



PROGRAM DOCUMENT

- 1. Program Categories** : Programs under the ASEAN-SEAFDEC FCG Mechanism
- 2. Program Title** : - Coastal Resources Management
- Special 5-year Program (SDI-4 Resources Enhancement)
- 3. Project Title** : Locally Based Coastal Resources Management
in Pulau Langkawi (LBCRM -PL)
- 4. Lead Department** : SEAFDEC Training Department
- 5. Lead Country** : Malaysia
- 6. Total Duration** : 2 years (August 2003 to July 2005)
- 7. Proposed 2003 Budget** : USD35,000 under Coastal Resources Management
USD10,000 under the SDI-4 Resource Enhancement

TD/RP/64

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ABBREVIATIONS

01. AR : Artificial reef
02. CBFM : Community-based Fisheries Management
03. DOF(M) : Department of Fisheries (Malaysia)
04. FAD : Fish aggregating device
05. FAL : Fishermen's Association Langkawi
06. FCG : Fisheries Consultative Group under the ASEAN-SEAFDEC regime
07. FRI : Fisheries Research Institute
08. ICC : Implementation Coordination Committee
09. JKKK : Village Level Security Committee
10. KEN : Kampung Ekonomi Nelayan – Fishermen's Economic Group
11. LADA : Langkawi Development Agency
12. LBCFM-PD : Locally Based Coastal Fisheries Management in Pathew District
13. LBCRM-PL : Locally Based Coastal Resources Management in Pulau Langkawi
14. LKIM : Lembaga Kemajuan Ikan Malaysia – Malaysia Fisheries Development Authority
15. MFRDMD : Marine Fishery Resources Development and Management Department of SEAFDEC
16. NEKMAT : National Fishermen's Association
17. PDM : Project Design Matrix
18. PIWG : Project Implementation Working Group
19. RM : Malaysian Ringgits (1 US\$ is equivalent to 3.64 RM)
20. SC : Steering Committee
21. SEAFDEC : Southeast Asian Fisheries Development Center
22. SK : State Kedah
23. TD : Training Department of SEAFDEC

1. INTRODUCTION

The deterioration of livelihood in coastal fishing communities as a result of the over-exploitation of fishery resources and the degradation of coastal environments has led the Thai government to introduce the concept of community-based fisheries management (CBFM) within the framework of coastal fisheries development and coastal fisheries management. Another important factor being the pressure to decentralize and devolve administrative authority to local actors – a successful example of this being the joint DOF and Bay of Bengal Project (BOBP) Phannga Bay project, set up in 1996. Another example was the 1989 DOF Fishing Rights Pilot Project (FRPP) in Bang Saphan and Bang Saphan Noi District. Following these successes the DOF decided to start a new coastal fisheries management project in Chumpon Province as an integrated component of the comprehensive development project implemented by the Royal Project Council.

Under the Fisheries Consultative Group's (FCG) scheme adopted by the Southeast Asian Fisheries Development Center (SEAFDEC), it was decided in 2001 that the Training Department (TD) would collaborate with the DOF to implement a coastal resource management program, and an existing project proposal in Chumpon was reformulated as a joint initiative with a duration of five years. Thailand was posited in the project as the lead country among SEAFDEC Members and TD was the implementing department of SEAFDEC. It was intended that the knowledge and experience to be gained through the project operation would be disseminated to other member countries through the SEAFDEC information transfer mechanism.

Thus, the project commenced in October 2001 in Chumpon. It has produced a tangible impact and was acknowledged by the Members at the 4th SEAFDEC FCG Meeting in Myanmar in March 2002 and the 25th PC Meeting in Singapore in October 2002. The latter meeting pointed out that it was time to impart technologies, including the experience and knowledge gained, to other Member countries, and the Committee Member for Malaysia offered Langkawi as a pilot site on a cost-sharing basis for the implementation of a similar approach. Malaysia had earmarked USD 20,000 as a contribution for this project.

Several SEAFDEC/TD missions to Langkawi were subsequently mounted to look into the possibility of setting up a similar coastal fishery resources management and development project, the resulting project is named "Locally Based Coastal Resources Management – Pulau Langkawi (LBCRM – PL)".

2. PROJECT AREA AND TARGET GROUPS

The project site is Langkawi Island (Pulau Langkawi), Langkawi District, Kedah State, where over 3,000 fishermen are engaged in various types of fishing using over 1,200 fishing vessels. The number of fishing vessels and fishermen are listed in the table of Annex 12. The target groups are all fishermen and their families in four KENs: Kuala Teriang, Kampong Kilim, Pulau Tuba and Pasir Hitan. The project will begin in the KEN in Kuala Teriang and move on to the other three as time permits. The present status of Kuala Teriang KEN is described at length in Annex 2.

The primary beneficiaries will be fishers dependent upon access to coastal fishery resources. Men, women and children will benefit from increased and stabilized fish production through enhanced

fishery resources, improved organizational and management skills at community level, increased awareness and understanding of sustainable natural resource use through participation in community resource management and through environmental education activities. The final objective is for the Fishermen's Association and the KENs to be able to plan and execute their LBCRM at a local level within the framework of the national Fisheries Act and with the participation of local fishers.

3. PROJECT MANAGEMENT AND OPERATIONAL FRAMEWORK

3.1. General regime

As described in the organization chart of the project management in Annex 4, the major agency in the project implementation is the Department of Fisheries (DOF) Malaysia and SEAFDEC/TD acts as a collaborating agency within the regional collaborating framework. The Fisheries Development Authority Malaysia (LKIM) and the State of Kedah act as the primary supporting agencies, while SEAFDEC/MFRDMD will contribute technical support. In fact, pre-project activity began in November 2001 when the DOF organized the four KENs in Pulau Langkawi. Therefore, the DOF runs the project as it was and SEAFDEC/TD provides technical support based upon knowledge gained from the on-going project LBCFM-PD in Chumpon, Thailand, and with financial support within the budgetary contribution of co-financing. The DOF, Thailand is also involved in the operation in a consultative capacity within the regional technical exchange scheme network in SEAFDEC.

From the SEAFDEC/TD side, the Resources Enhancement Project (SDI-4), Special 5-year program on Sustainable Fisheries for Food Security in the ASEAN Region, has made a financial contribution of USD 10,000 (2003). The SDI-4 had its plan to test the applicability of FADs and ARs and their impact on natural resources in Malaysia. As the current major concern in LBCRM in Langkawi is the applicability of FADs and ARs and their management, some components in the project activities are duplicated, especially in Activity No2, Rehabilitation and Enhancement of Coastal Resources. Hence, a part of the activities in SDI-4 was merged into the main project LBCRM-PL.

3.2. Project Implementation Working Group (PIWG)

The Working Group to run the day-to-day project operations is organized by the District DOF office in Bukit Malut, Pulau Langkawi. It consists of the Head of the District DOF (Local Project Coordinator), the Head of the Fishermen's Association, the Chairman of the KEN and the Chairman of the Village Level Security Committee. Two JICA Senior Volunteers (JICA SV) also participate as advisors when their services are required. The Langkawi Fishermen's Association supported by four KENs will become more involved in the planning and implementation of LBCRM and at the final stage of the project they will have full responsibility as the core management organization. The TOR are shown in Annex 5.

3.3. Implementation Coordinating Committee (ICC)

As dealt with in the Terms of Reference (TOR) for ICC in Annex 6, an Implementation Coordinating Committee is established with the primary function of coordination with agencies and

establishments at state/district levels. The structure is defined in Annex 4 and the Chairperson of the Committee is the Director of the State Fisheries Office.

3.4. Steering Committee (SC)

As dealt with in the Terms of Reference for SC in Annex 7, a Steering Committee is established with the primary function of discussing and deciding policy issues and matters pertinent to project operation and coordination among all institutions involved at the central level. The structure is shown in Annex 4, the committee being presided over by the National Project Coordinator Malaysia (Director of Planning and Development Division, DOF Malaysia). The National Project Coordinator for Thailand also participates in this committee.

4. PROGRAM

4.1. Objectives

The overall goal of this project is to provide technical assistance to ensure sustainable development of coastal fishery communities in Pulau Langkawi within the collaborative project framework.

The main objectives of the project are sustainable coastal resources management at local level, the rehabilitation of coastal resources and the alleviation of poverty. To achieve these, the project conducts activities in three major areas: a CBFM approach, a resources enhancement approach and a job creation approach.

4.2. Outputs

During the project period, resources will be mobilized to achieve the following outputs:

1. Baseline survey data and relevant information obtained
2. Increased or stabilized fish production in use of FADs/ARs
3. Improved income and living conditions at the project site through an integrated approach.
4. Optimum level of fish harvest by improved fishing technology
5. Resource users and other stakeholders can use the coastal resources in a sustainable manner
6. Enhanced human capacity of the local population and participatory organizations like KEN and Fishermen's Association in resources management and community development activities.

4.3. Activities

To produce the above outputs, the following activities will take place during the project period. The outline of the project implementation plan is shown in the table of Annex 8. The timing of execution of each activity is indicated in the chart of Annex 9 and the detailed action plan for 2003 is shown in the table of Annex 10. The total matrix of the project design and operation is shown in the Project Design Matrix (PDM) of Annex 12.

The project operation will be confined only to the KEN in Kuala Teriang among the other four KENs during the initial stages of the project tenure. It may move to the next KEN in Kampong Kilim after being assured on the impact given by the initial operation in Kuala Teriang.

Activity 1: Baseline survey

1.1. Verification of existing data

Several socio-economic and marine biological baseline surveys have already been conducted. To avoid duplication, verification of the existing data will be carried out jointly with SEAFDEC/TD and DOFM staff in Langkawi and missing information will be identified.

1.2. Preliminary baseline survey

After identification of the missing data, a preliminary baseline survey will be carried out by the Project Implementation Working Group (PIWG). SEAFDEC/TD staff will provide technical support in designing the survey content, methodology and data analysis.

After the completion of the preliminary survey, deliberations should be held on whether a further supplemental survey should be conducted.

The fish landing and fishing efforts survey will be continued intermittently throughout the project term (fish landing data has been regularly collected by the Marine Statistics Section of the District DOF).

1.3. Study on the impact of FADs and ARs installation and management

The major concern for fishery resources management in Langkawi is the impact caused by the installation of FADs and ARs. These will be monitored jointly by FRI and SEAFDEC/TD (SDI-4 Project Team).

Activity 2: Rehabilitation and enhancement of coastal resources

These activities are carried out in close association with community-level fishery resources management mechanisms, jointly by DOFM/FRI and SDI-4 of SEAFDEC/TD to prevent further loss of habitat and damage to fish stock..

2.1. Deploy artificial reefs (ARs)

SEAFDEC/TD will assist DOFM to design and install ARs in collaboration with any other member countries with new FADs technology, and to monitor the marine biological impact.

2.2. Deploy fish aggregate devices (FADs)

SEAFDEC will assist the DOFM to carry out the environmental and marine biological impact surveys for existing FADs and, based upon that, prepare management plans, which may be incorporated in the CBFM plan.

Activity 3: Promotion of local business

The project works with the public and private sectors to diversify employment and minimize post-harvest losses at all levels.

3.1. A quick review of local business

KEN members have initiated novel products that are reviewed according to economic feasibility, technical viability, sustainability, contribution to the community etc. Results are incorporated in the future products development plan.

3.2. Introduce and expand job opportunities

Efforts are being made to introduce various alternative employment opportunities, like eco-tourism and diversified fish culturing, to reduce pressure on fisheries resources. Before a scheme is promoted, a brief feasibility study should be undertaken and an investment plan be drawn up.

3.3. Improved fish handling/processing

A study of fish handling practices (on-board and onshore) is carried out by the Project Implementation Working group (PIWG) and new and improved technologies are introduced.

LKIM plans to contribute some funds, estimated at RM300,000, for the construction of a jetty that will be conducive for minimizing post harvest loss and facilitating fish marketing. The project will be able to take advantage of this input in the improvement program of fish handling and processing.

Activity 4: Fishing gear technology improvement

4.1. Study the current fishing practices in the use of FADs/ARs in Langkawi

A team from the SEAFDEC/TD Fishing Gear Section will visit and carry out a study jointly with the DOFM on current practices in use of FADs/ARs of fishing prevailing in Langkawi to identify improvement needs.

4.2. Introduction of improved fishing technologies

Based upon the findings of the above study, improved fishing gear and technologies will be firstly tried out jointly with SEAFDEC/TD and DOFM with local fishers, and after being assured on the effect these will be introduced to the local fishing communities. To assess technical effectiveness, marine biological impact and economic advantage of the newly introduced fishing technology, regular monitoring should be continued.

Activity 5: Encourage and extend locally based fishery resources management

5.1. Formulation and introduction of a local fishery resources management plan

A self-regulatory fisheries resources management plan in the use of FADs/ARs will be drawn up by PIWG with the participation of the beneficiaries and based upon an analysis of the available data and on disputes among fishermen. This calls for an increase in the institutional capacity of the Fishermen's Association and the awareness level of fishermen for CBFM, and this will be achieved toward the end of the project. This is one of the core activities.

Activity 6: Enhancement of human resource capability and participation

This is one of the most important activities, although it requires hard work. Unless the capacity of institutional as well as human resources is improved at all levels, an effective and participatory CBFM system cannot function in a sustainable manner.

6.1. Reinforcement of the structure and capacity of existing KENs and Fishermen's Associations

The structure of existing target groups, KENs and LFA that are central to the CBFM concept, is reinforced through activities including informal education and training, study tours, exhibitions and workshops. It is important to set interventions at the correct level and a flexible training program throughout the length of the project will be developed.

6.2. Presentation of the results of the baseline surveys to local communities

The results of all baseline surveys and other relevant information will be presented to the local communities. A training workshop on data management and analysis will be held to enable communities to make informed policy choices.

5. INPUTS AND FUNDING

To pursue the above activities, the following inputs will be made within the cost sharing arrangement.

SEAFDEC/TD side (Allocation for 2003)

Contribution in kind

- Under the LBCFM-PD budget allocation - Japanese Trust Fund	:	USD 35,000 ¹
- Under FCG/SDI-4	:	USD 10,000

Man power

- SEAFDEC/TD Technical Team consisting of 7 staff in the fields of Socio-economics, Marine Biology and Oceanography
- JICA Expert Socio-economist

Training

- Seminar, training courses and study tours

Facilities, equipment and materials

- Field training kits
- Extension materials (texts, manuals and audio-visual aids)

Others

- Traveling cost for DOF Thailand representatives relating to the project operation

SEAFDEC/MFRDMD side

Manpower

- Marine Biologists/Oceanographers as required

¹ The detailed budget breakdown is listed in the table of Annex 11.

DOF Malaysia side

Contribution in kind

- Cost sharing

:

USD 20,000

Manpower

- District DOF staff in Langkawi
- FRI Marine Biologist and Oceanographer
- JICA Snr. Volunteer Fish Processing
- JICA Snr. Volunteer Marine Cage Culture

Facilities, equipment and materials

- Project contact point and office space
- Construction & installation of FADs and ARs

Others

- Local transportation
- Miscellaneous local expenses

6. MONITORING AND EVALUATION

The Project Implementation Coordinating Committee will undertake regular monitoring on the project operation and will be held on a 3-4 months cycle.

Based upon the regular monitoring and evaluation, the project work plan can be amended, if necessary, subject to endorsement by the Steering Committee.

The mid-term project evaluation will be take place in coincidence with the Steering Committee meeting to be summoned one year after project commencement. The final project evaluation will be conducted 6 weeks before project termination.

Annex 1

SECTORIAL CONTEXT IN MALAYSIA

1. Fisheries industry

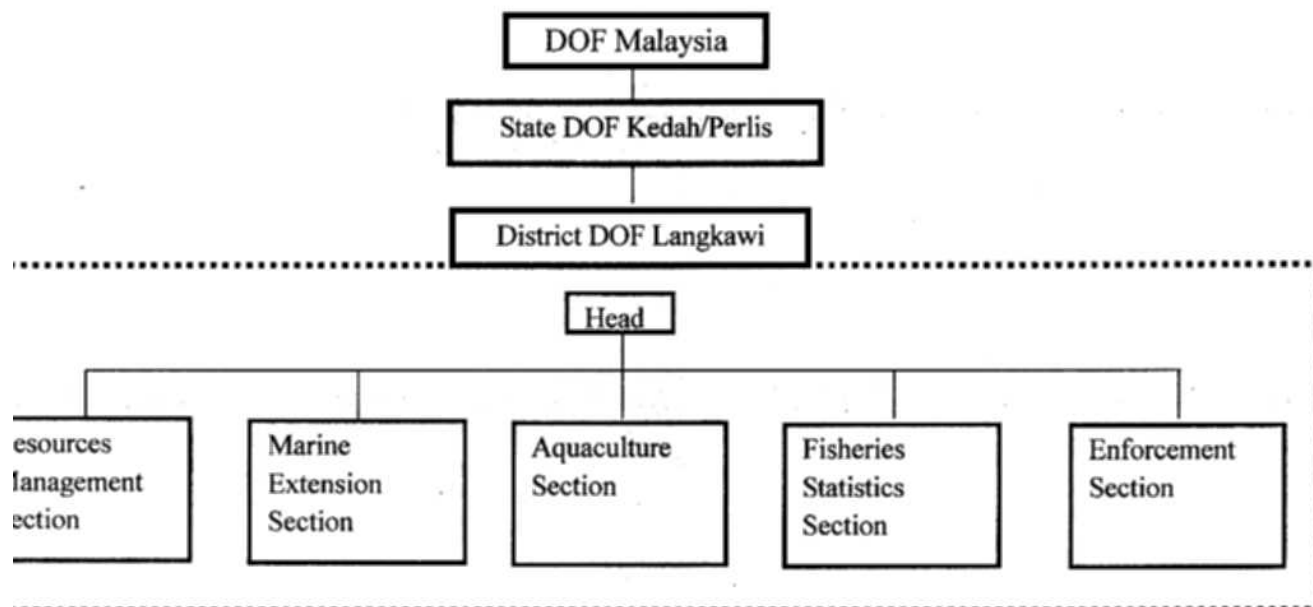
Malaysia ranks 17th in the world for annual fish production, harvesting 1,234,733 tons² in 2001. The fisheries industry is an important industry, contributing 1.66% of GDP. Fish constitutes 60 – 70% of the protein intake and the per capita annual fish consumption is about 49kg (2000).

There are 83,952 registered fishermen and 21,104 fish culturists (2000)³, accounting for over 1.3% of the eligible workforce. In 1999 there were 34,051 fishing vessels in operation, out of which some 80% were classified as traditional vessels. 57.9% of the fisherman work on traditional fishing vessels, while the rest are engaged in licensed commercial fishing. In 1999, the number of fishermen, boats and landings increased by 2.95%, 3.60% and 4.85% respectively in comparison to 1998.

Fishing methods in Malaysia vary from traditional - stake nets, push nets and barrier nets - to modern - trawling, purse seining and long lining. Marine fisheries are classified into three categories: inshore, offshore and distant water and fishermen are classified as traditional or commercial.

2. Fisheries administration

Under the Department of Fisheries, Ministry of Agriculture (MOA), there are 12 State Fisheries Offices in Malaysia. The State Fisheries Office in Kedah/Perlis is in Alor Setar. In Langkawi, there is a District Fisheries Office in Bukit Malut comprising five sections as shown in the following guide



² FAO Statistics Year-Book 2001

³ Fisheries Statistics of Malaysia

In the District Fisheries Office Langkawi, 26 working staff have the following titles.

1. Head, District Fisheries Office Langkawi (1)
2. Dpt. Fisheries Officer, Resources Management Section (1)
3. Dpt. Fisheries Officer, Marine Extension Section (1)
4. Dpt. Fisheries Officer, Aquaculture Section (1)
5. Dpt. Fisheries Officer, Fisheries Statistic Section (1) – stationed in Alor Setar
6. Snr. Dpt. Fisheries Officer, Enforcement Section (1)
7. Dpt. Fisheries Officer, Enforcement Section (1)
8. Crew for two patrol boats (19)

3. Malaysia Fisheries Development Authority (LKIM)

The Fisheries Development Authority of Malaysia (Lembaga Kemajuan Ikan Malaysia – LKIM) was established as an independent and separate agency under the umbrella of the MOA to promote commercial activities in fisheries, including the organization of fishermen's associations.

The major activity in the LKIM Langkawi is the operation of open cage culturing with 3 staff.

Fishermen's Associations

There are 77 Fishermen's Associations in Malaysia and 12 State Fishermen's Associations which uphold the National Fishermen's Association (NEKMAT).

The Fishermen's Association Langkawi was organized under the LKIM in January 1983 and the number of members by fishing village is shown below. As appears in the list, 1,748 fishermen are registered as members. The annual membership fee is only 1RM per member.

Members of Fishermen's Association Langkawi by village
(As of August 2003)

No.	Name of Village	Licensed fishing zone				Total
		A	B	C	C-2	
01	A/Hangat Dan Sekit	175	7	4	7	193
02	Bukanbumiputra	1	0	0	0	1
03	Ewa Dan Sekitarnya	67	16	5	1	89
04	Kelibang Dan Sekit	73	47	12	18	150
05	Kedawang Dan Sekit	225	14	12	15	266
06	Kilim Dan Sekitarn	59	4	6	6	75
07	K/Teriang Dan Sekit	170	29	14	36	249
08	Kuan Dan Sekitarnya	197	38	20	31	286
09	P/Tuba Dan Sekitar	296	14	10	8	328
10	U/Melaka Dan Sekit	66	23	10	12	111
Total:		1,329	192	93	134	1,748

Sauce of data: Fishermen's Association, Langkawi

The major activities of the Association are;

1. The sale of diesel oil to fishing vessels at a subsidized rate of (0.76RM/ltr. against 0.79RM/ltr.),
2. Undertaking civil work contracts,
3. Agro-tourist business in the use of Kelong (fish trapping devices),
4. Home-stay program with fishermen's families,
5. Distribution of fish fry for marine cage culture.

The General Manager leads the Association with 7 staff mainly engaged in administrative work. Out of these the GM and a secretary are paid by the KLIM, the others being self-financed.

4. Fisheries policy and legislation

4.1. Basic outline of fisheries legislation

Under the 1985 Fisheries Act of Malaysia, fishing zones legislation is as follows.

Category	Fishing zone (distance from the coast line)	Permissible fishing vessels to operate
A	0 to 5 n. miles	Artisanal fishing boats under 20 GRT
B	5 to 12 n. miles	Commercial fishing vessels 20-40 GRT
C	12 to 30 n. miles	Commercial fishing vessels 40-70 GRT
C-2	30 to 200n.miles	Commercial fishing vessels over 70 GRT

4.2. Towards co-management

Until the arrival of the British in the 18th Century, village heads and communities were responsible for fishing activities and resource management in Malaysia according to unwritten village laws of custom. The British replaced these with the Western type of open access fisheries management system under which the central government became the sole authority on all aspects of the fisheries industry and all fishermen, boats and gear had to be licensed.

The 1985 Fisheries Act confirmed the DOF as the sole authority managing fisheries resources, fishermen, fishing vessels and all fishing activities. However, the Government has recognized that open access resources management is no longer appropriate and has changed to a co-management approach similar to Japan's. Some pilot LBCRM initiatives have been set up in certain parts of Malaysia.

One successful case is in Pulau Perhentian, where fishery resource management and community development, including tourism, are harmonized. The design and execution of all resource management plans is conducted when consensus is reached following discussions among all stakeholders. This concept of co-management was given a boost when it was included in the third National Agriculture Policy (NAP-3) as one of the sustainable management strategies in natural resources.

In 1998, the DOF began to establish Fishermen's Economic Groups (Kampung Ekonomi Nelayan – KENs) in small coastal fishing communities alongside existing Fishermen's Associations (under the jurisdiction of the Fisheries Development Authority), as sub-groups of the Fishermen's Associations. The KEN brings together fishermen who use the same type of fishing gear in the same fishing ground and live in the same fishing village or neighborhood. It focuses on community development including the self-management of coastal fishery resources.

A KEN is set up when the District Extension Officer in the District Fisheries Department Office identifies a fishermen's group willing to co-operate and to contribute funds and time to carry out the activities of the KEN. If the potential membership reaches 30, a proposal is submitted to the State DOF Extension Officer to forward to the Director of the national Extension and Training Division. Once the proposal has been approved, the process of the establishment of a KEN begins, including financial support from the DOF. So far, four KENs have been established in Langkawi.

The KEN is self-governing, with its own constitution, and is non-partisan. The committee meets regularly and DOF covers the cost of training and study tours for members encompassing subjects including cooperative management, business orientation and technical skill training in the fields of fishing boat hulls and engine maintenance, fish handling and ice making.

ANNEX 2

PRESENT STATUS OF KUALA TERIANG KEN

The KEN in Kuala Teriang

The Kuala Teriang KEN was the most successful of the four in management, operation and activities. It was established in November 2001 with 50 members from three villages (Kuala Teriang Kampung, pop.119; Kuala Melaka, pop. 154; and Batu Ara pop. 336) who were mainly engaged in crab trapping, line and driftnet fishing. Membership has risen to 67 and the KEN has a Chairman, Vice-chairman, Secretary, Treasurer, Auditor and 10 Committee Members, all of whom are elected. Under the General Committee, there are three sub-committees: The Economic Sub-committee, The Women's Sub-committee and The FAD/Security Sub-committee, which support various commercial activities like selling ice and lubricating oil, marketing catches, a joint venture in cage culture with a local private company, M.K.Trading, and sports fishing for tourists. The KEN has also built a restaurant on the main road that is managed by the Women's Sub-committee.

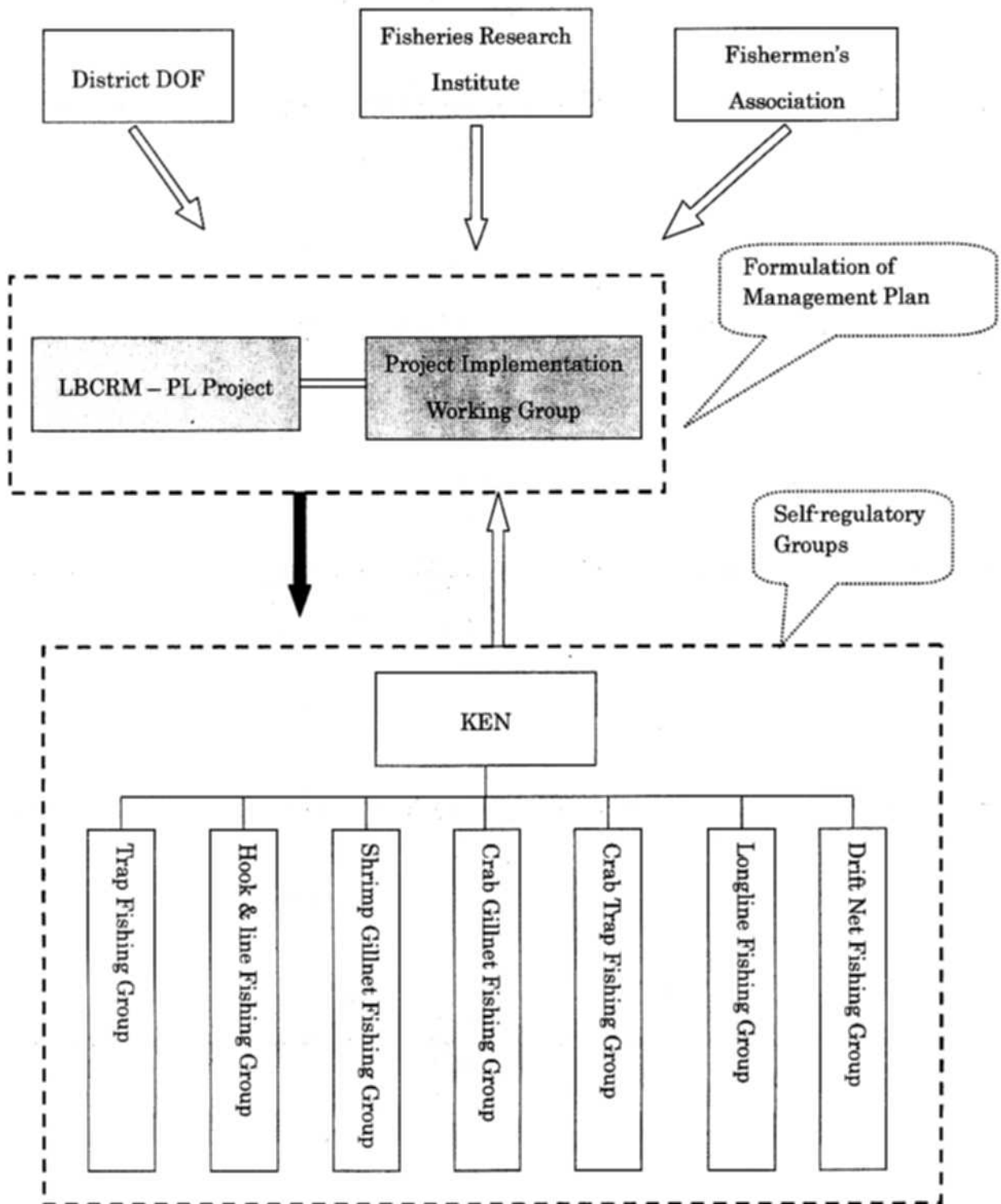
The annual membership fee is 5RM and a cooperative share may be obtained by eligible members at 100RM each. The DOF has provided financial support in the form of a block-ice making machine with a capacity of 320Kg /day and nine sets of 200 liter insulated ice boxes on a two-year free lease. In addition, both the DOF and LKIM jointly contributed 24,000RM and 82,000RM respectively to build two sets of FADs. The KEN recently completed its office building thanks to a 45,000RM contribution from the Member of Parliament.

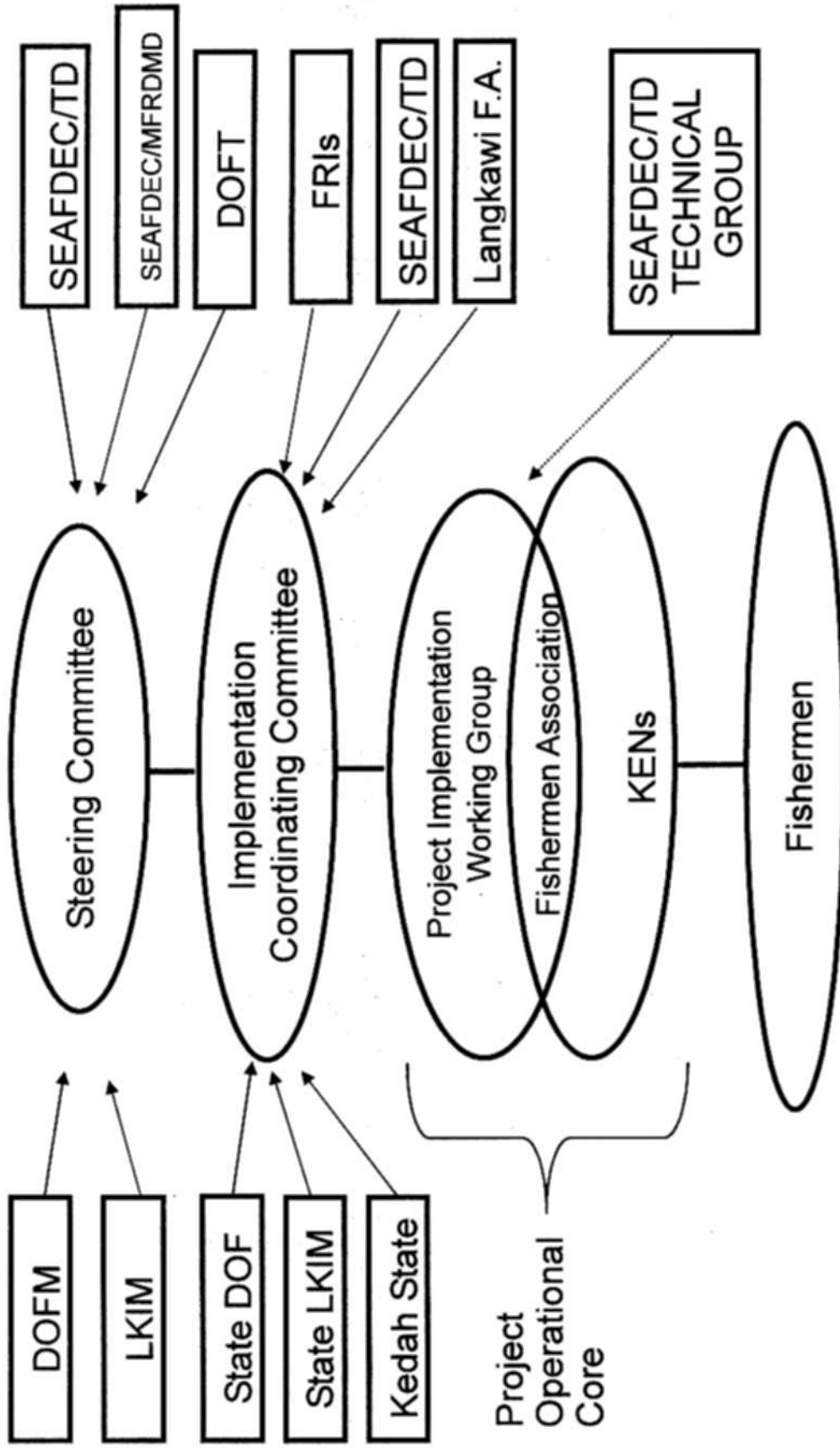
Two sets of modern type FADs were constructed under the technical guidance of the DOF with funding from the DOF and LKIM. These were installed 4.0 and 4.8 nautical miles from the shore. With the permission of the DOF, there are also a number of smaller and traditional FADs installed in the area by small groups of fishers. According to their customary law, which is strictly observed, no fishing is allowed near the FADs except hand line fishing. The FADs have proved to be a useful structure not only for aggregating and sheltering fish schools but also preventing encroachment by commercial trawlers. In addition, the DOF encouraged the KEN to conduct sports fishing activity management around the FADs as an alternative source of income for members.

The KEN entered into a joint-venture agreement with a local private company to manage an open cage culture. Ten sets of modern fish culturing cages were built with technical guidance from the DOF. Fish stocking began in March 2003. The site was allocated by the DOF on a temporary annual lease of 45RM/acre. Currently small groupers caught by fish traps are stocked for 3 to 7 months until they reach marketable size (from 500 to 700g).

Annex 3

Framework of Locally Based Coastal Fisheries Management





Annex 5

TERMS OF REFERENCE

Project Implementation Working Group for LBCRM-PL

A. Title of the Project: Locally Based Coastal Resources Management- Pulau Langkawi (LBCRM-PL)

B. Duties:

- a. To propose and implement other economic activities and improve fish marketing facilities, improve fish handling techniques and encourage fish based processing activities
- b. ensures successful implementation of the project
- c. problem solving at the local level of the project implementation
- d. reports to the ICC.

C. Membership:

- a. Head of Fisheries District Office (Chairman)
- b. Chairman of the area Fishermen Association in Langkawi
- c. Chairman of the Fishermen Economic Group Kuala Teriang
- d. Officers from the FRI and MFRDMD/SEAFDEC
- e. Representatives from SEAFDEC/TD
- f. Extension Officers , Langkawi Fisheries District Office
- g. Head, Village Security committee (JKKK)

Non-permanent Member:

Other representative should be decided by the chairman as and when needed.

D. Frequency of the meeting

The project implementation working group should meet at least once in two months.

Annex 6

TERMS OF REFERENCE

Implementation Coordinating Committee for LBCRM-PL

For the purpose of coordinating implementation activities, the Implementation Co-ordinating Committee will be established with the following duties:

- A. **Title of the Project:** Locally Based Coastal Resources Management- Pulau Langkawi (LBCRM-PL)
- B. **Duties:**
- a. to supervise, monitor and evaluate the implementation of the project at the state level
 - b. to prepare progress reports of the project as required by the Steering Committee every 6 months
 - c. to prepare a project work plan and budget allocation for approval by the Steering Committee
- C. **Membership:**
- a. Director of State Fisheries Office, Kedah
 - b. Director of State Fisheries Development Authority of Malaysia, Kedah
 - c. Kedah State Economic Planning Unit
 - d. Chairman of the area Fishermen's Association
 - e. Relevant agencies under the Ministry of Agriculture
 - f. Head, Fisheries District Office of Pulau Langkawi
 - g. Fisheries Research Institute
 - h. MFRDMD/SEAFDEC
 - i. NAPFRE, Pulau Sayak
 - j. SEAFDEC/TD
- D. **Frequency of the meeting**
The ICC should meet at least 4 times a year

TERMS OF REFERENCE

Steering Committee for LBCRM-PL

For the purpose of initiating and promoting a collaborative project between DoF Malaysia and SEAFDEC/TD under the FCG, a steering committee will be established with the following duties:

- A. Title of the Project:** Locally Based Coastal Resources Management- Pulau Langkawi (LBCRM-PL)
- B. Duties:**
- a. To decide on policy issues pertaining to the implementation of the project
 - b. To guide the project strategy and the direction of the project implementation
 - c. To review and endorse the project work plan and the budget allocation
 - d. To monitor and evaluate project progress
 - e. To coordinate among all institutions involved in the project operations
 - f. To report the progress to the SEAFDEC/Secretariat and respective agencies
 - g. To assign technical officers for the project.
- C. Membership:**
- a. Director of Planning & Development, DOF, Malaysia KL (National Coordinator)
 - b. SEAFDEC National Coordinator for Thailand
 - c. Chief, SEAFDEC/TD
 - d. SEAFDEC Resource Enhancement Project Leader
 - e. Section Head of Socio Economic Division
 - f. JICA Expert Socio Economist assigned to SEAFDEC/TD
 - g. Director, Extension & Training Division, DOF Malaysia, KL
 - h. Representative from the Fisheries Development Authority Malaysia, Kuala Lumpur
 - i. Chief, SEAFDEC/MFRDMD
- Non-permanent Members:
- a. Ministry of Agriculture Malaysia
 - b. State Director, Fisheries State Office, Kedah, Alor Setar
 - c. State Director, Fisheries Development Authority, Kedah
 - d. Leader of LBCRM-Chumporn Project
 - e. Director, Fisheries Research Institute, Penang
 - f. Chief, AQD/SEAFDEC, Philippines
- D. Frequency of the meeting**
The steering committee should meet at least twice year.

Annex 8: Outline of the Project Implementation Plan – LBCRM - PL

- 1. Project title & code : Locally Based Coastal Resources Management – Pulau Langkawi (LBCRM – PL)
- 2. Executing agency : Department of Fisheries Malaysia (DOFM), Ministry of Agriculture
- 3. Collaborating agency : SEAFDEC/TD
- 4. Supporting agency : Fisheries Research Institutes (FRI), DOFM, Ministry of Agriculture, SEAFDEC/MFRDMD, LKIM (Fisheries Development Authority Malaysia), Ministry of Agriculture, District DOF / Fishermen’s Association Langkawi (FAL)
- 5. Operational Organization : SEAFDEC/TD under the FCG scheme
- 6. Source of budget : SEAFDEC/TD under the FCG/SDI-4 DOFM (cost sharing)
- 7. Duration of Project : 2 years
- 8. Starting date : August 2003
- 9. Work Plan

Activity	Responsible party	Period		Remarks
		Starting	Ending	
Preparatory arrangement of the Project 1. Preparation of action plan/project document - Draft tentative action plan - Deliberation and approval on a tentative plan - Draw up an action plan - Draft a project document	TD	06.2003	06.2003	BKK
	TD & DOFM	07.2003	07.2003	Langkawi
	TD	07.2003	07.2003	Including a revised budget requirement
	TD	08.2003	10.2003	To be approved by SC
2. Establish a project management and Implementing mechanism	TD & DOFM	07.2003	12.2003	Organization of a Steering Committee (SC) & Implementation Coordinating Committee(ICC)
3. Organization of the LBCRM Project structure	TD, DOFM	12.2003	01.2004	(The first Steering Committee was held in Langkawi on 11 July 2003.)
4. Proposal for revised budget requirements	TD	07.2003	07.2003	Project Implementation Working Group(PIWG) to be organized to carry out the day-to-day activities Submission to the Trust Fund Manager
Project evaluation 1. Mid-term project evaluation 2. Terminal project evaluation	SC	09.2004	09.2004	During the Steering Committee Meeting
	SC	07.2005	07.2005	During the Steering Committee Meeting

Activity	Responsible party	Period		Remarks
		Starting	Ending	
1. Base line survey				
1.1. Verification of existing data	TD, DOFM, MFRDMD, FRI	08.2003	09.2003	TD team visits Langkawi, FRI and MFRDMD to verify existing data and identify needs for preliminary surveys after thorough deliberations
1.2. Preliminary base line surveys	TD, FRI, DOFM, MFRDMD	09.2003	07.2005	After completion of the preliminary survey, it should be discussed based upon the outcome of whether a supplemental survey should be carried out. If judged necessary, it will be conducted subsequently. Fish landing & fishing efforts surveys continue intermittently throughout the project term
1.3. Study on the impact of FADs and ARs installation and management	TD/SDI-4, FRI, DOFM, MFRDMD	08.2003	07.2005	The study on the impact caused by the installation of FADs/ARs in Langkawi to be carried out by the TD/SDI-4 team in collaboration with DOFM staff
2. Rehabilitate and enhance coastal resources				
2.1. Deploy artificial reefs (ARs)	DOFM, SDI-4, FRIP	08.2003	07.2005	Design, construct and install ARs, monitor the effectiveness and assess the impact
2.2. Deploy fish aggregating devices (FADs)	DOFM, SDI-4, FRIP	09.2003	07.2005	Asses the impact of existing FADs and, based upon that, prepare management plans for FADs and subsequent actions if necessary.
3. Promotion of local business				
3.1. A quick review of local on-going business	TD, FAL, DOFM	01.2004	11.2003	All local businesses currently in operation by KEN are subject to a quick review from the view points of commercial and technical viability or degrees of contribution to the society
3.2. Introduce and expand job opportunities	TD, DOFM, FAL	03.2004	07.2005	To alleviate over-capitalization in capture fisheries and increased incomes in fishing communities in general, efforts should be exerted to introduce new ventures. Brief investment plans are to be prepared. Particular attention should be given to economic viability in case of take-off from cottage or backyard scale industries.
3.3. Improved fish handling /processing technologies	TD, FAL, DOFM, KLIM	03.2004	07.2005	A study to be conducted for prevailing fish handling practices and any improvements necessary and, consonantly, some measures should be undertaken for improvement.

Activity	Responsible party	Period		Remarks
		Starting	Ending	
<p>4. Fishing gear technology improvement</p> <p>4.1. Study the current fishing practices in use of FADs/ARs in Langkawi</p> <p>4.2. Introduction of improved fishing technology</p>	<p>TD, FRI, DOFM, FAL</p> <p>TD, FRI, DOFM, FAL</p>	<p>01.2004</p> <p>07.2004</p>	<p>04.2004</p> <p>07.2005</p>	<p>A team from the SEAFDEC/TD Fishing Gear Section will visit and carry out the study jointly with DOFM on current practices of fishing that prevail in Langkawi and in the use of FADs/ARs and identify improvement needs.</p> <p>Based upon the findings from the above study, improved fishing gear and technology will be firstly tried out with local fishers and after convincing of the effect these will be introduced to the local fishing communities. To assess technical effectiveness, marine biological impact and economic advantages, regular monitoring should be continued.</p>
<p>5. Encourage and extend locally-based fishery resources management (LBFRM)</p> <p>5.1. Formulation and introduction of a local fishery resources management plan</p>	<p>TD, DOFM, KLI M, FAL</p>	<p>08.2004</p>	<p>07.2005</p>	<p>Based upon the analyzed data and information, a self-regulatory fisheries resources management plan is to be drawn up with participation of the beneficiaries and to be introduced for practical application by each fishing group. The PIWG is responsible for formulation of a management plan.</p>
<p>6. Enhance human resources capability and participation</p> <p>6.1. Reinforcement of structure and capacity of existing KENs and Fishermen's Associations (FAL)</p> <p>6.2. Presentation of analytical results of base line surveys to local communities</p>	<p>TD, DOFM, KLIM, FAL</p> <p>TD, FRIP, DOFM</p>	<p>12.2003</p> <p>08.2004</p>	<p>07.2005</p> <p>07.2005</p>	<p>The structure of existing community based fisheries management core groups, KENs and FAL, should be reinforced enabling them to fulfill LBFRM related functions. Also, fisherman's education and training on the subject to be carried out through exhibitions, open dialogues, study tours, informal training courses etc.</p> <p>Analyzed data and information are presented to the communities for their own coastal resources management and community development planning</p>

Annex 9: Tentative Project Management and Implementation Chart

Activity	1st year												2nd year											
	2003						2004						2005											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Base line survey																								
1.1. Verification of existing data																								
1.2. Preliminary base line surveys																								
1.3. Study and data collection for environmental impacts by FADs and ARs installation																								
2. Rehabilitate and enhance coastal resources																								
2.1. Deploy artificial reefs (ARs)																								
2.2. Deploy fish aggregating devices (FADs)																								
3. Promotion of local business																								
3.1. Quick review on on-going local business																								
3.2. Improve fish handling / processing technologies																								
3.3. Introduce and expand job opportunities																								
4. Fishing gear technology improvement																								
4.1. Study the current fishing practices in use of FADs/ARs																								
4.2. Introduction of improved fishing technology																								
5. Encourage and extend locally-based fishery resources management																								
5.1. Formulation and introduction of a local fishery resources management plan																								
6. Enhance human resources capability and participation																								
6.1. Reinforcement of structure and capacity of existing KENs and Fishermen's Association																								
6.2. Restoration of analytical results of base line surveys to local communities																								
Project evaluation																								
- Mid-term project evaluation																								
- Terminal project evaluation																								
Committee Meeting																								
- Steering Committee																								
- Implementation Coordinating Committee																								

Action Plan for 2003

Date: 01.11

P

Activity	2003						Remarks
	7	8	9	10	11	12	
Base line survey.							
<u>1. Verification of existing data</u>							
1.1. Collection of socio-economic data existed		↔					
1.2. Verification of socio-economic data		↔					
<u>2. Preliminary base line surveys.</u>							
2.1. Organization of a socio-economic survey team				↔			
2.2. Designing and preparation of socio-economic survey sheets			↔				
2.3. Orientation to the survey team				↔			
2.4. Conducting socio-economic surveys				↔			
2.5. Compilation and analysis of data					↔		
2.6. Report publication						↔	
<u>3. Study on the impact of FADs/ARs installation</u>							
3.1. Collection of oceanographic and marine biological data pertinent to FAD/AR	↔						Jointly with SDI-4
3.2. Verification of the above data	↔						- do -
3.3. Designing and preparation of supplemental Oceanographic and marine biological survey pertinent to FAD/AR			↔				- do -
3.4. Conducting the above survey				↔			- do -
3.5. Analysis of the above data					↔		- do -
3.6. Report compilation and publication						↔	- do -
Rehabilitate and enhance coastal resources							
<u>1. Deploy artificial reefs (ARs)</u>							
1.1. Study tour by Malaysian scientists to inspect installation of ARs and FADs				↔			Under SDI
1.2. Install ARs					↔		
<u>2. Deploy fish aggregating devices (FADs)</u>							
					↔		Under SDI
Promotion of local business							
<u>1. A quick review of local on-going business</u>							
<u>2. Introduce and expand job opportunity</u>							
<u>3. Improve fish handling / processing technologies</u>							
Fishing gear technology improvement							
<u>1. Study the current fishing practices in use of FADs/FRs in Langkawi</u>							
<u>2. Introduction of improved fishing technology</u>							
Encourage and extend locally-based fishery resources management							
<u>1. Formulation and introduction of a local fishery resources management plan.</u>							
							Activity start in 2004
Enhance human resources capability and participation							
<u>1. Reinforcement of structure and capacity of existing KENs and Fishermen's Association</u>							
1.1. Workshop for fishermen on justification and implication of the project operation						↔	
<u>2. Restoration of analytical results of base line surveys to local communities</u>							
							Activity start in 2004

**Budget estimation for the component of LBCRM-PL
(2003)**

Activity	Month	Itemized expenditure line	Particulars of expenditure	Estimated cost (USD)	
				Cost breakdown	T. Cost
1. Base line survey					
1.1. Verification of existed data	August	Traveling	- to collect and verify data in Langkawi by 2 officers of TD	- Fixed traveling cost (2 ps. x \$460) - Variable traveling cost (2 ps. x 5 ds x \$90)	920 900 1,820
1.2. Preliminary base line surveys	Sept.	Traveling	- to carry out surveys jointly with DOFM by 3 officers of TD	- Fixed traveling cost (3 ps. x \$460) - Variable traveling cost (3 ps. x 5 ds. x \$90)	1,380 1,350 2,730
	Dec.	Workshop	- to discuss the preliminary result of survey by parties concerned	- Fixed traveling cost (10 Malaysian + 5 TD) - Variable traveling cost	1,600 3,427 5,027
	Dec.	Publication	- to publish the report with 300 copies	- Workshop cost - 300 pcs x \$4.8	500 1,440 1,440
1.3. Survey and data collection for environmental impacts by FADs and ARs	July	Traveling	- to carry out the preliminary surveys by 1 officer from RED/TD and 1 from DOFT	- Fixed traveling cost (2 ps. x \$460) - Variable traveling cost (2 ps. x 4 ds x \$90)	920 720 1,640
	Sept.	Traveling	- to conduct supplemental surveys by 1 officer from RED/TD and 1 from DOFT	- Fixed traveling cost (2 ps. x \$460) - Variable traveling cost (2 ps. x 4 ds x \$90)	920 720 2,160
	Oct.	Traveling	- conduct marine biological survey (3 TD staff)	- Fixed traveling cost (3 ps. x \$460) - Variable traveling cost (3 ps. x 5 ds x \$90)	1,380 1,350 2,730

Activity	Month	Itemized expenditure line	Particulars of expenditure	Estimated cost (USD)	
				Cost breakdown	T. Cost
2. Deploy artificial reefs(Ars) 2.1. Deploy artificial reefs	Nov.	Study tour	- to inspect AR installation in Pattani by 3 scientists	- Variable traveling cost (\$62 x 3ps. x 4ds.)	744
				- Fixed traveling cost (\$200 x 3ps.)	600
				- Misc. expenses for local arrangement	300
1,644					
6. Enhance human resources capability and participation 6.1. Reinforcement of structure and capacity of existing KENs and Fishermen's Association	Dec.	Workshop	- to conduct a project opening workshop with 50 participants	- Fixed travelling cost (5 ps. x \$460)	2,300
				- Variable traveling cost (5 ps. x 3 ds x \$90)	1,350
				- Workshop cost	850
4,500					
Committee Meeting - 1st Steering Committee Meeting	Jul.	Travelling	- to organize and hold the 1st SCM in Langkawi with 4 TD and 1 DOFT staff	- Fixed travelling cost (5ps. x \$460)	2,300
				- Variable travelling cost (5ps. x 4 ds. x \$90)	1,800
4,100					
- 2nd Steering Committee Meeting	Oct	Meeting/travelling	- to organize and hold the 2nd SCM in Phuket with 4 TD and 4DOFT staff	- variable traveling cost (8ps. x 3ds. x \$62)	1,488
				- Air tickets' cost (8 ps. x \$160)	1,280
3,268					
Total:				31,559	
Round to:				35,000	

Annex 12.

Numbers of fishing boats and fishermen by fish landing centre in Langkawi

(As of April 2000)

No.	Fish landing centre	Fishing boats /1 with L.T.engine	Fishing boat with I.B.engine	Anchovy P.S.boat	Number of fishermen
01	Penarak	50	-		55
02	Pkl. Kuah	40	8		70
03	Pokok Asan	-	7		30
04	Kelibang	36	1		50
05	Sg. Menghulu	30	1		50
06	Pkl. Tapa	40	-		45
07	Bukit Malut	150	-		200
	"			32	900
08	Kuala Temoyong	50	-		70
09	Telok Baru	40	15		100
10	Kuala Chenang	100	1		110
11	Kuala Kedawang	20	-		30
12	Kuala Melaka	100	4		200
13	Kuala Teriang	150	11		250
14	Tanjong Rhu	40	-		50
15	Pasir Hitan	20	-		30
	"			5	120
16	Telok Yu	40	-		80
17	Kubang Badak	35	-		70
18	Kilim	60	-		65
19	Kisap	15	-		30
20	Telok Apau	10	-		15
21	Belanga Pechah	12	2		20
22	Pulau Tuba	60	5		150
23	Lubuk Chempedak	25	-		50
24	Selat Bgn.Pauh	25	-		60
25	Selat Bagan Nyior	50	10		120
26	Telok Berembang	15	-		25
27	Selat Bagan. Asn	10	-		20
Total:		1,223	65	37	3,065

Source of data: District DOF, Langkawi

/1: Including out-board engines

Annex 13

PROJECT DESIGN MATRIX

PROJECT TITLE : Locally Based Coastal Resources Management – Pulau Langkawi (LBCRM-PL)

PERIOD : Two years (August 2003 – July 2005)

TARGET GROUP : Langkawi Fishermen's Association / KEN

TARGET AREA : Kuala Teriang, Pulau Langkawi, Kedah State, Malaysia

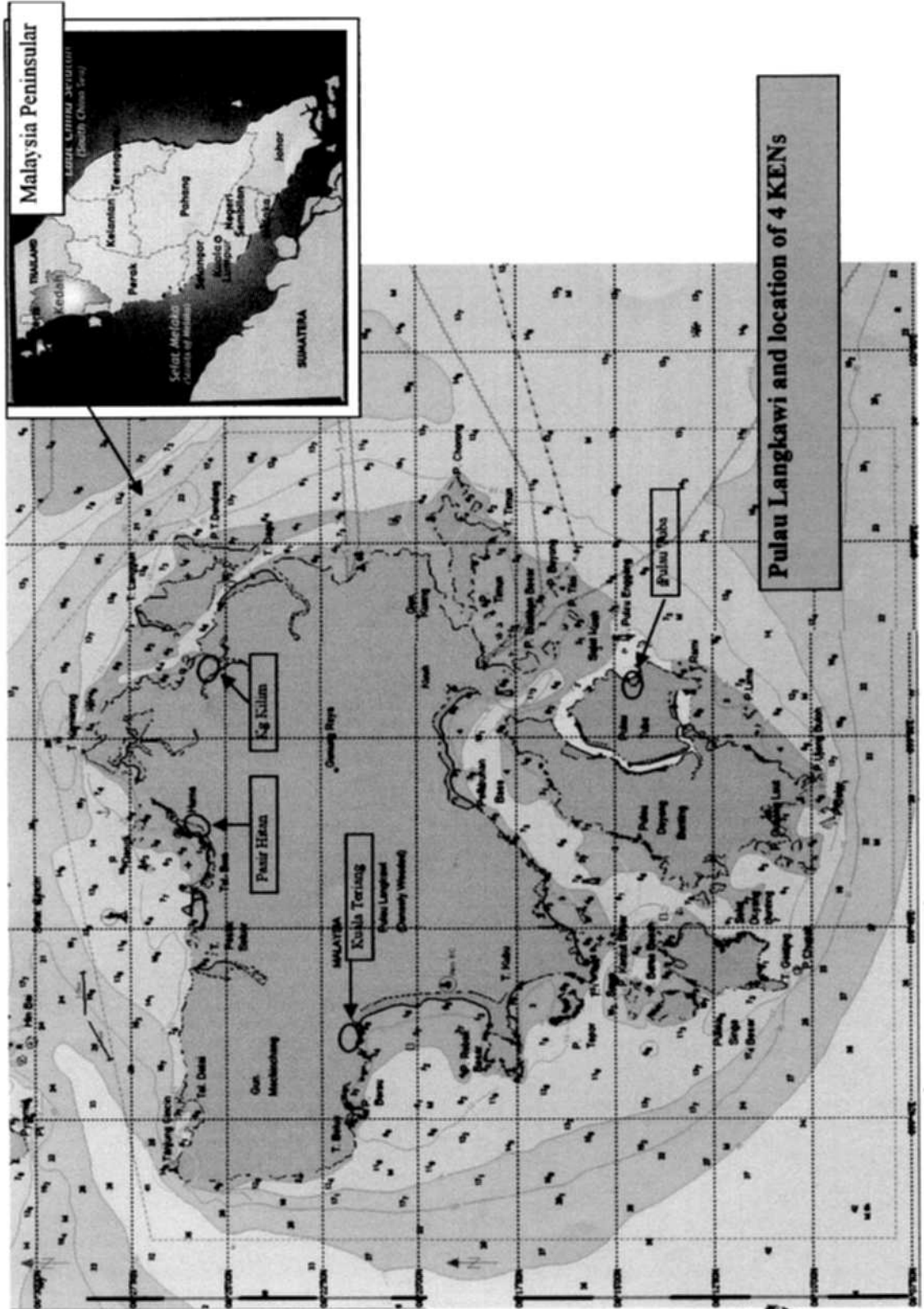
NARRATIVE SUMMARY	INDICATORS
<p>< OVERALL GOAL ></p> <p>01. Sustainable development of coastal fishery communities in Pulau Langkawi</p>	<p>1. Improvement of the average income in the fishing communities</p> <p>2. Diminished absolute poverty groups in the fishing communities</p>
<p>< PROJECT PURPOSE ></p> <p>1. To introduce a sustainable coastal resources management system at local level</p> <p>2. To rehabilitate coastal fishery resources</p> <p>3. To alleviate the poverty in fishing communities</p>	<p>1.1. Increased or stabilized fish landing in coastal fisheries</p> <p>1.2. Decreased cases of illegal fishing</p> <p>1.3. Decreased cases of conflict among fishers about fishing rights</p> <p>2. Increased or stabilized fish landing in coastal fisheries</p> <p>3.1. Increased income of fishers</p> <p>3.2. Fishers attend social activities.</p>
<p>< OUTPUTS ></p> <p>1. Obtained base line data and information</p> <p>2. Increased or stabilized fish production in use of FADs/Ars</p> <p>3. Improved income and living conditions at the project site by an integrated approach</p> <p>4. More economically effective, but eco-friendly, fishing operation by improved fishing technology</p> <p>5. Resources users and other stakeholders can use the coastal resources in a sustainable manner</p> <p>6. Enhanced human capacity of the local population and participatory organizations like KEN and Fishermen's Association in resources management and community development activities</p>	<p>1. Base line survey results are compiled and published</p> <p>2.1. Increased income of fishers</p> <p>2.2. Increased fish landing</p> <p>3. Increased income of fishers</p> <p>4. Optimum level of fish production</p> <p>5.1. Increased or stabilized fish landing in coastal fisheries</p> <p>5.2. Decreased cases of illegal fishing</p> <p>5.3. Decreased cases of conflict among fishers about fishing rights</p> <p>6.1. Resources management in coastal fisheries is planned locally.</p> <p>6.2. Coastal resources management is implemented locally.</p> <p>6.3. Increase awareness on CBRM among stakeholders</p> <p>6.4. Increased accessibility to multiplied information by fishers</p>
<p>< ACTIVITIES ></p> <p>1. Base line survey</p> <p>1.1. Verification of existed data</p> <p>1.2. Preliminary base line surveys</p> <p>1.3. Study on the impact of FADs and ARs installation and management</p> <p>2. Rehabilitate and enhance coastal resources</p> <p>2.1. Deploy artificial reefs (ARs)</p> <p>2.2. Deploy fish aggregating devices (FADs)</p> <p>3. Promotion of local business</p> <p>3.1. Quick review of local on-going business</p> <p>3.2. Introduce and expand job opportunities</p> <p>3.3. Improve fish handling / processing technologies</p> <p>4. Fishing gear technology improvement</p> <p>4.1. Study the current practices in use of FADs/Ars in Langkawi</p> <p>4.2. Introduction of improved fishing technology</p> <p>5. Encourage and extend locally-based fishery resources management</p> <p>5.1. Formulation and introduction of a local fishery resources management plan</p> <p>6. Enhance human resources capability and participation</p> <p>6.1. Reinforcement of structure and capacity existing KENs and Fishermen's Association</p> <p>6.2. Restoration of analytical results of based line survey to local people.</p>	<p>< INPUTS ></p> <p><u>SEAFDEC/TD side</u></p> <p><u>Contribution in kind</u></p> <p>– SEAFDEC/TD under S.P./SDI-4 : USD 10,000 (for 2003)</p> <p>– SEAFDEC/LBCFM-PD : USD 35,000 (for 2003 only)</p> <p><u>Manpower</u></p> <p>– JICA Socio-economist</p> <p>– Marine biologists</p> <p>– Socio-economists</p> <p>– Oceanographers</p> <p>– Marine biologists</p> <p><u>Training</u></p> <p>– Seminar, training courses and study tours</p> <p><u>Facilities, equipment and materials</u></p> <p>– Extension materials (text, manual and audio-visuals)</p> <p>– Field training equipment</p> <p><u>Others</u></p> <p>– Traveling cost for DOF Thailand representatives relating to the project operation</p> <p><u>SEAFDEC/MFRDMD side</u></p> <p><u>Manpower</u></p> <p>– Marine biologists & Oceanographers (as required)</p>

PROJECT DESIGN MATRIX (Page 2)

DATE : 1 November 20
VERSION : PDM1

MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
1. Statistics in the State or District 2. Base line survey data	
1.1. Fisheries statistics 1.2. DOF surveillance records & police records 1.3. District DOF tribunal records. 2. Fisheries statistics 3.1. Base line survey data 3.2. District Administration's reports & project reports	- The coastal fishery resources management exercise is delegated to the local level. - No aggravation of the environmental pollution around Pulau Langkawi - No worsening of the environment by natural disasters - Tourists flow continues.
1. Project technical reports 2.1. Base line survey data 2.2. Fisheries statistics 3. Base line survey data 4.1. Fisheries statistics 4.2. Marine biological survey data 5.1. Fisheries statistics 5.2. DOF surveillance records, police records 5.3. District DOF tribunal records. 6.1. DOF Annual report & Project reports 6.2. DOF Annual Report & Project reports 6.3. Base line survey data	- Fishermen are cooperative to survey teams. - No aggravation of the environmental pollution around Pulau Langkawi - No worsening of the environment by natural disasters - Tourists flow continues. - The coastal fishery resources management exercise is delegated to the local level.
<p><INPUT> <u>DOF Malaysia side</u> <u>Contribution in kind</u> - Cost sharing : UDS 20,000</p> <p><u>Manpower</u> - MOF Malaysia staff in Langkawi - Marine biologists & Oceanographers from FRI - JICA Snr. Volunteer (Fish Processing - as required) - JICA Snr. Volunteer (Marine Culture - as required)</p> <p><u>Training</u> - Study tours and training courses</p> <p><u>Facilities, equipment and materials</u> - Project office space - construction & installation of FADs/ARs</p> <p><u>Others</u> - Local transportation - Miscellaneous local expenses</p>	<p><u>Pre-condition</u> - Fishers are encountering the menace of degradation of coastal fishery resources and eager to improve the situation</p>

Map of Pulau Langkawi



Malaysia Peninsular

Pulau Langkawi and location of 4 KENS