

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR CONSTRUCTION OF
A FISHERIES RESEARCH & TRAINING VESSEL
FOR THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
(SEAFDEC)

February, 2003

Japan International Cooperation Agency
Fisheries Engineering Co., Ltd.

PREFACE

In response to a request from the Southeast Asian Fisheries Development Center (SEAFDEC), the Government of Japan decided to conduct a basic design study on the Project for Construction of a Fisheries Research and Training Vessel for Southeast Asian Fisheries Development Center and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to SEAFDEC a study team from September 30 to October 24, 2002.

The team held discussions with the officials concerned of SEAFDEC, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to SEAFDEC in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between Japan and SEAFDEC.

I wish to express my sincere appreciation to the officials concerned of SEAFDEC for their close cooperation extended to the teams.

February, 2003



Takao Kawakami

President

Japan International Cooperation Agency

February, 2003

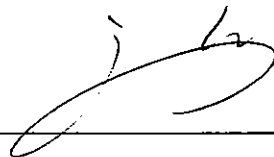
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Construction of a Fisheries Research and Training Vessel for Southeast Asian Fisheries Center.

This study was conducted by Fisheries Engineering Co., Ltd., under a contract to JICA, during the period from September, 2002 to February, 2003. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of SEAFDEC and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



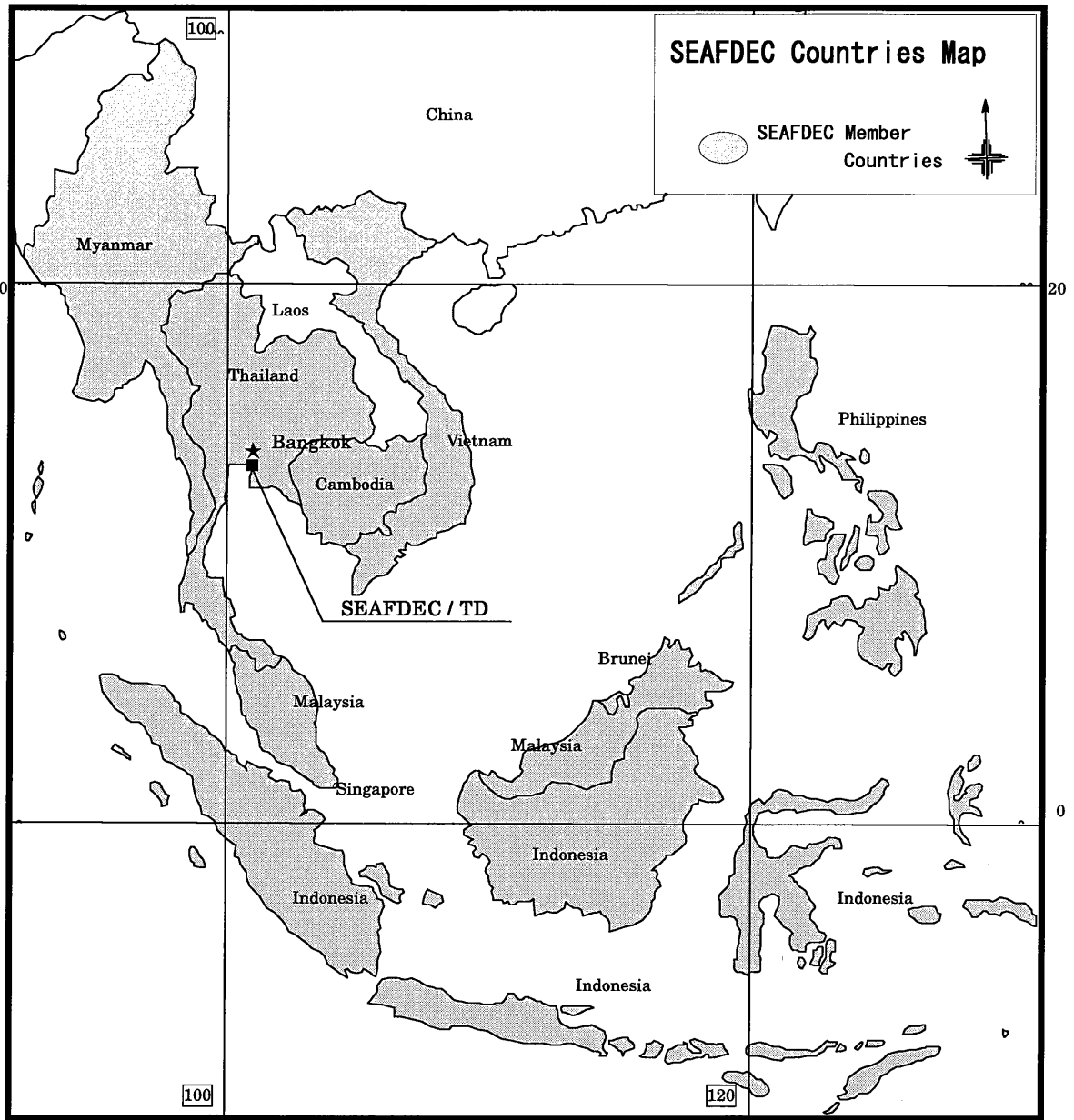
Kuniaki TAKAHASHI

Project manager,

Basic design study team on

the Project for Construction of a Fisheries
Research and Training Vessel

Fisheries Engineering Co., Ltd.





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Abbreviation

APT	Automatic Picture Transmission
AQD	Aquaculture Department
ASEAN	Association of South East Asian Nations
B	Breadth molded
BFAR	Bureau of Fisheries and Aquatic Resources
CRT	Cathode Ray Tube
CTD	Conductivity, Temperature and Depth Measuring Instrument
d	Draught
D	Depth molded
DO	Dissolved Oxygen
DSC	Digital Selective Calling
FCCRF	Fao Code of Conduct for Responsible Fisheries
FM	Frequency Modulation
FOT	Fuel Oil Tank
FRP	Fibreglass Reinforced Plastic
FWT	Fresh Water Tank
G/T	Gross Tonnage
GDP	Gross Domestic Products
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
HF	High Frequency
ICES	International Council for the Exploitation of the Sea
JICA	Japan International Cooperation Agency
JTED	Juvenile and Trash Excluder Devices
N	Newton (1 kgf = 9.80665 N)
KT	Knot ($v = 1,853\text{m/sec}$)
LCD	Liquid Crystal Display
LDC	Less Developing Countries
Loa	Length over all
MARPOL	International Convention for the Prevention of Pollution from Ships
MF	Medium Frequency
MFRD	Marine Fisheries Research Department
MFRDMD	Marine Fisheries Resources Development & Management Department
NAVTEX	Navigation Telex
NK	Nihon Kaiji Kyokai
NOAA	National Oceanic and Atmospheric Administration
NO _x	Nitrogen Oxides
PAR	Photosynthetically Active Radiation
PMP	Preventive Maintenance Policy
SEAFDEC	Southeast Asia Fisheries Development Center
SOLAS	Safety of Life at Sea
SSB	Single Sided Band
TD	Training Department
TED	Turtle Excluded Device
TS	Target Strength
VHF	Very High Frequency
WR	Watchkeeping Receiver
XCTD	Expendable CTD

SUMMARY

The population of the SEAFDEC member countries eligible for Japanese grant-aid totals 426.9 million – 12.2 million in Cambodia, 210.5 million in Indonesia, 48.1 million in Myanmar, 78.4 million in the Philippines, and 77.7 million in Vietnam. The fishing population comprises 3.4 % of total population in Cambodia, 4.2 % in Myanmar, and 3.2 % in Vietnam, and these ratios are all well above the ASEAN average of 2.3%, making the fishing industry a major source of employment in these countries. The share of agriculture and fishing industries in total GDP is 41.4 % in Cambodia, 19.4 % in Indonesia, 59.5 % in Myanmar, 17.6 % in the Philippines, and 25.4 % in Vietnam, with this sector particularly important in Cambodia, Myanmar, and Vietnam. The importance of fish products in the overall diet is particularly high throughout the ASEAN region, with fish comprising, on the average, an extremely high share (45 %) of total animal protein intake.

The total ASEAN fish catch rose 39% from 10.9 million tons in 1990 to 15.1 million tons in 1999. However, as per capita fish demand has also been increasing rapidly at an average annual rate of 12 %, according to the SEAFDEC's Outlook of fish supply and demand in the ASEAN region, it is feared that fish supply will be unable to keep up with rapidly increasing demand.

In order to maintain a stable supply of fish and marine products in the ASEAN region while also maintaining sustainable fisheries, it is vital that efforts be directed to sustainable resource utilization and environmental protection. To this end, there is a pressing need, based on the Code of Conduct for Responsible Fisheries, to restrain fishing and aquaculture activity within constraints that permit sustainable resource utilization, while curtailing excessive catch effort; and to strengthen fishery and resource management, as, for example, by halting any fishing or aquaculture operations that would have an adverse impact on the marine environment.

In November, 2001, SEAFDEC held a special "ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium", at which the Ministerial delegates from the member countries, "recognizing the importance of sustainable fisheries for food security and the livelihoods and well-being of the ASEAN people", resolved to formulate regional guidelines to implement the Code of Conduct for Responsible Fisheries in the ASEAN region; nurture the human resources to attain the goal of a responsible fishery; and initiate a program of technical cooperation and effective fishery management within the ASEAN community.

Based on this resolution, delegates from fishery agencies throughout the region adopted an action plan, which incorporates investigating on the potential of fisheries resources, and establishment and implementation of comprehensive policies for innovative fisheries management in the region.

Among the SEAFDEC member countries, Cambodia, Indonesia, Myanmar, the Philippines, and Vietnam are shortage of their own research and training vessels and so are in no position to mount

independent training operations directed at proper utilization of marine resources, such as monitoring stock conditions and preventing incidental catches and post-harvest losses – which are indispensable elements in fishery and resource management programs. Accordingly, SEAFDEC, as the regional treaty organization charged with the task of fisheries development in Southeast Asian waters, has been directed to implement, in cooperation with its member countries, a program of coastal fishery surveys and training activities. However, among the fleet research and training vessels attached to its Training Department, the hulls of two vessels (MV. PLATOO and MV. PLALUNG) are severely worn, while their equipment is superannuated, and this presents major obstacles to the implementation of fishery surveys and onboard training programs in coastal waters. As a result, these vessels are unable to upgrade their stock surveys and technical training programs geared to proper utilization of marine resources in the coastal waters of Cambodia, Indonesia, Myanmar, the Philippines, and Vietnam.

Implementation of marine resource studies over the broad expanse of ASEAN waters will enable SEAFDEC to obtain a good understanding of usable marine stocks in the above five countries and to formulate a Fishery Research and Training Plan to strengthen technical training of local fishers in the proper utilization of marine resources. Accordingly, in June, 2002, SEAFDEC requested grant-aid cooperation from the Government of Japan for a “Project for Construction of a Fisheries Research and Training Vessel”, calling for the construction of a Fishery Research and Training Vessel capable of conducting fishery surveys and training operations in coastal waters, along with procurement of the requisite fishing gear, fishing machinery, and survey equipment.

In response to this Request, the Government of Japan decided to conduct a basic design study, for which the Japan International Cooperation Agency (JICA) dispatched the following Survey Teams:

Basic Design Study:	from September 30 to October 24, 2002
Consultation on the draft report:	from December 15 to December 24, 2002

On the basis of a field survey and analysis in Japan, such subjects as the background and contents of the Plan, natural environment, operation and maintenance system, and the construction and procurement plan were studied, resulting in the following Plan for project scale and contents, as the most appropriate to Japanese grant-aid.

a. One Fisheries Research & Training Vessel

	Item	Q'ty	Specifications
1.	Navigation area		International: ASEAN EEZ waters
2.	Flag, Classification and Rules to apply		
	Flag:		The Kingdom of Thailand
	Classification:		Nippon Kaiji Kyokai (NK) NS* MNS*

	Rules to apply:	Maritime Rules of Thailand, Rules of Classification Society, International Convention for Safety of Life at Sea, 1974 (limited application), International Convention on Tonnage Measurement of Ships, International Convention for Load Lines, International Conference for Preventing Collision at Sea, International Convention for Preventing Pollution from Ships, Maritime Rules of Japan for interpretative and supplementary purpose	
3.	Principal particulars		
	Length overall	32.50 m	
	Breadth, molded	7.20 m	
	Depth, molded	3.00 m	
	Gross tonnage	208 tons, international	
	Main engine	736 kW x 1 set	
	Service Speed	About 12.0 knot, when loaded to designed draft	
	Capacity	Fish hold	20 m ³
		Fuel oil tank	55 m ³
		Fresh water tank	13 m ³
	Complement:	Total onboard	37 persons (Crew 15, Instructor/scientist 4, Trainee 18)
10.	Fishing gears		
	Trawl fishing		
	Split trawl winch	2	Hydraulic, 35kNx50m/minx20mmD SWRx 1,500m
	Trawl net drum	1	Hydraulic motor drive, 30 kN x 30 m/min x 4.5 m ³
	Cod winch	2	30 kN x 25 m/min x 16mmD SWR x 30m
	Slipway door	1	Hydraulic operated, at aft end of working deck
	Longline fishing		
	Line hauler	1	Hydraulic driven
	Line caster	1	Hydraulic driven
	Branch line reel	1	Hydraulic driven
	Buoy line winch	1	Hydraulic driven
	Line spool	2	With cassette spools 20 x @2.5 km monofilament
	Deep sea pot fishing		
	Capstan	1	20 kN x 15 m/min
	Drift gillnet fishing		
	Net hauler	1	Hydraulic
	Net transfer roller	1	Hydraulic
	Fishing electronic equipment		
	Trawl monitoring system	1	
	Fish finder	1	3 wave (200 kHz, 110 kHz and 50 kHz)
	Scanning sonar	1	360 degree, about 4000 m range, color 21 inch LCD
12.	Fisheries research facility		
	Scientific echo sounder	1	38 kHz and 120 kHz
	Current observation unit	1	Doppler, 11 layers
	NOAA Information Receiver	1	With display (14") unit
	Seabed mapping sonar	1	Transducer fixed at ship bottom, 3D seabed map
	Ship Data Server	1	Ship data acquisition system
	Fluorometer	1	Direct sampling from seawater supply system
	CTD winch	1	Hydraulic drive (working sea depth of max 500 m)
	Oceanographic winch	1	Hydraulic drive (working sea depth of max 500 m)

b. Equipment & material

1.	Fisheries research equipment		
	CTD system	1	CTD, 1.7 lit x 12 rosette sampler, DO, pH, PAR and fluorescence sensor
	Digital XCTD	1	Hand launcher, XCTD probe x 12 units
	Plankton / larva net	1	Bongo net
	Water sampler	10	Niskin water sampler
	Reversing thermometers	10	Protected
		10	Unprotected
	Reflectance Radiometer	1	Portable type for underwater use
	Core sampler	1	89mm x 1m
	Bottom sampler	1	Ekman-Berge, 20 x 20 cm
	Temp and depth recorder	4	500m
	Auto Analyzer	1	Analyzing nitrite, nitrate, phosphate, silicate
	Thermosalinograph	1	En-route sampling together with fluorescence
	Laboratory equipment and utensils	1	Biological microscope, balance, refrigerator, sterility test unit, sieve shaker, glass utensils
2.	Fishing gears		
	Bottom trawl gears	1	Trawl net, otter boards and gears
	Pelagic trawl gears	1	Trawl net, bi-blade aluminum otter boards and gears
	Underwater TV	1	Recording pre-set type, sea depth 100m
	Pelagic longlines and gears	1	50 km x 3.2 mmD monofilament, 1,000 branches
	Toripole streamer	1	A set of Toripole and streamer
	GPS Buoy	4	with self-calling radio equipment
	Bottom longlines and gears	1	6 mmD x 6.25 km, 2,000 hooks
	Deep sea pot gears	1	22 mmD x 3.0 km polypropylene main line
	Shrimp pot,	100	
	Crab pot	100	
	Drift gillnet and gears	1	100 mm mesh x 3,000 mL x 8 mH
	Jigging machine	4	Electrolnically controlled automatic machine
	Fishing lights	6	
	Gears	1	Lines, lures, 18 mD parachute anchor
3.	Spare parts	1	Engine spare parts and media of records.

To implement the subject Plan on the basis of grant-aid from the Government of Japan, a construction period of 12.5 months will be required, including the detail design. With respect to project cost allocation, as construction of the Plan vessel and procurement of related equipment and materials will all be undertaken in Japan, the SEAFDEC side will incur no cost obligation, with the Japan side covering the entire project budget. In addition, it has been determined that annual operating and maintenance costs will be within the range of the surpluses generated by the SEAFDEC Training Department between 1998 ~ 2000 and so should impose no major burden on the SEAFDEC organization.

With respect to the operation, SEAFDEC will organize a committee so called the “Japanese Grant Aid Eligible Countries Committee”, comprising member countries eligible for Japanese Grant Aid – viz., Cambodia, Indonesia, Myanmar, the Philippines, and Vietnam. This Committee will prepare a mid-term training and research plan for the Plan vessel in consultation with the Japanese Government to ensure that the primary benefit of the Plan vessel will be given to the member

countries of the Committee based on their needs and submit the mid-term training and research plan to SEAFDEC Council for its endorsement.

Based on this mid-term plan, an annual operating plan will be drawn up for the Plan vessel by a committee called the “Operation Committee”, to be established at the SEAFDEC Training Department. This Department has an adequate pool of officers and ratings who satisfy the necessary qualification requirements for crews on board the Plan vessel, so that no operating problems should arise. Moreover, the personnel that will be responsible for fishery surveys and at-sea training all possess a high level of technical competence, indicating that there will be no problems in connection with either the training or survey phases of the project.

Plan implementation can be expected to produce the following benefits in terms of solving the fishery and resource management problems that SEAFDEC is currently facing in Cambodia, Indonesia, Myanmar, the Philippines, and Vietnam.

- a) An increase in the number of research days dedicated to stock surveys in the coastal waters of the five target countries.

Survey programs can be conducted in the five target countries to acquire information on the coastal fish stocks, thereby promoting proper resource utilization. It will be possible to conduct 100 days per year of stock surveys in the target waters that have hitherto not been undertaken due to superannuation of the two existing research and training vessels attached to SEAFDEC.

- b) An increase in the number of on board training days per year, oriented to responsible fisheries and targeted at fishers in Cambodia, Indonesia, Myanmar, the Philippines, and Vietnam.

Owing to superannuation of the existing SEAFDEC research and training vessels, onboard training days dedicated to responsible fisheries during 2001 declined to only 12 days. However, with the Plan vessel, the level can be expected to reach 50 days per year.

Along with the above benefits, the overall Plan will facilitate the development of suitable stock management policies, based on a deeper understanding of stocks in the coastal waters of the five target countries, and will also make it possible for coastal fishermen to work in sustainable fisheries. In addition, based on the ability to properly utilize coastal fishery resources, these fishermen can be expected to enjoy increased fishery-related incomes. These benefits would accrue to all of the 10.9 million fishermen living in the target countries (Cambodia, Indonesia, Myanmar, the Philippines, and Vietnam). It is, therefore, appropriate and justified that this project be implemented on the basis of grant-aid cooperation.

Following construction of the Plan vessel, for making full use of the Research and Training Vessel

and its equipment, and in order to strengthen the programs for resource surveys in the coastal waters and technical training oriented to responsible fisheries in the target countries, it is recommend that careful consideration be given to the following points.

1. Funding for the SEAFDEC Training Department

SEAFDEC appropriations from its member countries have been declining. To cope with the financial problems that have arisen from declining revenues, SEAFDEC has been obliged to consider introducing a system of cost-sharing, whereby beneficiary countries would defray a portion of the costs of the particular projects yielding these benefits. Under this system, in the case of the subject Plan as well, the beneficiary countries would be called on to share a portion of vessel operating expenses. However, since, by the very objectives of the project, the beneficiary countries are limited to developing nations, we believe that the shared costs would presumably be confined to local expenses, such as the provision of food, water, and labor associated with survey and on board training activities.

Operating and maintenance costs for the Plan vessel during its initial operating year are projected at about 7.6% of average annual revenues and 12.3% of the average annual surplus at the SEAFDEC Training Department over the 1998 to 2000 period, while after 8 years of service, they will rise to about 12.2% of annual revenues and consume almost the entire annual surplus recorded during those years.

If average annual revenues at this Department were to decline some 12% from 1998-2000 levels, there is a possibility that, after 8 years of service, the Department would be hard pressed to cover maintenance costs for the Plan vessel. Accordingly both the SEAFDEC Secretariat and its Training Department will be required to make stringent efforts to maintain Training Department revenues at recent levels and curtails expenditures.

2. Connection with Other Donor Programs

The coastal stock survey and training programs, oriented to proper utilization of marine resources, that are to be conducted by the Plan vessel will be implemented jointly by SEAFDEC and the beneficiary countries. However, were these survey and training programs to be linked to cooperative and funding projects in the beneficiary countries from other donors, universities, and scientific research organizations, even better results could be obtained from Plan implementation. Furthermore, based on such linkage to other donor programs, the cost-sharing burden for beneficiary countries could also be alleviated. When drafting the research and training programs, therefore, it is hoped that SEAFDEC and the various beneficiary nations will actively pursue cooperative relationships with donors, universities, and research organizations with a view toward tying in these programs with Plan vessel operations.