STUDY REPORT
ON
THE PROJECT FOR CHILD HEALTH
IN
THE REPUBLIC OF THE PHILIPPINES

MARCH 1998

JAPAN INTERNATIONAL COOPERATION AGENCY

STUDY REPORT
ON
THE PROJECT FOR CHILD HEALTH
IN
THE REPUBLIC OF THE PHILIPPINES

MARCH 1998

JAPAN INTERNATIONAL COOPERATION AGENCY

PREFACE

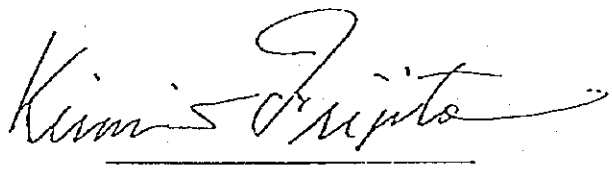
In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct a basic design study on the Project for Child Health and entrusted the Japan International Cooperation Agency (JICA) to conduct the study with the assistance of the Japan International Cooperation System (JICS).

JICA sent to Philippines a study team from December 14 to December 23, 1997.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation extended to the team.

March 1998

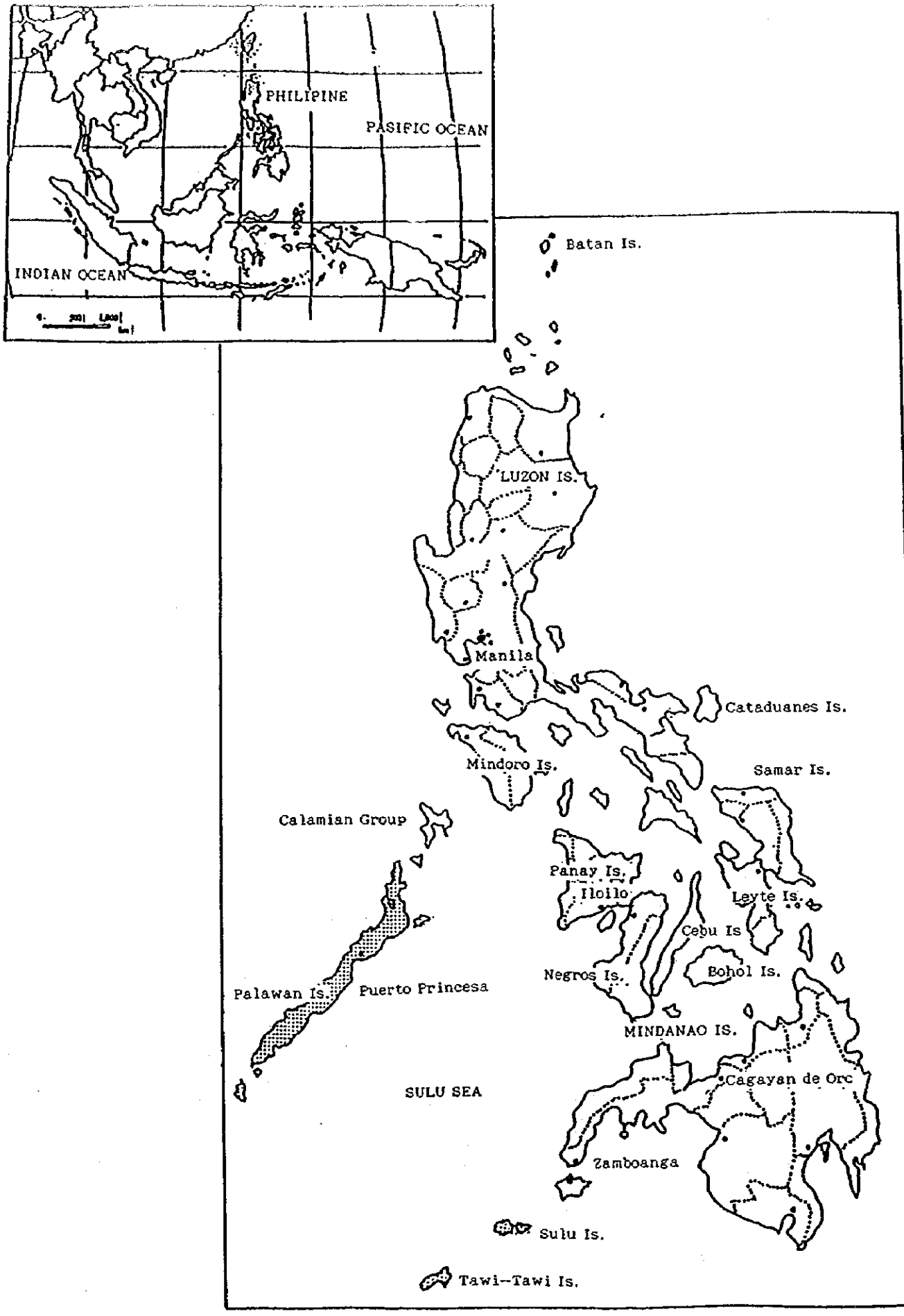


Kimio Fujita
President
Japan International Cooperation Agency

Table of Contents

Abbreviations

B H W	: Balangai Health Worker *Balangai* means most small administration unit that population is 2000 over.
D O H	: Department of Health
E / N	: Exchange of Note
M C S	: Malaria Control Service *MCS* is one division of DOH in Philippine Government
R H U	: Rural Health Unit
UNICEF	: United Nations Children's Fund
W H O	: World Health Organization


PHILIPINE
PASIFIC OCEAN
INDIAN OCEAN
Batan Is.
LUZON IS.
Manila
Cataduanes Is.
Mindoro Is.
Samar Is.
Calamian Group
Panay Is.
Iloilo
Leyte Is.
Cebu Is
Negros Is.
Bohol Is.
Palawan Is.
Puerto Princesa
MINDANAO IS.
SULU SEA
Cagayan de Orc
Zamboanga
Sulu Is.
Tawi-Tawi Is.

Chapter 1 Background of the Project

Malaria, which previously raged throughout all of the Philippines, was brought under control following World War II as a result of assistance provided by the United States, and the number of patients and motatity caused by the disease had both fallen greatly by the onset of the 1970's. Indeed, the number of patients at that time was less than it is now (1996). However, as a result of the freezing of overseas assistance and stagnation of the Philippine economy in the wake of the oil shocks, etc., prohibition of the use of DDT due to environmental concerns, proliferation of malaria-carrying mosquitoes and protozoa resistant to insecticides and drugs, and a number of other factors, it became more difficult to execute effective countermeasures against malaria. As a result, even though it once appeared as though the Philippines was well on the way to eradicating malaria, the number of patients suffering from the disease increased rapidly and once again broke through the 100,000 barrier in the 1980s. In response to this situation, the strategy regarding malaria was revised from one of eradication to containment and a reform of malaria countermeasures was effected. This, combined with a subsequent recovery in economic conditions, has led to a fall in the number of malaria patients to between 30,000 and 40,000 (according to 1996 statistics).

In view of the said situation, malaria countermeasures have retained their status as a national project even following decentralization in the country. The Department of Health of the Philippines, having made the eradication of malaria by 2020 a target, has obtained cooperation from WHO and other international agencies in distributing mosquito nets, identifying and eradicating sources of infection, and carrying out prompt diagnoses and appropriate treatment aimed at preventing serious injury or death caused by delays in proper care. Furthermore, the Department of Health has placed great emphasis on activities for the development of personnel who are involved in malaria control from the central government level right down to the village level.

As a result of these malaria countermeasures, the number of areas where malaria is still a problem has been steadily reduced and outbreaks of the disease have almost disappeared in the provinces of Leyte, Samar, Cebu and Bohol, etc. in the Visayan Islands. In many areas in Luzon and Visayan, malaria has almost ceased to be a problem at all in terms of public hygiene.

However, in south-western provinces (Palawan, Mindanao, Sulu and Tawi-Tawi) and parts of northern Luzon, malaria remains a major cause of illness and

mortality and is a particularly high contributor to infant mortality (due to the low resistance of children). Since these regions are remote areas where economic development has been slow to advance, the distribution of mosquito nets, drugs and anti-malarial drugs, etc. to inhabitants has not been carried out on a level comparable with that seen in other regions. This why it has not been possible to reduce the incidence of malaria throughout all the Philippines. As can be seen in Table 1, the number of malaria patients in recent years has been greatest in Palawan, followed in order by Davao Oriental and Davao Norte on Mindanao Island, Tawi-Tawi and Sulu. The provinces in most need of malaria countermeasures are Palawan, which is the highest ranking province, and Tawi-Tawi and Sulu, which are regarded as conspicuously contaminated areas due to a high ratio of patients per unit area and unit population.

Table 1-1 Twenty Provinces with the Highest Number of Confirmed Malaria Patients (1991-1995)

(Unit: patients)

	Provinces	1995	1994	1993	1992	1991	5-Year Average
1	Palawan	8,193	8,385	6,960	8,263	8,782	8,117
2	Davao Oriental	3,097	5,082	3,615	11,623	3,560	5,395
3	Davao del Norte	3,683	3,863	8,206	7,115	3,639	5,301
4	Tawi-Tawi	2,750	3,285	4,103	6,307	6,544	4,598
5	Sulu	5,439	4,321	2,449	2,720	4,646	3,915
6	Agusan del Sur	2,519	2,587	3,322	6,812	3,807	3,639
7	Minodoro Occidental	2,051	2,874	2,909	3,581	6,782	3,639
8	Kalinga	3,878	2,043	1,660	3,435	4,818	3,167
9	Apayao						
10	Agusan del Nort	2,768	1,873	3,169	3,779	2,859	2,890
11	Issbela	2,053	2,139	1,978	3,804	4,160	2,827
12	Cagayan	3,122	1,921	1,808	2,002	3,049	1,866
13	Quezon	679	903	2,113	2,588	3,049	1,866
14	Ifugao	1,246	1,399	1,037	1,823	2,599	1,621
15	Zamboanga del Sur	657	1,532	1,426	1,112	2,054	1,356
16	Davao del Sur	1,371	1,168	949	1,810	1,451	1,350
17	Bulddnon	484	784	1,196	2,514	1,156	1,227
18	Misanis Oriental	1,456	1,417	756	643	288	912
19	Ouirino	859	529	847	1,137	975	869
20	Mr. Province	1,183	995	410	743	555	778
	Total	47,488	47,103	48,913	71,811	64,491	55,961
	National Total	59,015	57,493	64,779	98,515	86,392	73,239
	% National Total	80,47%	81,93%	75.51%	72,89%	74.65%	76.41%

(Source: 1996 MCS Annual Report)

Table 1-2 shows the three provinces that had the highest malaria morbidity and mortality rates in 1996.

Table 1-2 Malaria Morbidity and Mortality Rates in Palawan, Sulu and Tawi-Tawi

	Mobidity Rate (1996) (Per 100,000)	Mortality Rate (1996) (Per 100,000)
Palawan	911	15.49
Sulu	666	1.60
Tawi-Tawi	1,457	0.41

(Source: 1996 MCS Annual Report)

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The Department of Health, in the three provinces where malaria is the most prevalent (Palawan, Sulu and Tawi-Tawi), aims to reduce the malaria morbidity rate and mortality rate among inhabitants (especially infants) in contaminated areas by 20% and 10% per year respectively, and to prevent the reoccurrence of the disease in areas that have already been made malaria-free. The objective of the Project is to support the achievement of these targets through supplying equipment that is essential for malaria control activities.

2-2 Basic Concept of the Project

The Project involves the supply of equipment and drugs, etc. that are necessary in order to reduce the incidence of malaria in the three provinces of Palawan, Sulu and Tawi-Tawi, where the disease is prevalent.

Equipment that is required for the implementation of malaria control has been divided according to the following four purposes.

a) Prevention of malaria infection using mosquito nets coated with insecticide:

Mosquito nets and insecticide for coating

b) Prompt diagnoses and appropriate treatment on the village level:

Microscopes, anti-malarial drugs, health worker's kits (BHW kits)

c) Assessment of the malaria prevalence rate and state of control (surveillance and monitoring):

Personal computers, surveillance systems

d) Transportation equipment:

Vehicles, motor cycles, outboard engines

The above selection of equipment has been planned based on the activities of malaria control programs being implemented by the Department of Health (DOH), and consideration of the fact that the Malaria Control Services ; MCS (one of section in the DOH) is manned by staff who have received training for the execution of such

countermeasures. Also, activities on the village level for the prevention of infection and provision of prompt diagnoses and appropriate treatment, are carried out by malaria control officers and health volunteers in cities, towns and villages located in high risk area. Moreover, inhabitants in these areas participate actively in these malaria control programs. In view of this situation, equipment that is necessary for the promotion of sustained malaria control involving the participation of inhabitants shall be planned (BHW kits, etc.).

2-3 Basic Design

2-3-1 Basic Concept of the Project

The basic concept regarding the main items of equipment to be supplied under the Project is described in the following sections.

a) Mosquito Nets, Insecticides and Drugs

Of all the households that are located in the three target provinces of high malaria prevalence, it is estimated that around 20% have either received distribution or have purchased their own mosquito nets. The Project, with respect to the remaining 80% of households, shall in principle distribute one mosquito net to each household free of charge. Table 2-1 shows the number of mosquito nets to be distributed in this way in each target province.

Table 2-1 Number of Mosquito Nets to be Distributed

	Population in Malaria Prevalent Areas	Households in Malaria Prevalent Areas	Households Without Mosquito Nets (80% of Total)	Number of Mosquito Nets to be Distributed
Palawan	535,000	89,167	71,333	71,000
Sulu	565,383	94,231	75,384	75,000
Tawi-Tawi	259,825	43,304	34,643	34,000
Total	1,360,208	226,701	181,361	180,000

It is planned for the distribution of mosquito nets to be completed within six months of their delivery to each province. When distributing the mosquito nets,

sustained malaria control programs shall be implemented based on the education and participation of inhabitants.

With regard to insecticide, which needs to be coated on mosquito nets twice per year, deltamethorin shall be used because this is already commonly adopted for malaria control in the Philippines and can easily be handled and because it is recommended by WHO. A two-year supply of deltamethorin (for four coatings) shall be supplied under the Project.

With regard to anti-malarial drugs required for treatment and expendable items, etc. required for monitoring, a three-year supply of each with respect to the target population shall be provided.

b) Anti-malarial Drugs

Concerning anti-malarial drugs to be used for the treatment of infected patients, these shall be used in a planned fashion by, for example, administering them based on estimation of the spread of resistant strains of malaria, and so on. Chloroquine shall be considered as the first choice anti-malarial drug and, in areas where the spread of malaria that is resistant to chloroquine has been reported, a combined drug made from sulfadoxine and pyrimethamine (trade name, Fancidal) shall be administered as the second choice drug. In cases where administration of the said drugs does not appear to be having an effect, quinine, which is used to combat more resistant strains of malaria, shall be administered. Also, primasquine, which is effective in preventing reoccurrence of tertian malaria, which lies dormant in the liver, and preventing infection of Anopheles mosquitoes through killing the breeding organisms of tropical malaria protozoa, shall be included in the supply plan.

c) BHW Kits

Through providing Balangai Health Worker (BHW) kits containing various drugs and diagnostic equipment for carrying out effective treatment on the village level, and combining the use of such kits with anti-malarial drugs, a large effect can be anticipated on the village level in terms of rapid diagnoses and appropriate treatment.

d) Surveillance System

A surveillance system, composed of elements of GPS/GIS, the culture system and the ELISA system, shall be established in the MCS. The system shall be introduced in order to allow the MCS to evaluate the effectiveness of Project implementation, understand conditions of malaria prevalence, monitor sudden outbreaks of malaria and carry out accurate diagnosis and treatment, etc. based on epidemiological and local points of view.

The following table shows the purposes of use and objectives of each system component.

Item	Purpose of Use	Objective
GPS/GIS	• GPS: Preparation of digital maps of target areas for use in malaria control • GIS: Establishing the relationship between the above maps necessary for malaria control and data bases relating to malaria occurrence, to enable visible analysis	• Accurate understanding of the distribution of patients and the distribution of sources of malaria-carrying mosquitoes within target areas • Formulation of countermeasures based on reliable information
ELISA system	• Measurement of anti-malarial protozoan antibodies • Fast and large-scale processing of specimens	• Time series understanding of local malaria epidemics (since antibodies remain following infection, it is possible to understand conditions of past prevalence)
Culture system	• Laboratory culture of malaria protozoa	• Stable supply of antigens (malaria protozoa) for use in the ELISA system

In the MCS, GPS/GIS shall be used to set overall target areas and model districts, and separate surveillance activities shall be conducted in each (two types). The following table shows the main contents of work and the anticipated effects.

	Overall Target Areas	Model Districts
Work	• Obtain digital maps from the National Geographical Institute of the Philippines and prepare basic GIS maps. • Incorporate information on conditions of malaria prevalence and mosquito net distribution, etc. in the target areas into the basic maps, to build data bases and conduct analysis.	• Select four or five model villages from each target province. • Using GPS, prepare digital maps (houses, outbreak sources, roads, medical care facilities, etc.) for each target village. • Using GIS, input data relating to malaria prevalence conditions (numbers of patients, distribution of mosquito nets, distribution of anti-malarial drugs, provision of BHW kits, etc.) onto the digital maps, to prepare and analyze basic maps.
Effect	• It is possible to visibly understand conditions of malaria prevalence (identification between areas of high malaria prevalence and low prevalence is simple). • An appropriate response to malaria prevalence is possible (rapid strategy formulation). • It is possible to visibly understand countermeasure work conditions (effective and economic planning and operation).	• It is possible to visibly understand conditions of malaria prevalence (identification between areas of high malaria prevalence and low prevalence is simple). • It is possible to accurately monitor conditions of malaria prevalence. • It is possible to formulate appropriate strategies for fighting malaria infection (concentrated countermeasures in high prevalence areas).

The MCS has until now carried out the above-mentioned surveillance activities through manual work. However, through using GPS/GIS, which has become more widespread in recent years, it is possible to improve the speed and efficiency of this work. This system was formulated in 1992 by a working committee of WHO and is considered to be effective in the fight against not only malaria but other diseases. It has already been implemented in Thailand, Sri Lanka, countries in Africa and countries in Latin America, and is used in the formulation and evaluation of control strategies. Introduction of this system to the Project areas will make it possible to efficiently prepare maps, input data and conduct analysis, and it is anticipated that this will contribute to the improved efficiency and cost reduction of malaria countermeasures overall.

Furthermore, since the MCS contains staff who have received training with respect to the operation of such a system, there should be no problems in terms of operation and management.

e) Vehicles

With respect to vehicles, the request has asked for the supply of two vehicles to Palawan and one vehicle each to Sulu and Tawi-Tawi. Of the total population of

535,000 living in the malaria prevalent area of Palawan, approximately 438,000, or 82%, live on Palawan Island (the largest island in the Philippines, measuring 450 km from north to south). For this reason, based around the provincial capital of Puerto Princesa where the local MCS office has been established, malaria control activities are being carried out simultaneously in the northern districts (within approximately 250 km of the provincial capital and possessing a population of approximately 160,000) and the southern districts (approximately 200 km and 280,000). The Malaria Control Service of the Palawan Provincial Health Office possesses one vehicle (total mileage, approximately 200,000 km), however, since this is not a four-wheel-drive vehicle, it cannot be used in remote districts where road conditions are poor, and its range of use is limited solely to the urban areas of Puerto Princesa. Therefore, under the Project, two new vehicles shall be supplied in order to aid the distribution of large quantities of mosquito nets and the execution of subsequent inhabitant education and surveillance activities, etc., and to cover the northern and southern districts located on either side of Puerto Princesa.

In the cases of Sulu and Tawi-Tawi, since the Malaria Control Service of each Provincial Health Office does not possess a vehicle, this is hindering mosquito net distribution, inhabitant education and surveillance activities on these islands. Accordingly, one vehicle each shall be supplied to these provinces under the Project.

Province	Requested Quantity	Project Quantity
Palawan	2	2
Sulu	1	1
Tawi-Tawi	1	1

f) Motor Cycles

Motor cycles have been requested with the aim of promoting malaria diagnosis and treatment, inhabitant education and monitoring activities, etc. by rural health units (RHU) in each town.

In Palawan, since road transportation is possible in almost all the districts where RHU exist; not including the RHU which already possess motor cycles, one motor cycle each shall be provided to four RHU (four motor cycles in all) which

currently have to carry out activities on foot.

In Sulu and Tawi-Tawi, since none of the RHU in these provinces possess motor cycles, malaria activities are limited in range and time because staff of the Malaria Control Service must visit each village on foot. Therefore, with consideration also given to the geographical characteristics (potential for road transport) surrounding the RHU in each province, motor cycles shall be provided to 10 of the 18 RHU in Sulu (10 motor cycles), and to five of the 10 RHU in Tawi-Tawi (five motor cycles).

Province	Number of RHU	Requested Quantity	Project Quantity
Palawan	22	20	4
Sulu	18	10	10
Tawi-Tawi	10	5	5

g) Outboard Engines

Since each of the target provinces is composed of numerous islands, sea routes are used to travel between the main islands where the provincial capitals are located and the surrounding islands. Therefore, it is necessary for staff of the Provincial Health Office Malaria Control Services to travel frequently to and from districts and villages in order to distribute large quantities of mosquito nets and carry out subsequent inhabitant education and surveillance activities, etc. Since boats are frequently used for such traveling, a request was made for the supply of boats. However, because the boats requested by the Philippine side would need to be hand-made according to order, thus making it difficult to prepare specifications, they would not be suited to supply based on the open tender system. For this reason, it has been decided to only supply outboard engines for the boats that are currently owned by each province's Malaria Control Service. However, since it is technically impossible to install an outboard engine on the boat possessed by the Palawan Malaria Control Service, outboard engines (one engine each) shall only be supplied to Sulu and Tawi-Tawi.

Province	Requested Quantity (Boats)	Project Quantity (Outboard Engines)
Palawan	1	0
Sulu	1	1
Tawi-Tawi	1	1

2-3-2 Basic Design

Table 2-2 (Contents and Purpose of Use of Main Equipment) shows the contents and quantities of mosquito nets and equipment to be supplied under the Project. Moreover, Table 2-3 (Distribution Plan of Mosquito Nets and Equipment) shows the plan for distribution of the supplied items.

Table 2-2 Contents and Purpose of Use of Main Equipment

No.	Equipment	Purpose of Use	Quantity
1	Mosquito net (*1)	Protection from malaria-carrying mosquitoes	180,000
2	Vehicle	Transportation of mosquito nets and drugs, etc., and monitoring	4
3	Motor cycle	Transportation of mosquito nets and drugs, etc., and monitoring	19
4	Binocular biological microscope	Malaria investigation	58
5	Stereo zoom microscope	Malaria investigation	6
6	Multi-viewing microscope	Malaria investigation training	2
7	Outboard engine	Transportation of mosquito nets and drugs, etc., and monitoring	2
8	Insecticide (deltamethorin)	Coating of mosquito nets	8,600 liters
9	Anti-malarial chloroquine (100 tabs/bottle)	Malaria treatment	52,500 bottles
10	Anti-malarial sulfadoxine + pyrimethamine (100 tabs/bottle)	Malaria treatment	3,000 bottles
11	Anti-malarial quinine (100 tabs/bottle)	Malaria treatment	7,875 bottles
12	Anti-malarial primasquine (100 tabs/bottle)	Malaria treatment	36,750 bottles
13	Personal computer system	Processing of data on malaria	7 sets
14	BHW kit (*2)	Diagnosis and treatment gear for village health workers	7,100 sets
15	Slide glasses (100/box)	Malaria investigation (blood smear sample preparation)	5,250 boxes
16	Gimsa stain solution	Malaria investigation (staining of blood samples)	500 liters
17	Blood lancet (200/box)	Malaria investigation (blood sample collection)	2,625 boxes
18	Surveillance system (*3)	Study of malaria prevalence conditions	1 set

*1: Mosquito net specifications are as follows:

Dimensions	Approx. 190 (W) x 180 (L) x 150 (H)
Material	Polyester
Fiber thickness	100 denier
Mesh size	156 openings/square-inch

*2: The contents of BHW (Balangai Health Worker) kits are as follows:

No.	Item	Specifications	Quantity
1	Shoulder bag	Cloth, water-proofed	1
2	Chloroquine	100 tabs/bottle/bottle (anti-malarial drug)	1
3	Primasquine	100 tabs/bottle/bottle (anti-malarial drug)	1
4	Paracetamol	100 tabs/bottle/bottle (fever relief drug)	1
5	Thermometer	Glass, alcohol type	1
6	Blood lancet (blood collection needle)	200/case, sterilized	1
7	Slide glass	72/box	1
8	Slide storage box	Capacity for 25-30 slides, plastic	1
9	Absorbent cotton and alcohol	50 g (cotton), 100 ml (alcohol), metal case	1

*3: The contents of the surveillance system are as follows:

No.	Item	Specifications	Quantity	Purpose of use
1	GPS/GIS system	2 GPS, 2 GIS (map data base preparation software), 2 lap top computers	1 set	Preparation of malaria prevalence map data
2	Culture system	CO2 incubator, clean bench, medical freezer, autoclave, etc.	1 set	Stable supply of antigens (malaria protozoa) for investigation of malaria antibodies
3	ELISA system	Micro plate reader, micro pipettes, magnetic stirrer, electronic scales, etc.	1 set	Investigation of malaria antibodies in bloodstream

Table 2-3 Distribution Plan of Mosquito Nets and Equipment

No.	Equipment	Palawan	Sulu	Tawi-Tawi	MCS	Total
1	Mosquito net	71,000	75,000	34,000		180,000
2	Vehicle	2	1	1		4
3	Motor cycle	4	10	5		19
4	Binocular biological microscope	25	21	12		58
5	Stereo zoom microscope	2	2	2		6
6	Multi-viewing microscope	1			1	2
7	Outboard engine		1	1		2
8	Insecticide (deltamethorin)	3,400	3,600	1,600		8,600 liters
9	Anti-malarial chloroquine (100 tabs/bottle)	21,000	21,000	10,500		52,500 bottles
10	Anti-malarial sulfadoxine + pyrimethamine (100 tabs/bottle)	1,200	1,200	600		3,000 bottles
11	Anti-malarial quinine (100 tabs/bottle)	3,150	3,150	1,575		7,875 bottles
12	Anti-malarial primasquine (100 tabs/bottle)	14,700	14,700	7,350		36,750 bottles
13	Personal computer system	1	1	1	4	7 sets
14	BHW kit	2,400	2,900	1,800		7,100 sets
15	Slide glasses (100/box)	2,100	2,100	1,050		5,250 boxes
16	Gimsa stain solution	200	200	100		500 liters
17	Blood lancet (200/box)	1,050	1,050	525		2,625 boxes
18	Surveillance system				1	1 set

Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Schedule

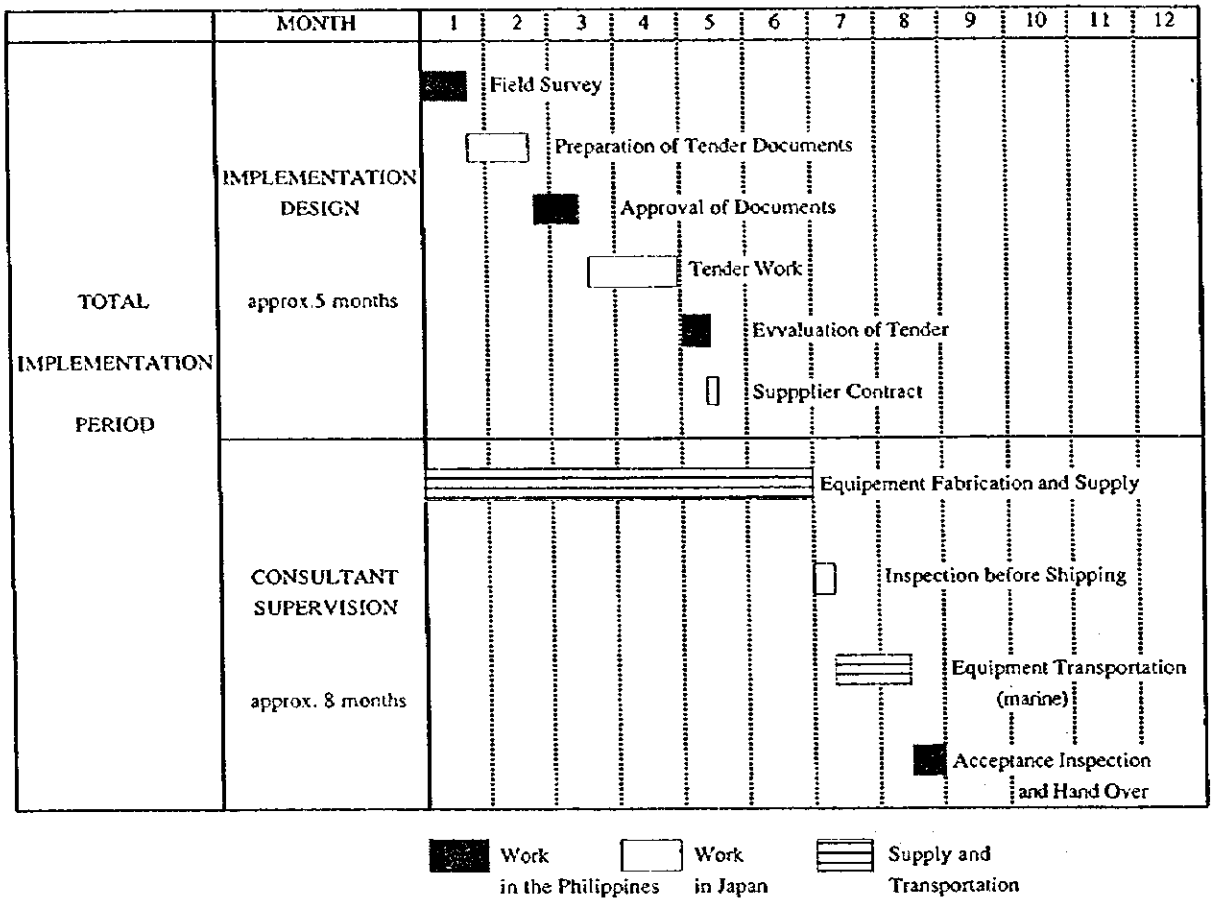
Budget year classification : Single budget year

Schedule Total Implementation Period

(Exchange of Note to Handing Over) : 12.5 Month

E/N to Supplier contract : 4.5 Month

Delivery (Contract to handing over) : 8.0 Month



3-1-2 Obligations of Recipient Country

On occasion to implement the Project, the obligation of Philippine side is explained below.

(1)To provide data and information for the Project;
(2)To make security measures for Japanese concerned with the Project who during stay in Philippine;
(3)To pay for the Banking charge;
(4)To ensure prompt unloading, tax exemption, customs clearance before entering in the Republic of Philippines. and prompt internal transportation therein of the equipment and materials for the Project puchased under the Grant Aid;
(5)To exempt Japanese juridical and phhysical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in the Republic Philippines with respect to the supply of the products and services under the verified contracts; and
(6)To maintain and use properly and efectively the equipment and materials provied under the Project.

3-2 Operation and Maintenance

Concerning the conditions of use (operation and maintenance) of the mosquito nets that are distributed to inhabitants, staff of the provincial health offices, rural health units and Balangai health units shall patrol the target areas to coat mosquito nets with insecticide and carry out diagnosis and treatment, etc. of malaria infection, and report the results of these activities to the MCS. Drugs (anti-malarial drugs) shall be left in the safekeeping of the rural health units and Balangai health units and shall be managed by local doctors and nurses, etc. As for the operation and maintenance of vehicles, motor cycles and outboard engines, the maintenance staff of the provincial health offices shall be responsible.

Chapter 4 Project Evaluation and Recommendation

4-1 Project Effect

1) Effect of Project Implementation

Via implementation of the Project and based on a comprehensive central strategy led by the Department of Health (Malaria Control Services), the said department aims to vitalize organizations and human resources on all levels including regional health offices, provincial health offices, rural health units, Balangai health units and Balangai health workers, and, based on this, strengthen the overall malaria control system and execute effective malaria countermeasures. This method is in line with the World Strategy for Malaria Control being promoted by WHO, and, moreover, the Malaria Control Services have so far accumulated experience in this area through carrying out numerous small-scale trials. The effect to be gained from the Project implementation is not just limited to the reduced prevalence of malaria through the distribution of mosquito nets and anti-malarial drugs, but epidemiological investigation activities such as surveillance and monitoring will be made possible. In view of this, it is thought that the Project has sufficient potential to become a global model case of large-scale malaria control.

2) Contribution to Beneficiaries

By distributing insecticide-coated mosquito nets to 80% of households in districts where malaria is prevalent in the target areas (resulting in 100% of households when added to the 20% which have already received mosquito nets from the Department of Health), the Project will contribute to the prevention of malaria infection and major reduction of the malaria contraction rate and mortality rate. Moreover, it is anticipated that this will lead to a reduction of malaria-carrying mosquitoes and thus an expansion of malaria-free areas. Introduction of the surveillance system, moreover, will make it possible to evaluate the disease from an epidemiological viewpoint, and this will contribute towards improving the effectiveness of malaria control programs in all the Philippines. Furthermore, the MCS has so far conducted training for MCS and local level malaria control officers with a restricted budget and insufficient drugs and equipment. In this respect, too, the Project can be expected to make a contribution in terms of strengthening the development of health workers and disseminating knowledge regarding malaria to inhabitants (the beneficiaries). In consideration of the above effects, implementation

of the Project is judged to be highly appropriate.

3) Children's Health

Based on investigation from the viewpoint of the relationship between children's health and malaria, it is known that people acquire greater immunity to malaria symptoms after living in malaria prevalent areas for many years and becoming infected with malaria a number of times. However, for infants who do not have any experience of infection, if they become infected with tropical malaria and treatment is not provided in time, serious symptoms are caused and the result is sometimes fatal. In order to prevent the serious illness and death of infants in this way, in districts where the health and medical care infrastructure is not sufficiently developed, it is essential to prevent infection using mosquito nets that are regularly coated with insecticide and to provide prompt diagnoses and appropriate treatment in cases where children do become infected. Since the Project intends to supply equipment necessary for these activities, it is judged that Project implementation will make a major contribution towards reducing malaria contraction and mortality rates among children.

The total population of areas where malaria is prevalent in the Philippines is approximately 10,000,000, of which 1,200,000, or 12%, live in the three target provinces of Palawan, Sulu and Tawi-Tawi. Moreover, in terms of the number of patients who suffer from malaria, whereas the combined total in all the Philippines is approximately 40,000, the number in the three target provinces is 13,000, or 33% of the national total. Accordingly, the direct and indirect beneficiaries of the Project will amount to 1,200,000. Moreover, by improving the situation regarding malaria prevalence in the three target provinces, Project implementation will greatly reduce the average level of malaria prevalence throughout all the Philippines. For this reason, selection of the said three provinces as the Project target areas is deemed to be appropriate.

4-2 Recommendation

Malaria is a disease that is closely linked to the natural environment found in agricultural and fishing village areas. Moreover, since the economies of the target provinces are not wealthy, in Sulu and Tawi-Tawi, many inhabitants practice fisheries and collect seaweed in coral reef waters, whereas, in Palawan, many inhabitants practice agriculture and small-scale coastal fisheries. The inhabitants of these

provinces are faced with the problems of low income and poor nutrition for children. Moreover, insufficient knowledge regarding treatment of malaria among inhabitants, combined with the underdeveloped health care infrastructure and insufficient supply of anti-malarial drugs in all the target provinces, means that there are many cases where inhabitants do not carry out proper self-care. In addition, concern is being raised over the spread of protozoa which are resistant to the conventionally used drug of chloroquine, and there are frequent cases where effective treatment is not provided in time and even provincial hospitals find it difficult to treat cases of serious tropical malaria that is accompanied by complications. In view of this situation, when it comes to implementing the Project, it is necessary to promote the town and village level development of human resources centering around Balangai health workers, in order to establish a system for providing prompt diagnoses and appropriate treatment on the local level.

In order to disseminate malaria control programs to the local inhabitant level, as aimed for by the MCS, the preparation of handbooks for health workers is essential. If such handbooks can be printed and bound through the implementation of grass roots grant support, etc., an even greater Project effect can be anticipated.

Appendix 1

Member of Study Team

1. Team reader : Toshiyuki KUROYANAGI
   Deputy Director
   Japan Intenational Cooperation Agency Phillipine Office

2. Equipment/Procurment planner 1 : Daizo ARAI
   Planning and Survey Division
   Grant Aid Management Department
   Japan International Cooperation System

3. Equipment/Procurment planner 2 : Takekazu NISHINA
   Grant Aid Management Department
   Japan International Cooperation System

Appendix 2

Survey Schedule

ITINERARY				
DATE		a: Mr. KUROYANAGI	b : Mr. ARAI	c : NISHINA
12/14	Sun		Bangkock 11 : 10 (TG620) → Manila 15:20	
		Meeting (Mr. KUROYANAGI,Miss NAGAI,Mr. NAKAMURA, Mr. ARAI, Mr. NISINA)		
12/15	Mon	Coatesty call Japanes Embassy in Philipine (Second Secretary Dr. HUKUDA)		
		Coatesty call JICA Philipine Office, WHO Office, UNICEF Office, French Embassy		
12/16	Tue	Coatesty call French Embassy, UNICEF Office		
		Meeting with Malaria Control Services (Department Of Health)		
12/17	Wed	Meeting with Malaria Control Services (Department Of Health)		
12/18	Thu	Marketing Reserch		Site surveyÅiAccompaniedÅFDr. HUKUDA, Miss NAGAI, Mr. NAKAMURA, Dr. ORTEGA Manila 04:15 (PR 123) → Sanboanga 05:50 Coatesty call Provincial Health Office (Reg' 1:4) Sanboanga 09:55 (PR 493) → Tawi-Tawi 11:00 Coatesty call Tawi-Tawi Province Health Office, Bongao City ,Division of Health Care
12/19	Fri	Marketing Reserch		Site Survey (Sankagan Village) Tawi-Tawi 11:40(by boat) → Sitankai 16:20 Site survey (Health Center of Sitankai City)
12/20	Sat	Internal meeting		Site survey (Tonmagen Village) Sitankai 09:30(by boat) → Bongao 13:30
12/21	Sun	Internal meeting		Bongao 11:25 (PR494) → Sanboanga 12:30 Sanboanga 17:05(PR128) → Manila 18:45
12/22	Mon	Discussion on the Minutes with MCS (Department Of Health) Sign on the Minutes Report to Japanese Embassy, JICA Office, NEDA		
12/23	Tue	Report to NEDA	Manila 14:45(JL747) → Tokyo19:40	

List of Party Concern

Antonio S. Lopez	Undersecretary of Health	Department of Health ; DOH
Marilyn F. Tuangui	Procurment and Logistic Service, Office for Management Services	Undersecretary DOH
Leonard I. Ortega	Officer in charge	Malaria Control Service ; MCS
Aida B. Avlvarez	Epidemiological Division	MCS
Norma DC Joson	Reserch/Planning Division	MCS
Vivian L. Young	Designning/Planning Division	MCS
Ramon A. Sulla	Designning Devision	MCS
Minda-Marie Y. Gugol	Planning/Materials and Equipment	MCS
Efren F. Aries	Planning/Materials and Equipment	MCS
Leonordo B. Recero	MCS	
Melecio N. Dy	MCS	
Joshua F. Ramos	MCS	
Sylvia S. Delosa	ARMM Municipality	MCS
Peter Samonte	Local Government Unit IV	MCS
Romeo V. Fernandez	Local Government UNit VIX	MCS
Francis Gonzales	Twi-Twi Provincial Health Office	MCS
Barjunaid T. Amilasan	Sulu Provincial Health Office	MCS
Shigeru OMI	Director Communicable Disease Prevention & Control Division WHO Manila (Western Pasific Reigonal Office)	
Lee S. Self	In charge of Malaria Control Program	WHO Manila
Vincent Voignier	Scientific Attache	Embassy of France
Gregory Boutin	Commercial Attache	Embassy of France
Hernan Jaramillo	Deputy Representative and Senior Coodinator	Programme UNICEF Manila
Akiko Nishikawa	Assistant Programme Officer	UNICEF Manila
Hikaru HUKUDA	Second Secretary	Embassy of Japan
Maki NAGAI	Staff of JICA	JICA Manila
Msatosi NAKAMURA	JICA Expart	