

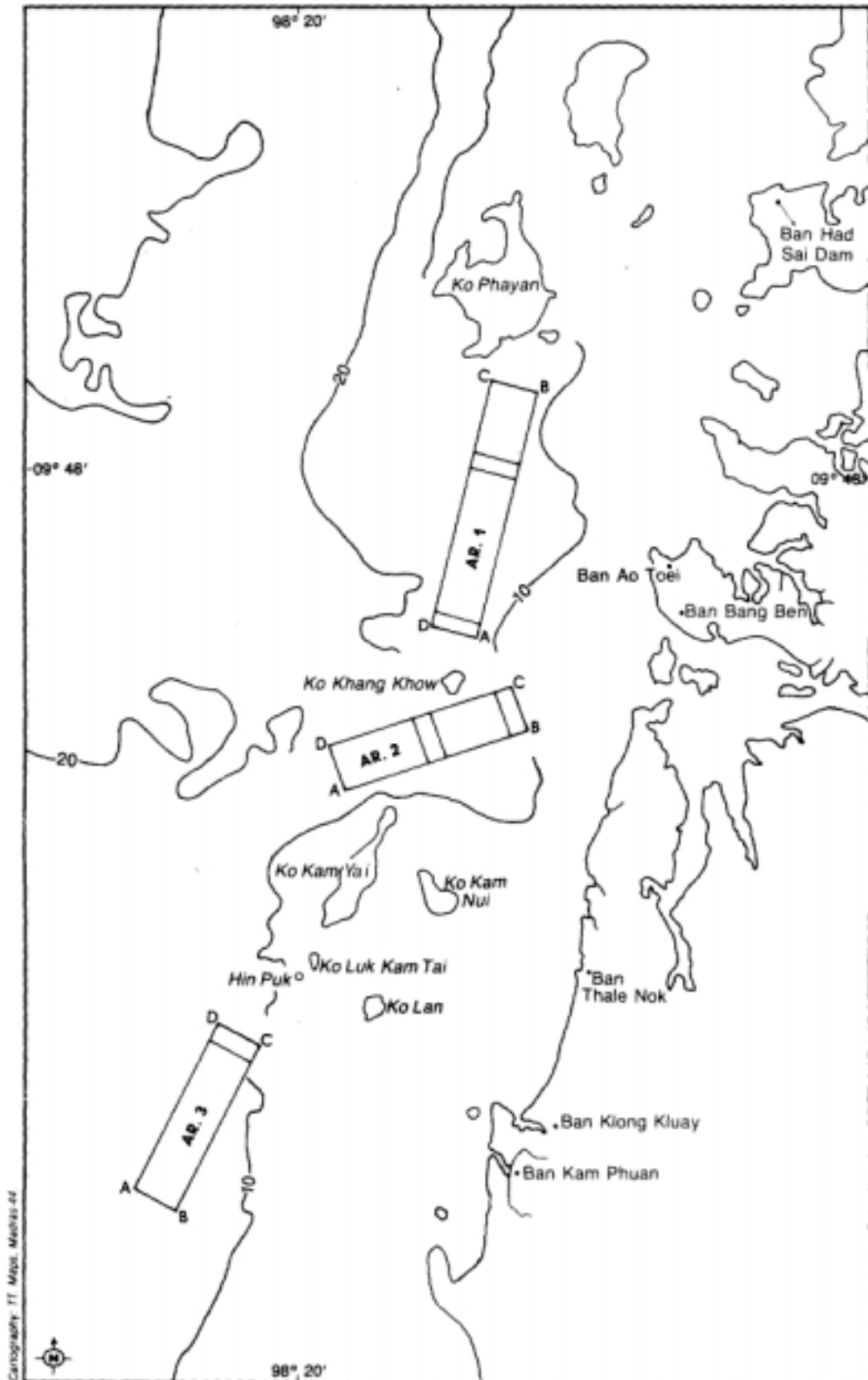
**Socioeconomics of small-scale fisheries in the Artificial Reef Areas
in Ranong Province, Thailand**

by

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Fig 39. Location of six villages in Ranong Province, Thailand, where a socioeconomic assessment was made of fisherfolk after the introduction of artificial reefs



25. INTRODUCTION

There has been a noticeable increase in fisherfolk population in the districts of Muang and Kapur, which are close to the artificial reef sites AR1, AR2 and AR3. This could be partly due to increase in population and partly due to the influx of immigrant fisherfolk in search of better prospects. Socioeconomic assessment of the fisherfolk community is an important component to link their status and well-being to the bioeconomics of their livelihood — fishing.

This document describes the findings of a socioeconomic study undertaken in six villages (see Figure 39) spread along the coastline and representative of villages that may have benefited from the installation of ARs through increased fishing activity and income. Data was collected by direct interviews as well as from past records. The main objectives of the study were to

- Identify changes in fishing households;
- Record the attitude and perceptions of fisherfolk regarding artificial reefs;
- Achieve a better understanding of the socioeconomics of small-scale fisheries; and
- Examine management options likely to benefit the community and optimally utilize the marine resources at the ARs.

A total of 124 households were surveyed in these villages:

- ARI** - Ban Had Sai Dam
- AR2** - Ban Bang Ben, Ban Ao Toei
- AR3** - **Ban** Thale Nok, Ban Klong Kluay, Ban Kam **Phuan**

26. FINDINGS

26.1 Changes in number of fishing households

A comparison of the results from the 1985 and 1990 marine fishery censuses showed that while there was a 6.5 per cent reduction in the number of fishing households along the Andaman Sea Coast, there was a **1 per cent increase in Ranong Province (Table 23)**.

Table 23: Comparison of number of fishing households by provinces in the Andaman coastal zone in 1967, 1985 and 1990

Province	1967	1985		1990	
	No. offishing households	No. offishing households	% of change	No. offish households	% of change
Ranong	1931	1947	0.8	1959	0.6
Phang Nga	3423	3514	2.7	3072	-12.6
Phuket	1082	1097	1.4	909	-17.1
Krabi	2280	2359	3.5	2276	-3.5
Trang	2446	2528	3.4	2168	-14.2
Satun	3329	3416	2.6	3576	4.7
Total	14491	14861	2.6	13960	-6.1

- Sources:**
1. The 1985 Marine Fishery Census of Thailand, National Statistical Office, Thailand.
 2. Report of the 1990 Intercensal Survey of Marine Fishery, National Statistical Office, Thailand.

The number of fishing households in the fishing villages close to AR1, AR2 and AR3 increased by 120 per cent, from 210 to 462 between 1987 and 1990 (Table 24). This suggests that installing ARs did spur fishing activity, resulting in an increase of fisherfolk households.

Table 24: Comparison of numbers of households close to ARs in Ranong in 1987 and 1991

AR area	No. of households			No. of fishing households		
	1987 (Non-ARs)	1991 (ARs)	% change	1987 (Non-ARs)	1991 (ARs)	% change
AR1	252	411	63	118	197	67
AR2	101	287	184	60	187	212
AR3	81	80	-1	32	78	144
Total	434	778	79	210	462	120

Source: Small-scale Fisheries Development Project, Ranong Province, Thailand.

26.2 Changes in fishing methods and fishing gear

One of the main objectives in installing artificial reefs was to deter trawlers from operating in the area and encourage passive, small-scale fishing methods. The 1987 census figures and present data show (Table 25) that trawlers have definitely reduced in number in the area and have completely disappeared from the coast adjacent to AR1.

Table 25: Type and numbers of fishing gear used in the area of the ARs, in Ranong, 1987 and 1992

Types of fishing gear	AR1			AR2			AR3			Total		
	1987 (no.)	1992 (no.)	% change	1987 (no.)	1992 (no.)	% change	1987 (no.)	1992 (no.)	% change	1987 (no.)	1992 (no.)	% change
Whiting gillnet	-	50	-	2	55	2650	20	30	50	22	135	514
Trammelnet	28	90	221	8	55	588	66	140	112	102	285	179
Squid trap	3	15	400	-	3	-	4	110	2650	7	128	1729
Small otter trawl	10	-	-	-	-	-	7	10	43	17	10	-41
Others	240	179	-25	94	250	166	86	242	181	420	671	60
Total	281	334	19	104	363	249	183	532	191	568	1229	116

Source: Small scale Fisheries Development Project, Ranong Province, Thailand.

What is interesting, however, is that the number of trawlers in the entire Ranong Province had increased by 113 per cent (Table 26), many fishing in Myanmar waters. The number of fishing craft using whiting gillnet (WGN), trammelnet (TRN) and squid trap (SQT) increased by 6,3 and 18 times, respectively (Table 25)! This clearly vindicates the objective of installing artificial reefs to promote passive fishing gear for the exploitation of marine resources in the coastal areas.

Table 26: Comparison of the numbers of trawl gear in Ranong Province, in 1985 and 1990

Types of trawl	1985		1990		Percentage of Change
	Amount	%	Amount	%	
Otter trawl	73	94.8	156	95.1	114
Pair trawl	4	5.2	8	4.9	100
Total	77	100.0	164	100.0	113

Sources: 1. The 1985 Marine Fishery Census of Thailand, National Statistical Office, Thailand.
2. Report of the 1990 Intercensal Survey of Marine Fishery, National Statistical Office, Thailand.

26.3 Profile of fishing households

In the villages adjoining the three AR sites, 66 per cent of the population is Muslim. Close to 65 per cent of household heads have received primary school education. The number of members per household is 5, on an average. Active fisherfolk between the ages of 15 and 65 are 43 per cent of the fisherfolk population (Table 27).

Table 27: Number of household members by sex and age in 1992

Items	AR1		AR2		AR3		Total	
	No.	%	No.	%	No.	%	No.	%
Sex:	190	100.0	119	100.0	302	100.0	618	100.0
Male	90	47.4	60	50.4	167	55.3	319	51.6
Female	100	52.6	59	49.6	135	44.7	229	37.1
Age:	100.0	119	100.0	302	100.0	661	100.0	
<15	95	50.0	57	47.9	110	36.4	262	39.6
15-40	68	35.8	55	46.2	139	46.0	262	39.6
41-65	26	13.7	7	5.9	51	16.9	84	12.7
> 65	1	0.5	-	-	2	0.7	3	0.5

Source: By survey.

Some fisherfolk in villages adjoining AR2 have additional income from other sources, such as farming, but villages close to AR1 and AR3 rely on fishing and fishery-related activity for their livelihood (Table 28).

Table 28: Occupation distribution of fishing households by AR areas in 1992

Items	AR1		AR2		AR3		Total	
	No.	%	No.	%	No.	%	No.	%
FO	23	65.7	8	34.8	44	66.7	75	60.5
FO+FP	4	11.4	10	43.5	5	7.6	19	15.3
FO+NF	7	20.0	3	13.0	14	21.2	24	19.4
FO+FP+NF	1	2.9	2	8.7	3	4.5	6	4.8
Total	35	100.0	23	100.0	66	100.0	124	100.0

Note: FO = Fishing operation only
 FO+FP = Fishing operation + fish-processing
 FO+NF = Fishing operation + nonfishing operation
 FO+FP+NF = Fishing operation + fish-processing + nonfishing operation

Most of the fishing households own boats, with over half of them owning boats 8-10 m long and fitted with outboard engines. Most fisherfolk own/operate more than one type of fishing gear. On an average, there were 142 fishing days/household (Table 29).

Table 29: Monthly number of fishing days/household near the ARs in 1992

ARs	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
AR1	20	15	17	14	14	10	7	13	12	7	8	6	139
AR2	23	19	18	20	20	12	9	3	12	18	14	13	138
AR3	26	20	11	14	11	7	8	4	13	11	14	16	147
Total avg.	23	18	15	16	15	10	8	7	12	12	12	12	142

Source: By survey

26.4 Income offishing households and standard of living

Income from fishing is the main income, though some households derive extra income from fish-processing, e.g. drying squid, drying fish and making shrimp paste. Table 30 gives details of household incomes. Income from fishing is highest in villages close to AR3 (5.5,000 Baht/household/year).

Table 30: Monthly net cash income (baht/household) and sources of income in each AR area in 1992

AR area	Sources of income	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (Baht)	%
AR1															
	Fishing	3,138	2,676	2,605	1,383	2,227	1,461	1,968	2,125	3,722	2,149	2,144	2,202	21,868	85.0
	Nonfishing	3,08	1,091	683	509	283	148	277	220	58	55	38	186	3,856	15.0
	Total	3,446	3,767	3,288	1,892	2,510	1,609	2,245	2,345	3,780	2,104	2,182	2,388	25,724	100.0
AR2															
	Fishing	3,727	4,677	3,772	2,421	3,666	3,590	2,417	1,186	4,252	1,890	1,693	649	26,558	77.3
	Nonfishing	3,875	30	910	592	133	733			457	183	600	7,783	22.7	
	Total	7,602	4,977	4,682	3,013	3,799	4,323	2,417	1,186	4,252	2,347	1,876	1,249	34,341	100.0
AR3															
	Fishing	6,531	10,248	3,433	2,639	2,864	5,542	4,569	3,114	6,098	4,751	2,139	4,175	46,083	83.5
	Nonfishing	2,656	1,643	1,040	769	750	836313	117	150	246	313	243	9,076	16.5	
	Total	9,187	11,891	4,473	3,408	3,614	6,378	4,882	3,231	6,248	4,997	2,452	4,418	55,159	100.0
Average															
	Fishing	4,465	5,867	3,270	2,148	2,919	3,531	2,985	2,142	4,691	2,897	1,992	2,342	31,503	84.4
	Nonfishing	2,048	1,087	890	621	392	508	231	148	82	224	156	249	5,819	15.6
	Total	6,513	6,954	4,160	2,769	3,311	4,039	3,216	2,290	4,773	3,121	2,148	2,591	37,322	100.0

Figures for 1986 and 1992 show that there is an increase of nearly 26 per cent in fishing income and a decrease of household debt by 21 per cent (Table 31)

The standard of living expressed by Engel's Coefficient (% of food expense to total expense) shows that fisherfolk households are better off than the rest of the coastal village population, but they still spend over half their income on food (Table 32 on facing page). At AR3 villages alone, the Engel's Coefficient has reduced from 75 per cent in 1986 to 54 per cent, indicating a definite improvement in the standard of living.

Table 31: Comparison of household income, debt and living expenditure at AR3, before AR deployment (1986) and after AR deployment

Items	Before deployment of AR (1986)*		After deployment of AR (1992)**		% of change
	Baht/year	%	Baht/year	%	
Household income	43,096	100.0	55,159	100.0	28
Fishing operation	36,580	84.9	46,083	83.5	26
Fish processing	1,210	2.8	145	0.3	-88
Farming	4,513	10.5	1,414	2.6	-69
Employee	585	1.4	4,036	7.3	590
Others	208	0.5	3,481	6.3	1574
Living expenditure	28,438	100.0	40 163	100.0	41
Food	21,410	75.3	21,685	54.0	1
Clothes	1,438	5.1	3,735	9.3	160
Utilities	1,152	4.1	5,261	13.1	357
Medical care	1,887	6.6	1,325	3.3	-30
Education	519	1.8	1,526	3.8	194
Others	2,032	7.1	6,631	16.5	226
Debt:	8,523		6,775		-21

Source: * Boonchuwong, P., 1987.; **By survey

27. PERCEPTIONS OF FISHERFOLK

It is to be expected that with increased fishing incomes, the fisherfolk exploiting AR3 have the most positive reactions to the installation of ARs. The fact that 91 per cent of them feel that ARs are the property of the fisherfolk and should be cared for by them is evidence enough to conclude that the installation of ARs has benefited small-scale fisherfolk. Reactions to other relevant questions are given in Table 33 on facing page.

Table 32: Average annual living expenditure and Engel's Coefficient of fishing households by types of craft-gear combinations operated in different AR areas in 1992

Boat size and types of gear group	AR1		AR2		AR3		Total average	
	Living expenditure (baht/year)	Engel's Cof (%)	Living expenditure (baht/year)	Engel's Cof (%)	Living expenditure (baht/year)	Engel's Cof (%)	Living expenditure (baht/year)	Engel's Cof (%)
Boat size < 8m.	25,611	61	26,258	51	30,728	52	25,943	59
TN-Other	19,918	56	-	-	51,810	34	12,953	34
Others	27,509	62	26,258	51	29,106	54	18,877	53
Boat size 8.10 m.	37,070	55	24,386	54	39,795	58	35,640	56
TN-Other	34,283	62	23,533	60	31,690	58	32,020	60
WGN-TN-Other	38,840	43	37,456	41	-	-	38,247	42
WGN-TN-ST-Other	-	-	-	-	40,180	41	40,180	41
Others	41,927	51	19,805	61	45,493	58	38,174	57
Boat size 11-12 m.	-	-	79,970	42	46,654	52	51,780	50
WGN-Others	-	-	-	-	43,684	49	43,684	49
TN-Others	-	-	37,280	32	-	-	37,280	32
ST-Others	-	-	-	-	49,086	55	49,086	55
WGN-ST	-	-	-	-	56,046	70	56,046	70
WGN-TN-others	-	-	71,920	42	45,140	54	58,530	47
TN-ST-Others	-	-	-	-	70,560	42	70,560	42
WGN-TN-ST-Others	-	-	-	-	30,918	43	30,918	43
Others	-	-	105,340	44	25,770	51	57,598	46
Total	33,141	57	31,652	53	40,158	54	36,600	55

Note: 1) WON = Whiting gillnet
 TN = Trammelnet
 ST = Squid trap
 Others = Other fishing gear
 2) Engel's Coefficient = Food expenditure/total living expenditure as a percentage

Table 33: Attitude of fishermen to the objectives of the ARs by AR area

Items of attitude	AR1			AR2			AR3			All ARs		
	Ac-cept (%)	Uncer-lain (%)	Dis-agree (%)	Ac-cept (%)	Uncer-lain (%)	Dis-agree (%)	Ac-cept (%)	Uncer-lain (%)	Dis-agree (%)	Ac-cept (%)	Uncer-lain (%)	Dis-agree (%)
Increasing resources in coastal area	42.8	54.3	2.9	60.9	39.1	-	83.3	16.7	-	68.6	30.6	0.8
Trawl gear prevention	48.6	51.4	-	56.5	34.8	8.7	62.1	27.3	10.6	57.2	35.5	7.3
Increasing of catch	31.4	65.7	2.9	56.5	43.5	-	62.1	34.8	1.6	53.2	44.4	2.4
Saving ¹ fishing time	20.0	77.1	2.9	34.8	60.9	4.3	43.9	48.5	7.6	35.5	58.9	5.6
Increasing of fishing season	20.0	77.1	2.9	47.8	52.2	-	47.0	45.4	7.6	39.5	55.7	4.8
Increasing more types of fishing gear	28.6	65.7	5.7	39.1	52.2	8.7	37.9	48.5	13.6	35.5	54.0	10.5
Suitable fishing ground for small-scale fishermen	45.7	51.4	2.9	56.5	43.5	-	74.3	24.2	1.5	62.9	35.5	1.6
Present ARs are useful for small-scale fishing	42.8	54.3	2.9	65.2	34.8	-	78.8	18.2	3.0	67.0	30.6	2.4
The ARs are common property and should be taken care by fishermen	45.7	51.4	2.9	65.2	34.8	-	90.9	7.6	1.5	73.4	25.0	1.6