rate of *Sillago* spp. in the Whiting gillnet (WGN) fishery at AR3 and income from the catch

1992 Month		Sillago sihama	Sillago cilliata	Sillago spp. (incomplete body)	Total
January	Kg/trip	13.13	0.54	0.01	13.68
		96.00	3.90	0.10	100.00
	Income Baht/trip	459.60	10.80	0.10	470.50
February	Kg/trip	20.99		0.37	21.36
	%	98.30		1.70	100.00
	Income Baht/trip	734.70		1.90	736.60
March	Kg/trip	26.79	0.21	0.47	27.47
	%	97.50	0.80	1.70	100.00
	Income Baht/trip	937.70	4.20	2.40	944.30
April	Kg/trip	17.13	0.86	0.56	18.55
	%	92.40	4.60	3.00	100.00
	Income Baht/trip	453.30	0.40	2.00	455.70
May	Kg/trip	12.95	0.02	0.39	13.36
	%	96.90	0.20	2.90	100.00
	Income Baht/trip	453.30	0.40	2.00	455.70
June	Kg/trip	27.76		0.02	27.78
	%	99.30		0.70	100.00
	Income Baht/trip	971.60		0.10	971.70
July	Kg/trip	60.64		6.26	66.90
	%	90.60		9.40	100.00
	Income Baht/trip	2,122.40		31.30	2,153.70
August	Kg/trip	38.62		2.84	41.46
	%	93.20		6.80	100.00
	Income Baht/trip	1,351.70		14.20	1,365.90
September	Kg/trip	25.69		2.16	27.85
	%	92.20		7.80	100.00
	Income Baht/trip	899.20		10.80	910.00
October	Kg/trip	31.59	0.09	5.13	36.81
	%	85.80	0.20	14.00	100.00
	Income Baht/trip	1,105.70	1.80	25.70	1,332.20
November	Kg/trip	9.15		2.10	11.25
		81.30		18.70	100.00
	Income Baht/trip	320.30		10.50	330.80
December	Kg/trip	8.16	1.19	1.78	11.13
	%	73.30	10.70	16.00	100.00
	Income Baht/trip	285.60	23.80	8.90	318.30

Note: Price of *Sillago* spp. from Whiting gillnet fishery

- *Sillago sihama* 35 Baht/kg
- *Sillago ciliata* 20 Baht/kg
- *Sillago* spp. incomplete body 5 Baht/kg

Appendix I (contd.)

E. Composition and catch rate of squid with squid traps (SQT) at AR3 off Ban Kam Phuan

1992 Month	Boat Size	Sepioteuthis lessoniana				Sepia pharaonis			Total	CPUE kg/trip
		Big %	Medium	Small %	Subtot. %	Big	Small %	Subtot		
January	8-10	50.90	31.60	* * *	82.50	6.10	11.40	17.50	100.00	17.00
	10-12	82.10	11.30	0.50	93.90	3.10	3.00	6.10	100.00	82.17
February	8-10	68.70	18.90	* * *	87.60	6.90	5.50	12.40	100.00	28.29
	10-12	83.50	12.80	0.70	97.00	2.70	0.30	3.00	100.00	92.11
March	8-10	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
	10-12	84.10	10.00	0.40	94.50	5.10	0.40	5.50	100.00	74.46
April	8-10	***	***		***	***	***	***	***	***
	10-12	69.20	22.30	8.00	99.50	0.50	* * *	0.50	100.00	68.56
May	8-10	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
	10-12	82.80	12.70	* * *	95.50	4.40	0.10	4.50	100.00	100.61
June	8-10	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
	10-12	93.30	3.00	* * *	96.30	3.70	* * *	3.70	100.00	102.00
July	8-10	***	***	***	***	***	***	***	***	***
	10-12	89.80	* * *	* * *	89.80	10.20	* * *	10.20	100.00	59.00
August	8-10	***	***	***	***	***	***	***	***	***
	10-12	91.90	* * *	* * *	91.90	8.10	* * *	8.10	100.00	78.55
September	8-10	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
	10-12	66.70	* * *	* * *	66.70	33.30	* * *	33.30	100.00	73.49
October	8-10	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
	10-12	35.90	* * *	* * *	35.90	64.10	* * *	64.10	100.00	150.73
November	8-10	***	***	***	***	***	***	***	***	
	10-12	80.80	* * *	* * *	80.80	19.20	* * *	19.20	100.00	90.58
December	8-10	53.70	17.40	* * *	71.10	26.80	2.10	28.90	100.00	50.80
	10-12	80.80	7.50	* * *	88.30	11.00	0.70	11.70	100.00	83.19

Note: Size of boat 8 - 12 m.

**Appendix I (contd.)**

**F. CPUE (kg/trip) and income by species and size of squid caught with squid traps (SQT) at AR3 off Ban Kam Phuan**

1992 Month	Boat size	Sepiotuethis lessoniana					Sepia pharaonis			Subtotal	Total
		Big	Medium	Small	Subtotal	Big	Medium	Small			
January	8-10	Kg	8.65	5.37	***	14.02	1.03	1.95	2.98	17.00	
		Income	562.30	188.00	***	750.30	51.50	39.00	90.50	840.80	
		10-12	Kg	67.45	9.26	0.46	77.17	2.55	2.45	5.00	82.17
February	8-10	Income	4,189.30	324.10	11.50	4,524.90	127.50	49.00	176.50	4,701.40	
		Kg	19.43	5.36	***	24.79	1.96	1.54	3.50	28.29	
		Income	1,263.00	187.60	***	1,450.60	98.00	30.80	128.80	1,579.40	
March	8-10	Kg	76.89	11.79	0.63	89.31	2.46	0.34	2.80	92.11	
		Income	4,997.90	412.70	15.80	5,426.40	123.00	6.80	129.80	5,556.20	
		10-12	Kg	***	***	***	***	***	***	***	***
April	8-10	Income	62.62	7.46	0.28	70.36	3.82	0.28	4.10	74.46	
		Kg	4,070.30	261.10	7.00	4,338.40	191.00	5.60	196.60	4,535.00	
		Income	***	***	***	***	***	***	***	***	
May	8-10	Kg	47.47	15.28	5.46	68.21	0.35	***	0.35	68.56	
		Income	3,085.60	534.80	136.50	3,756.90	17.50	***	17.50	3,774.40	
		10-12	Kg	***	***	***	***	***	***	***	***
June	8-10	Income	83.32	12.79	***	96.11	4.41	0.09	4.50	100.61	
		Kg	5,415.80	447.70	***	5,863.50	220.50	1.80	222.30	6,085.80	
		Income	***	***	***	***	***	***	***	***	
July	8-10	Kg	95.21	3.05	***	98.26	3.74	***	3.74	102.00	
		Income	6,188.70	106.80	***	6,295.50	187.00	***	187.00	6,482.50	
		10-12	Kg	***	***	***	***	***	***	***	***
August	8-10	Income	53.00	***	***	53.00	6.00	***	6.00	59.00	
		Kg	3,445.00	***	***	3,445.00	300.00	***	300.00	3,745.00	
		Income	***	***	***	***	***	***	***	***	
September	8-10	Kg	72.20	***	***	72.20	6.35	***	6.35	78.55	
		Income	4,693.00	***	***	4,693.00	317.50	***	317.50	5,010.50	
		10-12	Kg	***	***	***	***	***	***	***	***
October	8-10	Income	49.04	***	***	49.04	24.45	***	24.45	73.49	
		Kg	3,187.60	***	***	3,187.60	1,222.50	***	1,222.50	4,410.10	
		Income	***	***	***	***	***	***	***	***	
November	8-10	Kg	54.10	***	***	54.10	96.63	***	96.63	150.73	
		Income	3,516.50	***	***	3,516.50	4,831.50	***	4,831.50	8,348.00	
		10-12	Kg	***	***	***	***	***	***	***	***
December	8-10	Income	73.23	***	***	73.23	17.35	***	17.35	90.58	
		Kg	4,760.00	***	***	4,760.00	867.50	***	867.50	5,627.50	
		Income	***	***	***	***	***	***	***	***	
December	8-10	Kg	27.29	8.81	***	36.10	13.63	1.07	14.70	50.80	
		Income	1,773.90	308.40	***	2,082.30	681.50	21.40	702.90	2,785.20	
		10-12	Kg	67.19	6.24	***	73.43	9.14	0.62	9.76	83.19
December	8-10	Income	4,367.40	218.40	***	4,585.80	457.00	12.40	469.40	5,055.20	
		Kg	***	***	***	***	***	***	***	***	
		Income	***	***	***	***	***	***	***	***	

**Note:** Price of cuttlefish from squid trap

Size	Sepiotuethis lessoniana			Sepia pharaonis	
	Big	Medium	Small	Big	Small
Bodyweight (g)	>300	200/300	100/200	>400	150-400
Price (Baht/kg)	63-67	33-37	23-27	47-52	18-22



## APPENDIX II

### Variable costs, fixed costs, income and profit from fishing at AR3, Ranong Province, Thailand, 1988-92

#### Operating variable costs per day per gear and size of boat

Boat size (m)	Gear	Variables	Baht/day												Avg/day
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
<b>1988</b>															
	TRN	Fuel	***	***	***	***	3700	37.00	3700	3700	***	3700	***	***	37.00
		Ice	***	***	***	***	4.0	4.0	4.0	4.0	***	40	***	***	4.0
		Crew	***	***	***	***	137.00	154.00	61.00	84.00	***	148.00	***	***	116.80
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>178.00</b>	<b>195.00</b>	<b>102.00</b>	<b>125.00</b>	<b>***</b>	<b>189.00</b>	<b>***</b>	<b>***</b>	<b>157.80</b>
8-10	WON	Fuel	***	***	***	***	***	***	***	***	***	***	***	***	
		Ice	***	***	***	***	***	***	***	***	***	***	***	***	
		Crew	***	***	***	***	***	***	***	***	***	***	***	***	
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	
	SQT	Fuel	***	***	57.00	57.00	***	***	***	***	***	***	***	***	5700
		Ice	***	***	31.00	31.00	***	***	***	***	***	***	***	***	31.00
		Crew	***	***	78.00	129.00	***	***	***	***	***	***	***	***	103.50
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>166.00</b>	<b>217.00</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>19150</b>
	TRN	Fuel	***	***	***	***	91.00	91.00	91.00	91.00	***	91.00	***	***	91.00
		Ice	***	***	***	***	4.0	4.0	4.0	4.0	***	4.0	***	***	4.0
		Crew	***	***	***	***	189.00	215.00	75.00	110.00	***	206.00	***	***	159.00
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>284.00</b>	<b>310.00</b>	<b>170.00</b>	<b>205.00</b>	<b>***</b>	<b>301.00</b>	<b>***</b>	<b>***</b>	<b>254.00</b>
10-12	WGN	Fuel	***	***	***	***	***	***	***	***	***	***	***	***	
		Ice	***	***	***	***	***	***	***	***	***	***	***	***	
		Crew	***	***	***	***	***	***	***	***	***	***	***	***	
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	
	SQT	Fuel	***	***	157.00	157.00	***	***	***	***	***	***	***	***	157.00
		Ice	***	***	63.00	63.00	***	***	***	***	***	***	***	***	63.00
		Crew	***	***	77.00	154.00	***	***	***	***	***	***	***	***	115.50
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>297.00</b>	<b>374.00</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>335.50</b>
<b>1989</b>															
	IRN	Fuel	***	***	***	37.00	37.00	37.00	37.00	37.00	***	***	***	***	37.00
		Ice	***	***	***	4.0	4.0	4.0	4.0	4.0	***	***	***	***	4.0
		Crew	***	***	***	96.00	201.00	356.00	37.00	103.00	***	***	***	***	158.60
		<b>Total</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>137.00</b>	<b>242.00</b>	<b>397.00</b>	<b>78.00</b>	<b>144.00</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>199.60</b>
8-10	WON	Fuel	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	
		Ice	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	
		Crew	42.00	58.00	108.00	156.00	150.00	157.00	184.00	138.00	119.00	126.00	122.00	45.00	117.08
		<b>Total</b>	<b>100.00</b>	<b>116.00</b>	<b>166.00</b>	<b>214.00</b>	<b>208.00</b>	<b>215.00</b>	<b>242.00</b>	<b>196.00</b>	<b>177.00</b>	<b>184.00</b>	<b>180.00</b>	<b>103.00</b>	<b>175.08</b>
	SQT	Fuel	65.00	65.00	65.00	65.00	65.00	***	***	***	***	***	***	65.00	
		Ice	35.00	35.00	35.00	35.00	35.00	***	***	***	***	***	***	35.00	
		Crew	46.00	2.00	186.00	211.00	23.00	***	***	***	***	***	***	93.60	
		<b>Total</b>	<b>146.00</b>	<b>102.00</b>	<b>286.00</b>	<b>311.00</b>	<b>123.00</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>***</b>	<b>193.60</b>
TRN	—	Trammelnet													
WGN	—	Whiting gillnet													
SQT	—	Squid trap													

**Appendix II (contd.)**

Boat size	Gear	Variables	Baht/day												Avg/day	
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
TRN	Fuel					91.00	91.00	91.00	91.00	91.00	91.00	***	***	***	***	91.00
	Ice					4.0	4.0	4.0	4.0	4.0	4.0	***	***	***	***	40
	Crew	***	***	**	127.00	285.00	518.00	40.00	139.00	***	***	***	***	***	***	221.80
	<b>Total</b>	***	***	***	<b>222.00</b>	<b>380.00</b>	<b>613.00</b>	<b>135.00</b>	<b>234.00</b>	***	***	***	***	***	***	<b>316.80</b>
10-12 WGN	Fuel	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00	129.00
	Ice	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	Crew	39.00	63.00	137.00	211.00	202.00	211.00	253.00	183.00	155.00	165.00	159.00	43.00	151.75		
	<b>Total</b>	<b>177.00</b>	<b>201.00</b>	275.00	<b>349.00</b>	<b>340.00</b>	<b>349.00</b>	<b>391.00</b>	<b>321.00</b>	<b>293.00</b>	<b>303.00</b>	<b>297.00</b>	<b>181.00</b>	<b>289.75</b>		
SQT	Fuel	143.00	143.00	143.00	143.00	143.00	***	***	***	***	***	***	***	***	143.00	
	Ice	70.00	70.00	70.00	70.00	70.00	***	***	***	***	***	***	***	***	29.17	
	Crew	35.00	0.00	245.00	283.00	1.00	***	***	***	***	***	***	***	***	112.80	
	<b>Total</b>	<b>248.00</b>	<b>213.00</b>	458.00	<b>496.00</b>	<b>214.00</b>	***	***	***	***	***	***	***	***	<b>284.97</b>	
<b>1992</b>																
TRN	Fuel	*	***	***	* *	***	45.00	45.00	45.00	45.00	***	45.00	***	45.00	45.00	
	Ice			***			5.00	5.00	5.00	5.00	***	5.00	***	5.00	5.00	
	Crew	***	***	***	***	***	153.00	193.00	178.00	144.00	***	89.00	***	151.40		
	<b>Total</b>	***	***	***	***	**	<b>203.00</b>	<b>243.00</b>	<b>228.00</b>	<b>194.00</b>	*	<b>139.00</b>	***	<b>201.40</b>		
8.10 WON	Fuel	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	
	Ice	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	
	Crew	80.00	133.00	175.00	110.00	77.00	181.00	417.00	259.00	168.00	213.00	52.00	50.00	159.58		
	<b>Total</b>	<b>150.00</b>	<b>203.00</b>	<b>245.00</b>	<b>180.00</b>	147.00	<b>251.00</b>	<b>487.00</b>	329.00	238.00	238.00	283.00	122.00	229.58		
SQT	Fuel	70.00	50.00		***	***	***	***	***	***				50.00	5667	
	Ice	35.00	35.00		***	***	***	***	***	***	***	***	***	35.00	35.00	
	Crew	147.00	88.00		***	***	***	***	***	***	***	***	***	169.00	134.67	
	<b>Total</b>	<b>252.00</b>	<b>173.00</b>	***	***	***	***	**	***	***	***	***	***	254.00	<b>226.33</b>	
TRN	Fuel	***	***	***	* *	***	95.00	95.00	95.00	95.00	***	95.00	***	95.00		
	Ice	*	*	***	***	***	5.00	5.00	5.00	5.00	***	5.00	***	5.00		
	Crew	***	***	***	***	***	214.00	274.00	252.00	201.00	***	119.00	***	212.00		
	<b>Total</b>	***	***	***	***	***	<b>314.00</b>	374.00	<b>352.00</b>	<b>301.00</b>	***	<b>219.00</b>	***	312.00		
10-12 WGN	Fuel	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00	135.00		
	Ice	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00		
	Crew	97.00	178.00	240.00	142.00	93.00	248.00	603.00	366.00	229.00	296.00	56.00	52.00	216.67		
	<b>Total</b>	<b>242.00</b>	<b>323.00</b>	<b>385.00</b>	287.00	238.00	<b>393.00</b>	<b>748.00</b>	<b>511.00</b>	<b>374.00</b>	<b>441.00</b>	201.00	197.00	361.67		
SQT	Fuel	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00		
	Ice	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		
	Crew	287.00	351.00	274.00	217.00	390.00	582.00	121.00	435.00	265.00	560.00	272.00	305.00	338.25		
	<b>Total</b>	<b>507.00</b>	<b>571.00</b>	494.00	437.00	<b>610.00</b>	<b>802.00</b>	<b>341.00</b>	655.00	485.00	<b>780.00</b>	<b>492.00</b>	525.00	<b>558.25</b>		

Appendix II (contd.)

**Income, variable/fixed costs and profit per day  
per gear and size of boat**

Boat size	Gear	income and costs	Baht/day												Avg/day
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
<b>1988</b>															
	TRN	Income	***	***	***	***	725.00	810.00	345.00	463.00	***	781.00	***	***	<b>624.80</b>
		Variables	***	***	***	***	178.00	195.00	102.00	125.00	***	189.00	***	***	157.80
		Fixed	***	***	***	***	64.00	64.00	64.00	64.00	***	64.00	***	***	64.00
		<b>Profit</b>	***	***	***	***	<b>483.00</b>	<b>551.00</b>	<b>179.00</b>	<b>274.00</b>	***	<b>528.00</b>	***	***	<b>403.00</b>
8-10	WGN	Income	***	***	***	***	***	***	***	***	***	***	***	***	
		Variables	***	***	***	***	***	***	***	***	***	***	***	***	
		Fixed	***	***	***	***	***	***	***	***	***	***	***	***	
		<b>Profit</b>	***	***	***	***	***	***	***	***	***	***	***	***	
	SQT	Income	***	***	477.00	732.00	***	***	***	***	***	***	***	***	604.50
		Variables	***	***	166.00	217.00	***	***	***	***	***	***	***	***	191.50
		Fixed	***	***	20.00	20.00	***	***	***	***	***	***	***	***	20.00
		<b>Profit</b>	***	***	291.00	495.00	***	***	***	***	***	***	***	***	<b>393.00</b>
	TRN	Income	***	***	***	***	725.00	810.00	345.00	463.00	***	781.00	***	***	624.80
		Variables	***	***	***	***	284.00	310.00	170.00	205.00	***	301.00	***	***	254.00
		Fixed	***	***	***	***	74.00	74.00	74.00	74.00	***	74.00	***	***	74.00
		<b>Profit</b>	***	***	***	***	<b>367.00</b>	<b>426.00</b>	<b>101.00</b>	<b>184.00</b>	***	<b>406.00</b>	***	***	<b>296.80</b>
10-12	WGN	Income	***	***	***	***	***	***	***	***	***	***	***	***	
		Variables	***	***	***	***	***	***	***	***	***	***	***	***	
		Fixed	***	***	***	***	***	***	***	***	***	***	***	***	
		<b>Profit</b>	***	***	***	***	***	***	***	***	***	***	***	***	
	SQT	Income	***	***	477.00	732.00	***	***	***	***	***	***	***	***	604.50
		Variables	***	***	297.00	374.00	***	***	***	***	***	***	***	***	335.50
		Fixed	***	***	38.00	38.00	***	***	***	***	***	***	***	***	38.00
		<b>Profit</b>	***	***	<b>142.00</b>	<b>320.00</b>	***	***	***	***	***	***	***	***	231.00
<b>1989</b>															
	TRN	Income	***	***	***	519.00	146.00	1,823.00	228.00	558.00	***	***	***	***	834.80
		Variables	***	***	***	137.00	242.00	397.00	78.00	144.00	***	***	***	***	199.60
		Fixed	***	***	***	64.00	64.00	64.00	64.00	64.00	***	***	***	***	64.00
		<b>Profit</b>	***	***	***	318.00	<b>740.00</b>	<b>1,362.00</b>	<b>86.00</b>	<b>350.00</b>	***	***	***	***	<b>571.20</b>
8-10	WGN	Income	268.00	348.00	596.00	840.00	810.00	842.00	980.00	749.00	654.00	688.00	669.00	281.00	643.75
		Variables	100.00	116.00	166.00	214.00	208.00	215.00	242.00	196.00	177.00	184.00	180.00	103.00	175.08
		Fixed	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00
		<b>Profit</b>	<b>139.00</b>	<b>203.00</b>	<b>401.00</b>	<b>597.00</b>	<b>573.00</b>	<b>598.00</b>	<b>709.00</b>	<b>524.00</b>	<b>448.00</b>	<b>475.00</b>	<b>460.00</b>	<b>149.00</b>	<b>439.67</b>
	SQT	Income	330.00	110.00	1,028.00	1,157.00	217.00	***	***	***	***	***	***	***	568.40
		Variables	146.00	102.00	286.00	311.00	123.00	***	***	***	***	***	***	***	193.60
		Fixed	20.00	20.00	20.00	20.00	20.00	***	***	***	***	***	***	***	20.00
		<b>Profit</b>	<b>164.00</b>	<b>-12.00</b>	<b>722.00</b>	<b>826.00</b>	<b>74.00</b>	***	***	***	***	***	***	***	<b>354.80</b>

**Appendix II (contd.)**

Boat size	Gear	Income and costs	Baht/day												Avg/day
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
	TRN	Income	***	***	***	519.00	1,046.00	1,823.00	228.00	558.00	***	*	*	***	834.80
		Variables	***	***	***	222.00	380.00	613.00	135.00	234.00	***	***	***	***	316.80
		Fixed	***	***	***	7400	74.00	7400	7400	7400	***	***	***	***	7400
		Profit	***	***	***	223.00	592.00	1,136.00	19.00	250.00	***	***	***	***	444.00
10-12	WGN	Income	268.00	348.00	596.00	840.00	810.00	842.00	980.00	749.00	654.00	688.00	669.00	281.00	643.75
		Variables	177.00	205.00	275.00	349.00	340.00	349.00	391.00	321.00	293.00	303.00	297.00	185.00	290.42
		Fixed	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
		Profit	53.00	105.00	283.00	453.00	432.00	455.00	551.00	390.00	323.00	347.00	334.00	58.00	315.33
	SQT	Income	330.00	110.00	1,028.00	1,157.00	217.00	***	***	***	***	***	***	**	568.40
		Variables	248.00	213.00	458.00	496.00	214.00	***	***	***	***	***	***	***	108.60
		Fixed	38.00	38.00	38.00	38.00	38.00	***	***	***	***	***	***	***	12.67
		Profit	44.00	-141.00	532.00	623.00	-35.00	***	***	***	***	***	***	***	447.13
<b>1992</b>															
	TRN	Income	**	***	***	***	***	814.60	1,014.60	941.50	771.40	***	49730	***	807.88
		Variables	***	***	*	**	***	203.00	243.00	228.00	194.00	***	139.00	***	201.40
		Fixed	***	***	***	***	***	93.60	93.60	93.60	93.60	***	9360	***	93.60
		Profit	***	***	***	***	***	518.00	678.00	619.90	483.80	***	264.70	***	512.88
8-10	WGN	Income	470.50	736.60	944.30	619.60	455.70	971.70	2,153.70	1,365.90	910.00	1,133.20	330.80	318.30	867.53
		Variables	150.00	230.00	245.00	180.00	147.00	251.00	487.00	329.00	238.00	233.00	122.00	120.00	227.67
		Fixed	43.20	43.20	43.20	43.20	43.20	43.20	43.20	43.20	43.20	43.20	43.20	43.20	43.20
		Profit	277.30	463.40	656.10	396.40	265.50	677.50	1,623.50	993.70	628.80	857.00	165.60	155.10	596.66
	SQT	Income	841.60	526.50	***	***	***	***	***	***	\$ **	***	***	928.40	765.50
		Variables	252.00	173.00	**	**	***	***	***	***	***	**	***	254.00	226.33
		Fixed	30.00	30.00	***	***	***	***	***	***	***	***	***	3000	30.00
		Profit	559.60	323.50	***	***	***	***	***	***	***	***	***	644.40	509.17
	TRN	Income	***	**	***	***	***	814.60	1,014.60	941.50	771.40	***	497.30	***	807.88
		Variables	***	***	***	***	***	314.00	374.00	352.00	301.00	***	219.00	***	312.00
		Fixed	***	***	***	***	***	102.10	102.10	102.10	102.10	***	102.10	***	102.10
		Profit	***	***	***	***	***	398.50	538.50	487.40	368.30	***	176.20	***	393.78
10-12	WGN	Income	470.50	736.60	944.30	619.60	455.70	971.70	2,153.70	1,365.90	910.00	1,133.20	330.80	318.30	867.53
		Variables	242.00	323.00	385.00	287.00	238.00	393.00	748.00	511.00	374.00	441.00	201.00	197.00	361.67
		Fixed	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70
		Profit	176.80	361.90	507.60	280.90	166.00	527.00	1,354.00	803.20	484.30	640.50	78.10	69.60	454.16
	SQT	Income	1,175.40	1,389.10	1,133.00	943.60	1,521.50	2,160.80	1,175.40	1,389.10	1,133.80	943.60	1,521.50	2,160.80	1,387.37
		Variables	507.00	571.00	494.00	437.00	610.00	802.00	314.00	655.00	485.00	780.00	492.00	525.00	556.00
		Fixed	49.50	49.50	49.50	49.50	49.50	49.50	49.50	49.50	49.50	49.50	49.50	49.50	49.50
		Profit	618.90	768.60	590.30	457.10	862.00	1,309.30	811.90	684.60	599.39	114.10	980.00	1,586.30	781.87