

PILOT PROJECT ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF ZONE B TRAWLERS IN THE STATES OF KEDAH AND PERLIS, MALAYSIA*

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Introduction

The trawl is the main gear that contributed substantially towards the total marine production on the West Coast of Peninsular Malaysia since 1971 (Figure 1). Before 1970, trawl contributions to the total marine landings were less than 30%. From 1970 to 1985, the trawl fishery had developed rapidly and contributed 40 to 50% of the total marine landings on this coast. In the subsequent years until now, the contribution has been more than 60% and the trawl remains the most important gear in terms of landings. Perlis and Kedah the focus area of this study, are located in the northern-most part of the west coast (Figure 2). These States contributed 121,000 mt or 25% of the total landings of the west coast of Peninsular in 2001 (Table 1). Landing composition and its trends are given in Table 2. As shown, the highest landings of demersal, pelagic and anchovy were recorded during 1980 to 1984, while the highest landings of prawn, cephalopod and shellfish were in 1992. In general, the present total landings are much lower than the peak value at 286,000 mt which were recorded in 1982.

About 57,433 mt or 47% of the marine landings in Kedah and Perlis came from 717 licensed trawlers, which were manned by 2,956 fishers in 2001 (Table 3). Among the trawlers, Zone B trawlers (about 20 GRT and 20 HP) are the most dominant in Perlis and Kedah representing 67% and 83% (Table 4) of the total trawlers, respectively. Analysis undertaken by the Fisheries Research Institute in partnership with Worldfish Center showed that with the rapid expansion of trawl fishing in the 1970's, the demersal fish resources in coastal areas of Perlis and Kedah have been reduced to as low as 8% (<50 m depth) and 38% (50-91 m depth). The reduction is based on the amount present in the survey in 1997 compared to 1972.

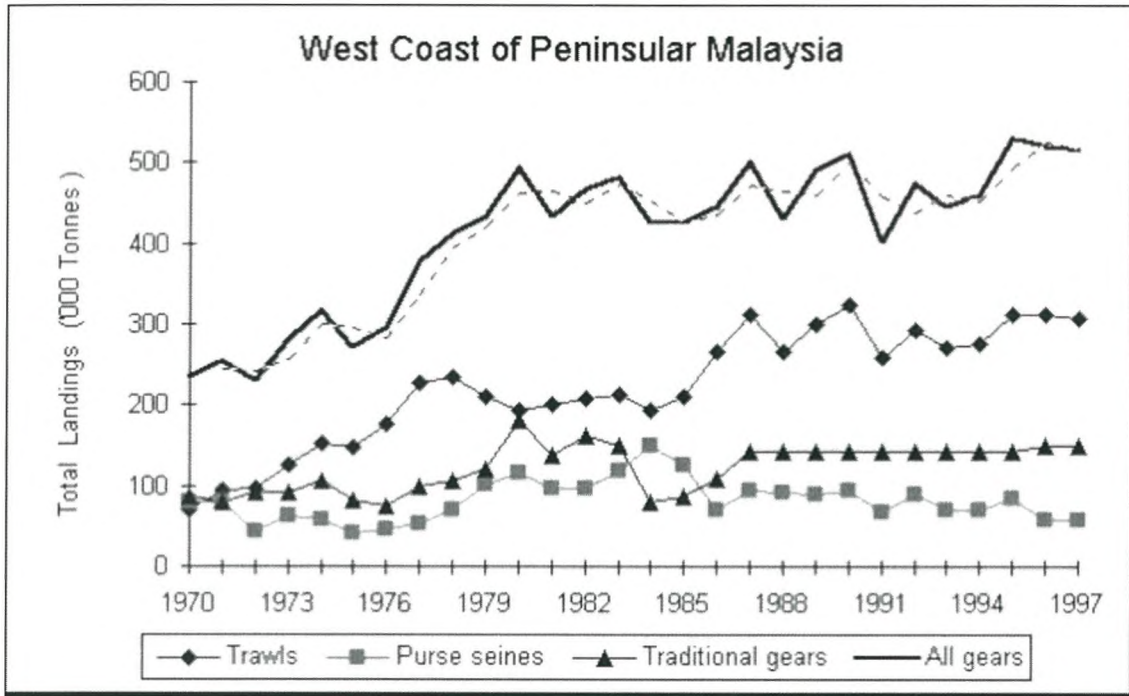


Figure 1: Trend of marine landings by type of gear on the west coast of Peninsular Malaysia

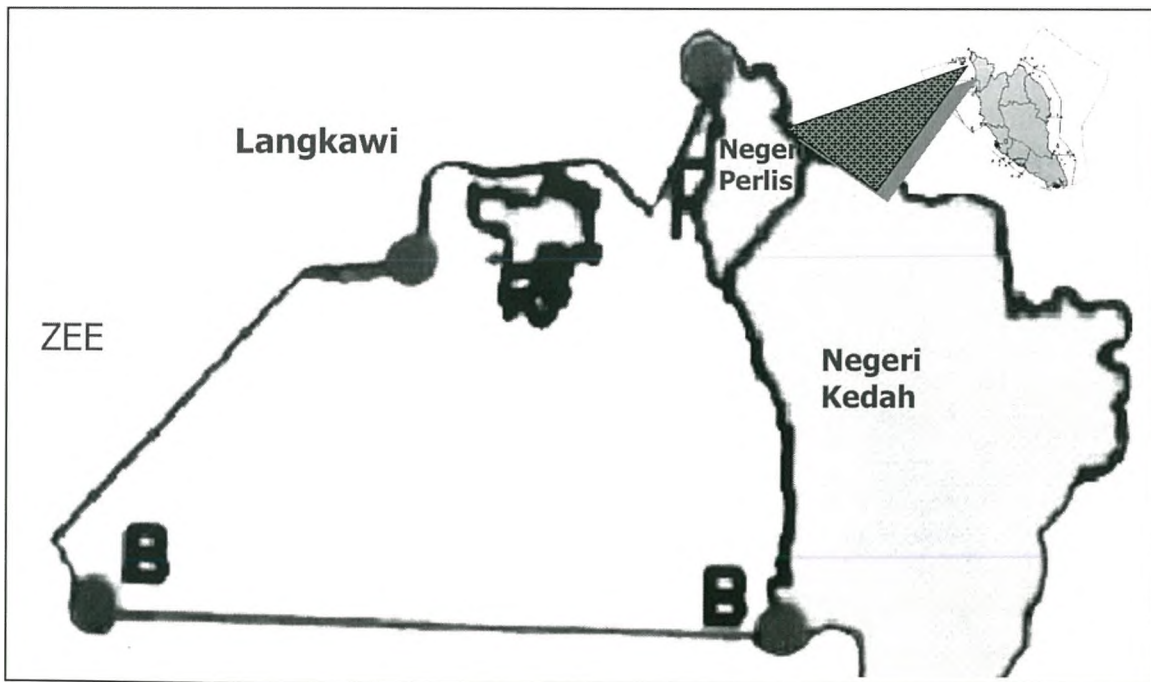


Figure 2: Map showing the States of Perlis and Kedah on the northern part of the west coast of Peninsular Malaysia

Table 1: Contribution of trawl landings in the States of Kedah and Perlis to the total landings for the States and for the country in 2001

	Total landings (mt)	Trawl landings in Kedah & Perlis		
		Landings (mt)	% to State	% to National
Perlis	48,790	18,273	37	4
Kedah	72,210	39,160	54	6
West Coast Peninsular	489,026	296,735	-	61
Malaysia	1,231,289	675,957	-	54

Table 2: Marine landings by type of catches in the States of Kedah and Perlis from 1968 to 2000

	Landings (x 1000 mt)						Total
	Demersal	Pelagic	Anchovy	Prawn	Cephalopod	Shellfish	
1968	9.50	34.64	2.49	.72	.30	.22	57.07
1970	9.89	16.50	6.33	.77	.38	.25	43.65
1972	23.96	12.68	4.48	1.80	.73	.01	66.91
1974	28.14	16.50	5.74	4.26	1.52	.00	82.77
1976	29.31	15.13	6.48	6.05	3.75	1.11	87.41
1978	41.02	18.33	7.30	9.34	4.89	.13	117.15
1980	92.76	49.27	20.61	10.02	5.94	2.31	267.74
1982	87.68	58.87	34.03	13.25	6.29	4.58	286.11
1984	49.22	70.99	21.54	6.12	4.56	3.59	200.71
1986	51.77	37.80	11.82	4.71	5.53	1.73	159.59
1988	36.34	45.71	17.96	8.03	4.76	.70	145.08
1990	50.72	45.15	16.56	9.19	7.62	3.38	175.71
1992	44.05	37.49	11.52	15.47	8.12	6.58	159.15
1994	41.47	44.51	10.25	5.99	4.26	2.84	146.52
1996	51.76	37.80	11.82	4.71	5.53	1.73	159.59
1998	36.34	45.71	17.96	8.03	4.76	.70	145.08
2000	58.55	48.01	8.81	9.06	7.01	2.37	185.35

Table 3: Number of licensed fishing gear and number of fishers working on licensed fishing vessels in the States of Kedah and Perlis in 2001

	Licensed Fishing Gear			Fishers on Licensed vessels		
	Total	Trawl	%	Total	Trawl	%
Perlis	553	231	42	5,127	1,173	23
Kedah	1,249	486	39	5,331	1,783	33
West Coast P.M.	12,966	3,039	23	31,242	9,177	29
Malaysia	31,681	6,064	19	84,496	23,567	28

Table 4: Number of licensed Zone B trawlers in the States of Kedah and Perlis in 2001

State	Licensed Trawlers		
	Total	Zone B (20 GRT)	% to total
Perlis	231	155	67
Kedah	486	405	83

This pilot study on development of indicator/s for the sustainable development and management of fisheries is focused on Zone B trawlers which are allowed to operate only in the area outside 12 nm from the coast off the States of Perlis and Kedah.

Pilot Project Implementation

Planned Activities for 2002 - 2003

1. The project started in January 2003 with the implementation of several activities under the planning stage. The activities included preparation of the project proposal, assessment of the status of the fisheries resources in the study area and preparation for paper presentation. Two major milestones in this stage are the conduct of Expert Consultation Conference and the formation of National Steering Committee for management of coastal fisheries in the country.
 - a. The Expert Consultation Conference on fisheries management was conducted in collaboration with WorldFish Center and was held from 11-12 March 2003 in Kuala Lumpur. This conference was attended by 61 participants representing various government agencies, universities and NGOs. Among the key conclusions are there is excess capacity in the coastal waters and there is an urgent need to implement comprehensive action programs to reduce fishing capacity and rehabilitation of the resource. The use of indicator/s for management was strongly encouraged by the conference.
 - b. The National Steering Committee on Management of Coastal Fisheries in the country was formed as one of the suggested immediate actions, during the conference. The Committee comprises representatives from FDAM (Fisheries Development Authority of Malaysia), MIMA (Malaysian Institute of Maritime Affairs), WorldFish Center and MoA and chaired by Deputy Director General of the Department of Fisheries Malaysia (DOF). The task of the committee is to oversee activities implemented towards the management of coastal fisheries, including the indicator project.
2. The Core-group Meeting on the use of indicators was conducted from 23-26 June 2003 to prepare the scope, framework, criteria, objectives, potential indicators and reference points for Zone B trawl fisheries in Kedah and Perlis. The 20 members of the group comprised both researchers and managers from DOF.
3. The National Expert Meeting to review the proposed indicators identified by the Core-group was held from 15-16 July 2003. The experts included researchers, managers and officials from various agencies related to fisheries in the Kedah and Perlis. The meeting finalized the scope, framework, criteria, objectives, potential indicators and reference points for trawl fisheries in Kedah and Perlis. The output was presented at the first Stakeholders Consultative Workshop.

4. The First Stakeholders Consultative Workshop was held from 25 - 26 August 2003. About 60 persons participated in the workshop. Half this number comprised stakeholders. The Workshop finalized the potential indicators and agreed to update information for all the selected potential indicators to be presented during the Second Stakeholders Consultative Workshop before testing the "best" ones.
5. A socio-economic survey on Zone B trawl fishermen in Kedah and Perlis was conducted jointly with FDAM from December 2003 - February 2004. A total of 443 respondents were interviewed based on a wide spectrum of questions from status of social standing, income, understanding on fisheries management, *etc.*
6. An environment and resource survey in the Zone B (12-30 nm) off Perlis and Kedah was done using commercial trawlers in February 2004.

Preparation of Draft Management Plan for Pilot Project

Current management measures under Department of Fisheries Malaysia as a sole management authority in the country.

1. Laws and regulations

The introduction of the trawl in the sixties led to the formulation of Fisheries Act 1963. The Act provided a comprehensive legal framework to manage the fisheries in Malaysian waters. It was replaced by the Fisheries Act 1985 which is the most recent Act implemented to develop, conserve and control marine fishing and marine fisheries resources. This Act incorporates the topic of the Exclusive Economic Zone so as to be consistent with relevant provisions in the 1982 Law of the Sea. The objective of this Act is to provide for better conservation, management and development of fisheries in Malaysia.

The Fisheries Act 1985 provides the minister of Agriculture with powers to make regulations for the management and conservation of marine resources. A number of fisheries regulations that have been made include among others are the following:

- a. Fisheries (maritime) Regulations 1967
This regulation provides the procedure for the application of licences for different types of fishing appliances, fees, deposits and conditions attached to such licenses.
- b. Establishment of Marine Park and Marine Reserves Order 1994
The waters around at least 48 islands in the Malaysian fisheries waters have been gazetted as Marine Parks. Fishing and collection of fish and other aquatic animals in these gazetted areas are prohibited.
- c. Fisheries (Prohibition of Methods of Fishing) Regulations 1980
This regulation prohibits unsustainable fishing practices such as bombing of fish, use of poisons and electric fishing, pair trawl, beam trawl and drift gill nets of more than 10 inches for catching rays.

2. Licensing

The license for fishing, for both the vessel and the gear, is used as a mechanism to limit entry into fishing. Presently there are 1,248 fishing vessels and fishing gears licensed in Kedah and there are 576 licensed fishing vessels and fishing gears in Perlis. Under the existing policy, there will be no new licenses to be issued for coastal fishing. There are several controls imposed on licensing, these include;

- i). Ownership pattern
 - ii). Change of ownership
 - iii). Owner operators are not allow to own more than one vessel.
 - iv). Transfer/movement between base/state
 - v). Size of vessel built
 - vi). Engine capacity
 - vii). Renewal of license
 - viii). Fishermen registration
3. Zoning of fishing areas
- The zoning of fishing areas is used as management measure to prevent conflicts between the traditional and commercial fishermen and in order to protect the breeding grounds. The zoning is as follows:
- i). Zone A Waters 5 miles from the coast for vessels operating traditional gear and these vessels are free to fish in all zones.
 - ii). Zone B Waters 5 miles from the coast for trawlers and purse seiners of the size <40 GRT.
 - iii). Zone C waters of > 12 miles from the coast for trawlers/purse seiners of the size 40 to <70 GRT
 - iv). Zone C2 waters of > 30 miles from the coast for trawlers/purse seiners of the size > 70 GRT.
4. Protected/Prohibited areas
- Sensitive areas especially coral areas are normally gazetted as marine parks. Among the prohibited activities in marine parks are fishing, spear gun fishing, collection of corals, shell and other marine organisms, collected of sand, dead coral/shell, Littering and polluting, Anchoring and boating over coral areas and constructing or erecting any building or other structure.
5. Prohibition of certain fishing gears/activities
- Basically all gears/activities destructive to fish and habitat are prohibited. This also include environmentally not friendly gears such as push net, pair trawl, use of explosive, electricity and Moro ami.
6. Rehabilitation of habitat
- Habitat rehabilitation is mostly targeting on producing artificial reef to make the ecosystem more productive.

Objectives for Management

The long term management objective for trawl fishery in the coastal area is to sustain the production at the present level. This is important in order to meet the national obligation on ensuring enough supply of fish in the future. This can be achieved through optimizing fishing capacity to match sustainable use of the stock.

Current State of Stakeholder Involvement

Management of fisheries is the responsibility of the Department of Fisheries. However, the stakeholders are consulted from time to time on management issues and the mitigation measures taken.



Photo 1: The 1st. National Stakeholders Workshop for the development of indicators for the sustainable development and management of trawl fisheries in Zone-B off the states of Kedah and Perlis, 26-27 August 2003

Conclusions

Faced with increasing pressure in coastal land development, environmental deterioration and over-exploitation of natural resources, it is inevitable that management of the fisheries sector will be a challenging task. From this pilot project perspective, the use of indicators together with development of management plan would of course be inevitable. The successful in identifying the right indicators for sustainable development and management, particularly in this very important coastal area will facilitate Department in playing her very vital role in ensuring there are fishes for future generations.

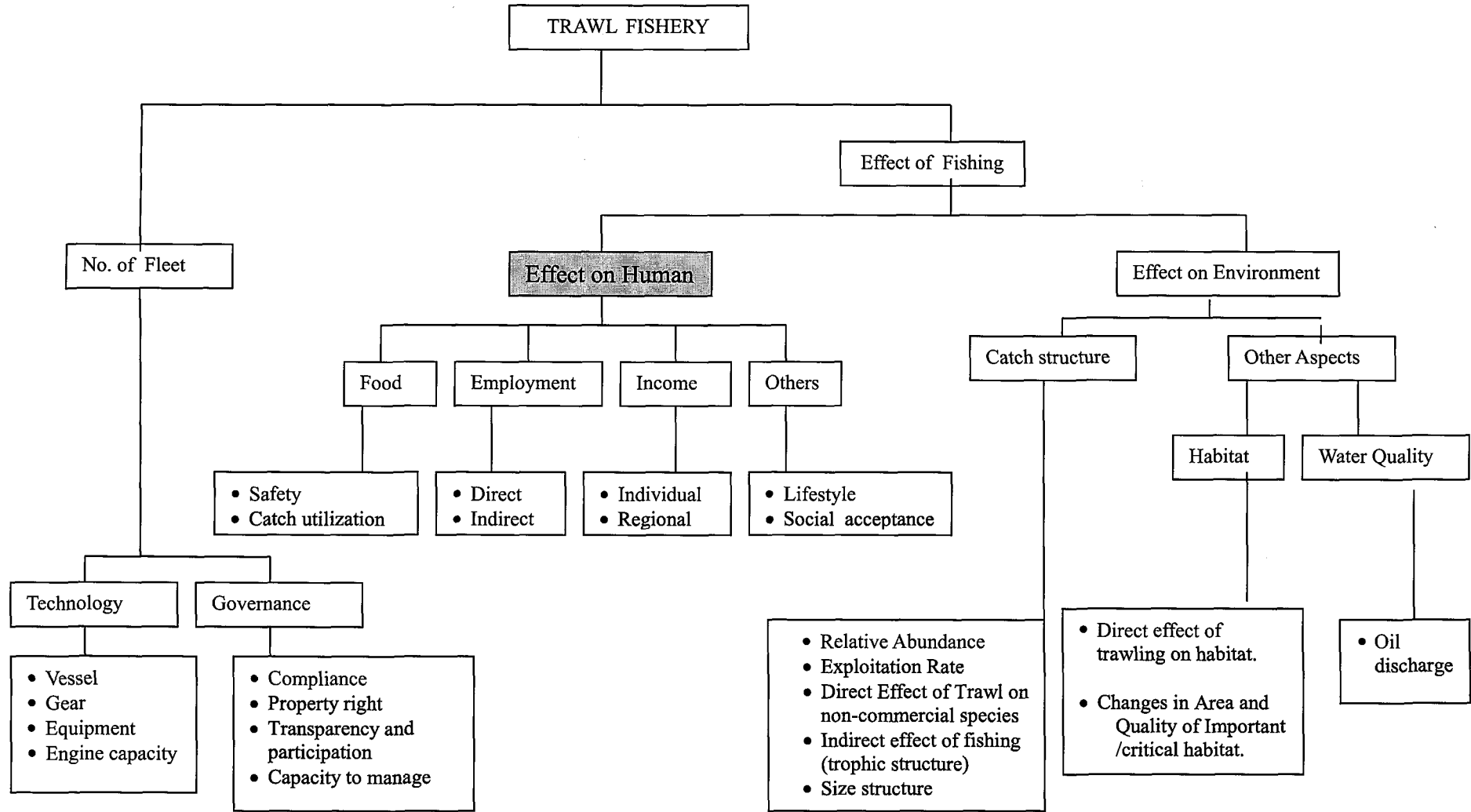


Figure 3: Trawler fleet and components for the effect of trawl fishery on human and on environment

Appendix 1

Selected indicators for fisheries management - List of proposed indicators presented to the stakeholders

a). Fleet/fishing capacity component.

Indicators	Meaning (C/T) ¹	Expected effect on fishing	Potential reference point (C/T) ²	Exclusiveness (Yes/No/ NR)	Measurable (+) / data requirement
1. Number of vessel	C	Yes	Optimum Effort (T)	NR	+
2. Size of vessel (GRT)	C	Yes	Optimum Effort (T)	NR	+
3. Engine capacity (HP)	C	Yes	Optimum Effort (T)	NR	+
4. Number of fishing time (days/year)	C	Yes	Optimum Effort (T)	NR	+
5. Number of Crew	C	Yes	Maximum No. of crew	-	+
6. Age of vessel	C	Yes	C	No	+
7. Number of gear	C	Yes	Optimum effort	No	+
8. Type of gear a. Shrimp b. Fish	T	Yes	Optimum effort	No	No. of shrimp & fish gear require
9. Echo-sounder	C	Yes	No. of vessel	NR	+
10. Global Positioning System	C	Yes	No. of vessel	NR	+
11. Type of engine a. Recondition b. Marine	T	Yes	-	No	Require
12. Engine capacity (HP)	C	Yes	No	No	+
13. Number of illegal (Vessel)	C	Yes	Ratio No. of Operation: No. License, 1:1	No	+
14. Number of illegal (Gear)	C	Yes		No	Require data no. of illegal gear
15. Number of encroachment	T	Yes	-	No	No. of encroachment, arrested, offences recorded
16. Effective communication between stakeholder	C	Yes	No record of conflict	No	-
17. Transparency of fisheries management	C	Yes	Less no. of illegal activities	No	Require data
18. Involvement of major stakeholder in fisheries management	C	Yes	Less no. of illegal activities	No	Require data No. of meetings/stakeholder
19. Resources availability at all level (Human)	C	Yes	-	No	+
20. Resources availability at all level (Asset)	C	Yes	-	No	+

¹C= Common Sense, ¹T=Theoretical basis, ²C=Comparative, ²T=Theoretical

b). List of socio-economic indicators that might be effected by trawl fishery in Zone-B off the states of Kedah and Perlis

Indicators	Meaning (C/T)	Expected effect of fishing	Reference point	Exclusiveness	Measurability (P=Priority)
Objective: Improve the socio-economic well being		Criteria: Individual income			
1. B/C ratio for vessel	C	Subject to stock situation	e1	Yes	Require data (P)
2. Production cost	C	Subject to stock situation	< average price of catch	Yes	Require data (P)
3. Owner income	C	Subject to stock situation	> poverty level	Yes	Require data (P)
4. Owner cum skipper income	C	Subject to stock situation	> poverty level	Yes	Require data (P)
5. Skipper income	C	Subject to stock situation	> poverty level	Yes	Require data (P)
6. Crew income	C	Subject to stock situation	> poverty level	Yes	Require data (P)
7. Share of fishing income to total income: <ul style="list-style-type: none"> [Owner [Owner cum skipper [Skipper [Crew 	C	Subject to stock situation	>50%	No	Require data (P)
Objective: Improve the socio-economic well being		Criteria: Regional contribution			
1. Contribution of focus group landings to focus area landings in terms of quantity	C	Subject to stock situation	>30% (to be improved using past trend)	Yes	+ (P)
2. Contribution of focus group landings to focus area landings in terms of value	C	Subject to stock situation	>30% (to be improved using past trend)	Yes	+ (P)
3. Contribution of focus group landings to the west coast trawlers landings in terms of quantity	C	Subject to stock situation	>30% (to be improved using past trend)	Yes	+ (P)
Objective: Improve the socio-economic well being		Criteria: Direct employment			
1. No. of people employed	C	Subject to stock situation	Past 5 years trend	Yes	+ (P)
2. % of local to total no. of fishermen	C	Subject to stock situation	100%	Yes	+ (P)
Objective: Improve the socio-economic well being		Criteria: Social standing			
1. % of fishermen who own houses	C	-	e50%	No	Require data (P)
2. % of fishermen who own land	C	-	e50%	No	Require data (P)
3. % of fishermen who own vehicles	C	-	e20%	No	Require data (P)
4. Literacy rate of fishermen	C	-	100%	No	Require data (P)

5. % of fishermen who attained at least SRP education	C	-	e20%	No	Require data (P)
6. % of graduate children from fishing family	C	-	e10%	No	Require data (P)
7. % of fishermen with saving/investment	C	-	e50%	No	Require data (P)
8. % of fishermen who take loan related to fishing	C	-	-	Yes	Require data (P)
9. % of fishermen who are able to fully repay their fishing loan installments	C	-	e50%	No	Require data (P)
10. Average household income per member	C	-	Above poverty level	No	Require data (P)
┌ Owner					
┌ Owner cum skipper					
┌ Skipper					
┌ Crew					
Objective: Improve social capital		Criteria: Social acceptability			
1. Zone B trawlers by the non -trawlers community in the same area	C	-	e50%	Yes	Require data
2. Illegal trawlers by licensed Zone B trawlers	C	-	e50%	Yes	Require data (P)
3. Illegal trawlers by non -trawlers community in the same trawlers	C	-	e50%	Yes	Require data
4. % of fishermen who are members of Fishermen Association	C	-	100%	Yes	Require data (P)

c). List of resources and environmental indicators that might be effected by trawl fishery in Zone-B off the states of Kedah and Perlis

Indicators (1)	Meaning (C/T)(2)	Expected Effect of Fishing (3)	Potential Reference Point (4)	Exclusiveness (Yes/No)(5)	Measurability (+)/ Data required (6)
Objective 1: To maintain biodiversity					
1. Catch Composition	C	To be determined	First Survey Data in area <input type="checkbox"/>	-	+
2. Indicator Species	C	Increase	<input type="checkbox"/>	No	+
3. Total Biomass/ Abundance	T/C	Decrease	T	No	+
Objective 2: To reduce overfishing and over capacity in the study area.					
4. Catch per unit effort	C	Decrease	<input type="checkbox"/>	No	+
5. Exploitation Rate (E)	T	Increase	<input type="checkbox"/> (0.5)	Yes	+
Objective 3: To maintain a healthy fish stock					
6. Size Spectrum	T	Fewer Large Fish -less total biomass	<input type="checkbox"/>	-	+
Objective 4: To reduce the non commercial component of the catch					
7. Percentage of Non -Commercial/ Unmarketable spp in the catch	C	Increase	<input type="checkbox"/>	Yes	+, additional length frequency data
Objective 5: To maintain the structure of food web.					
8. Mean Trophic Level	T	Decrease	<input type="checkbox"/>	-	Diet of all species & their prey
Objective 6: To reduce the effect of trawling on the quality & quantity of benthos, substrate, critical habitat					
9. Change in Benthos Composition and Abundance	C	Decrease	<input type="checkbox"/>	No	- benthos composition
10. Change in Bottom Characteristics	C	-	<input type="checkbox"/>	No	Long series of bottom profiles
Note : (2) C = Common Sense T= Theoretical Basis (4) <input type="checkbox"/> = Comparative Data T= Theoretical					

Appendix 2

List of proposed and accepted indicators by the stakeholders and their agreement to contribute in data collection

a). Fleet/Fishing capacity component

No.	Objective	Indicator	Reference Point	Data required	Data Supplier
1	To sustain fishing capability to the level that produces sustainable fisheries development.	1. Number of Zone-B Trawlers	Number of Zone-B Trawler in the present year (2003)	Number of licensed Zone-B trawler	Management Div. DoF
		2. Trawler size (GRT)	Trawler size in 2003	GRT of licensed trawlers	DoF state offices
		3. Engine capacity (HP)	Trawlers HP in 2003	HP of licensed trawlers	DoF state offices
		4. Number of haul per trip	Number of haul per trip in 2003	Number of haul per trip	Zone-B Trawler operators
2	To increase acceptance to fisheries rules and regulations among the zone-B trawlers.	1. Number of unlicensed vessels	Zero	Number of unlicensed vessels	DoF and Fishermen Association
		2. Number of Zone-B trawlers violating license conditions	10% of the total number of Zone-B trawlers	Number of Zone-B trawlers violating license conditions	DoF enforcement unit
		3. Acceptance of existing management regulations by the Zone-B trawlers.	100%	Number of Zone-B trawlers violating management regulations	DoF
		4. Number of enforcement exercises conducted in Zone-B area	16 days per months	Number of enforcement exercise	DoF enforcement unit.

b). Socio-economic indicators

No.	Objective	Indicator	Reference Point	Data required	Data Supplier
1.	Improve the socio-economic well being Individual income	1. B/C ration for vessel	=> 1	Survey	Joint survey DoF & Fishermen Association (FA)
		2. Average production cost	< Average value of the catch	Survey	Joint survey DoF & FA
		3. Owner income	> National poverty level	Survey	Joint survey DoF & FA
		4. Owner cum skipper income	> National poverty level	Survey	Joint survey DoF & FA
		5. Skipper income	> National poverty level	Survey	Joint survey DoF & FA
		6. Crew income	> National poverty level	Survey	Joint survey DoF & FA
		7. Share of fishing income to total income: <ul style="list-style-type: none"> <input type="checkbox"/> Owner <input type="checkbox"/> Owner cum skipper <input type="checkbox"/> Skipper <input type="checkbox"/> Crew 	> 50%	Survey	Joint survey DoF & FA
2.	Improve the socio-economic well being Regional contribution	1. Contribution of focus group landings to focus area landings in terms of quantity	> average of the past 5 years	Annual Statistics	DoF
		2. Contribution of focus group landings to focus area landings in terms of value	> average of the past 5 years	Annual Statistics	DoF
		3. Contribution of focus group landings to the west coast trawlers landings in terms of quantity	> average of the past 5 years	Annual Statistics	DoF

3.	Improve the socio-economic well being Direct employment	1. No. of people employed	Average for the past 5 years	Annual Statistics	DoF
		2. No. of Zone-B trawl fishermen to total no. of fishermen in the area	> 30%	Annual Statistics	DoF
4.	Improve the socio-economic well being Social standing	1. % of fishermen who take loan related to fishing	-	Survey data	DoF & FA
		2. % of fishermen who are able to repay their fishing loan installment according to schedule	50%	Survey data	DoF & FA
		3. Household per capita income per member: - Owner - Owner cum skipper - Skipper - Crew	> national poverty level	Survey data	DoF & FA
5.	Improve the socio-economic well being Social standing	1. % of fishermen who own houses	=> 50%	Survey data	DoF & FA
		2. % of fishermen who own land	=> 50%	Survey data	DoF & FA
		3. % of fishermen who own vehicles	=> 20%	Survey data	DoF & FA
		4. Literacy rate of fishermen	100%	Survey data	DoF & FA
		5. % of fishermen who attained at least SRP education	=> 20%	Survey data	DoF & FA

		6. % of graduate children from fishing family	> 10%	Survey data	DoF & FA
		7. % of fishermen with saving/investment	=> 20%	Survey data	DoF & FA
6.	Improve the socio-economic well being Social acceptability	1. Zone B trawlers by the non-trawlers community in the same area	> 50%	Survey data	DoF & FA
		2. Illegal trawlers by licensed Zone B trawlers	> 50%	Survey data	DoF & FA
		3. Illegal trawlers by non-trawlers community in the same trawlers	> 50%	Survey data	DoF & FA
		4. % of Zone-B trawl fishermen who are willingly move to other fishing zones.	> 50%	Survey data	DoF & FA
		5. % of fishermen who are members of Fishermen Association	> 100%	Survey data	DoF & FA

a). Resources and environmental indicators

No.	Objective	Indicator	Reference Point	Data required	Data Supplier
1	To maintain biodiversity.	1. Catch Composition	Catch composition of: - the 1 st survey conducted in the area & - the commercial landing at the early stage of trawl fishing	- Total catch (weight) - Catch composition (weight)	DoF Surveys FA records
		2. Indicator Species			
		3. Total Biomass/ Abundance	- Total biomass and density of the 1 st survey in the area	- Total catch and trawl log	DoF survey
2	To reduce over fishing & over capacity in the study area.	1. Catch per unit effort(CPUE)	CPUE of the 1 st survey in the study area	Catch & effort	DoF survey
		2. Exploitation rate (e)	$E \leq 0.5$	CPUE, biomass, M	DoF survey
3.	To maintain a health fish stock	1. Average size of fish	Average size of fish during the 1 st survey conducted in the area	Size of fish	DoF survey Commercial landing (FA)
4.	To reduce non commercial component of the catch	1. Percentage of trash fish in the catch	% of trash of the 1 st survey	Total & trash catch	DoF survey
5.	To maintain the structure of food web	1. Trophic level	Trophic level obtained from the 1 st survey conducted in the area.	Survey data	DoF survey
6.	To reduce the effect of trawling on the quality & quality of benthos, substrate and critical habitat	1. Changes in benthos composition and abundance	Benthos composition and abundance of the earlier study in the area	Benthos data	DoF survey
		2. Changes in bottom characteristics	Bottom characteristics obtained in the earlier study	Particle size	DoF survey

*** Appendix 1: Project Information**

Name of National Technical Project Officer: Mr. Abu Talib b. Ahmad

Other project team members: Mr. Ahmad Saktian b. Langgang (Fleet/Fishing Capacity)
Mr. Sallehuddin b. Jamon (Resource)
Ms. Lim Chai Fong (Socio-economy)
Mr. Ahmad Adnan b. Nuruddin (Socio-economy/Database)
Ms. Halimah bt. Mohamed (DataBase)

Date of project initiation: March 2003

Planned project duration: 3 years (2003 -2005)