## United Republic of Tanzania Integrated Malaria Control Project

External Evaluator: Rui Hiwatashi, Waseda University

## 0. Summary

This project was consistent with Tanzania's policies in the health sector and specifically in malaria control, and matched the country's development needs and Japan's ODA policy. Thus, it is highly relevant. Although the Nursing Care Component came close to fully achieving its planned target, the Laboratory Diagnosis and Environmental-Management Components did not adequately achieve their planned targets. As for the achievement of the Overall Goal, although it is not possible to measure how the target values were met and to what extent the project contributed to them, the Nursing Care Component is presumed to have contributed somewhat to the Goal, and the others only to a limited extent. Hence, the effectiveness of the project is fair. While the project period of cooperation was within the plan, elements of inputs were partially inappropriate and the project cost exceeded the plan; therefore the efficiency of the project is fair. The effectiveness of the Nursing Care Component has achieved high sustainability with little concern about the financial aspects. However, in the Laboratory Diagnosis and Environmental-Management Components, some problems have been observed in the aspects of policy background, institutional and operation, technology, and finance, and therefore the sustainability of the project effects in general is fair.

In light of the above, this project is evaluated as partially satisfactory.

## 1. Project Description



Project Location (Map of Tanzania)<sup>1</sup>



District-Based Training (Nursing Care)

<sup>&</sup>lt;sup>1</sup> 16 municipalities/districts (now 17, under current administrative divisions) throughout the

#### 1.1 Background

In Tanzania, malaria has been causing socioeconomic distress among the people, along with HIV/AIDS. Malaria accounted for 40% of all outpatient diagnoses. It was estimated that 14 to 18 million people were infected with malaria each year, among which 1.1 million was hospitalized due to severe conditions and 10,000 died. Most deaths due to malaria were among pregnant women and children under five.<sup>2</sup>

To address these problems, the Ministry of Health (MOH<sup>3</sup>) of the Government of Tanzania (GOT) has formulated and implemented a National Malaria Control Program (NMCP), which focuses on "Early Diagnosis and Treatment," the methodological concept recommended by the Roll Back Malaria (RBM) partnership<sup>4</sup>.

The Japanese International Cooperation Agency (JICA) continuously supported the efforts by the GOT: cooperation activities on anti-malaria issues mainly by grant aid from 1986; in-country training courses on early diagnosis using the "Acridine Orange" (AO) method;<sup>5</sup> and management of severe malaria patients and early treatment, from 1993 to 2002. This training resulted in certification of the AO method as one of the standards by MOH and the Medical Laboratory Scientists Association of Tanzania.

In addition to the above-mentioned achievements, the GOT requested that the Government of Japan provide another round of technical cooperation in the areas of strengthening malaria case management and environmental control of *Anopheles* (malaria-spreading mosquitoes) breeding sites in urban centers.

### 1.2 Project Outline

Overall Goal	Malaria mortality is reduced						
Project Objective	1. Evidence-based malaria case management with the focus						
	on nursing care and diagnosis of patients is improved in						

country were selected as actual project locations.

<sup>&</sup>lt;sup>2</sup> Ex-Ante Evaluation Report (2004).

<sup>&</sup>lt;sup>3</sup> Renamed Ministry of Health and Social Welfare (MOHSW) during the project.

<sup>&</sup>lt;sup>4</sup> The RBM partnership is the global framework to implement coordinated action against malaria, forged by the World Health Organization (WHO) and its member countries.

<sup>&</sup>lt;sup>5</sup> The AO method is one of the microscopic diagnoses for malaria, invented in 1991 by Professor Fumihiko Kawamoto, then of Nagoya University. The method is superior in terms of expeditiousness, accuracy, and simplicity compared to the traditional method, Gimsa, and entails the use of a microscope with a halogen lamp.

	health facilities.
	2. A sustainable environmental-management model to reduce
	Anopheles breeding sites is established.
Outputs	(Nursing Care Component)
1	1. District nurse trainers improve their training skills in
	nursing care of malaria by training of trainers (TOT).
	2. The knowledge and skills of the district nurse trainers are
	adequately transferred to nurses by means of cascade
	training
	(Laboratory Diagnosis Component)
	3 Laboratory technicians acquire skills and knowledge to
	examine blood slides by means of the AO method to
	conduct user maintenance of AO microscopes and to report
	laboratory practices to the Council Health Management
	Team (CHMT).
	4. Health facilities can properly maintain AO microscopes
	and procure AO consumables.
	(Environmental-Management Component)
	5. Existing malaria drains <sup>6</sup> in Dar es Salaam are cleaned.
	6. The communities in Dar es Salaam can properly manage
	their environment to control <i>Anopheles</i> .
	Japanese Side:
	1. Experts
	One for long-term, six for short-term
	2. Equipment $36,320,000 \text{ yen}^7$
	3. Local Cost 122,290,000 yen
	4. Other
Inputs	Project Monitoring Mission (February 2007)
*	Terminal Evaluation Mission (July 2007)
	Tanzanian Side:
	1. Two counterparts
	2. Land and Facilities, Project Office, Utilities
	3. Local Cost (spare parts and consumables for microscopes,

<sup>&</sup>lt;sup>6</sup> Drains with breeding sites of *Anopheles*.
<sup>7</sup> Based on the exchange rate of 1 Tanzanian shilling (Tsh) to 0.11 Japanese yen, as of November 30, 2007.

	etc.), Counterpart Salary, Seminars (other than those for				
	which the Japanese side bore the costs)				
Total Cost	290,000,000 yen				
Period of Cooperation	November, 2004–November, 2007				
Implomenting Ageney	Ministry of Health and Social Welfare (MOHSW)				
Implementing Agency	National Malaria Control Programme (NMCP)				
Cooperating Agency	None				
in Japan					
	Projects related to malaria control implemented continuously				
	from 1988 to 2002 (in-country training courses, etc.);				
	International Parasite Control Project in Kenya; Urban Malaria				
	Control Project (Swiss Tropical Institute [STI] and Bill &				
	Melinda Gates Foundation); Pilot Project for Malaria Control				
	(Global Fund to Fight AIDS, Tuberculosis and Malaria				
Related Projects	[GFATM], STI, and Princeton University); the common basket				
(if any)	fund for the health sector; projects for bed nets (GFATM,				
	United Nations Children's Fund [UNICEF], the Government of				
	Switzerland, the British Embassy in Tanzania, the Netherlands				
	Embassy in Tanzania, international NGOs, etc.); assistance for				
	drafting of guidelines on and ensuring supply of curative drugs				
	for malaria in Zanzibar (GFATM); and overall assistance for				
	national malaria control (WHO's RBM office).				

#### 1.3 Outline of the Terminal Evaluation

#### 1.3.1 Achievement of Overall Goal

As the latest data for malaria death rate available at the time of the Terminal Evaluation were collected in 2005, it was not possible to measure the contribution of this project, which started in 2004.

## 1.3.2 Achievement of Project Objective

The Nursing Care Component achieved its planned project objective. The Laboratory Diagnosis Component mostly achieved the project objective—at more than 80% of health facilities, the provided AO microscopes were being operated and the overall system

(diagnosis record management, quality management, AO microscope maintenance, consumables procurement, etc.) established by the project was functioning at the time of the Terminal Evaluation. The Environmental-Management Component also achieved many of the planned objectives.

#### 1.3.3 Recommendations

Nursing Care Component: It was recommended that: 1) the training module be widely shared through workshops or conferences among stakeholders in Tanzania as well as from overseas; 2) the training module be utilized through pre-service as well as in-service training in order to spread knowledge nationwide; 3) for further expansion of training especially on a regional level, the execution structure of cascade training may need to be strengthened by establishing a coordinating function on the regional level; and 4) the NMCP should have the training module reviewed and modified based on its new policy and on studies.

Laboratory Diagnosis Component: It was recommended that: 1) the role of the NMCP to supervise and provide technical guidance and support for laboratories on regional and district levels be strengthened; 2) the availability and distribution of quality supplies be ensured; 3) a resource directory, which may contain contact places for repair and other information, be prepared and distributed to health facilities, by the end of the project. It was also recommended that: 4) a concrete strategy of applying different diagnosis methods be prepared; 5) the role of microscopic diagnosis be clarified by the NMCP; and 6) MOHSW explore the possibility that the region might play a technical-backstopping role for district-level microscopic diagnosis after the termination of the project.

Environmental-Management Component: It was recommended that: 1) further analysis be made by the end of the project to determine the effectiveness of the work; 2) collaboration among communities, local government, and MOHSW be enhanced; and 3) these three actors continue disseminating knowledge on malaria prevention.

#### 2. Outline of the Evaluation Study

#### 2.1 External Evaluator

Rui Hiwatashi, Waseda University

#### 2.2 Duration of Evaluation Study

Duration of the Study: December 2010–December 2011 Duration of the Field Study: February 14 to 27 and July 19 to August 1, 2011.

#### 2.3 Constraints During the Evaluation Study (if any)

The target indicator levels for the objectives and outputs of this project were not set from the designing phase until the termination of the project period. The selected indicators also turned out not to be very suitable for use in the evaluation, monitoring, and implementation of the project. The baseline data for the overall goal and project objectives were lacking as well. Additionally, it was not before 2008, the year in which the "NMCP Monitoring and Evaluation Plan 2008–2013" was developed, that state-of-the-art indicators and reliable data for malaria control were set and collected comprehensively in Tanzania. Hence, quantitative before-and-after comparison is conducted only to a limited degree in this report.

## 3. Results of the Evaluation (Overall Rating: C<sup>8</sup>)

3.1 Relevance (Rating:  $(3)^9$ )

#### 3.1.1 Relevance to the Development Plan of Tanzania

During the project-design phase from November 2003 to February 2004, MOH was implementing its "*NMCP Medium-Term Strategic Plan 2002–2007*" as the principal policy for malaria control. The medium-term plan focused on Early Diagnosis and Treatment, the basic principle under the RBM partnership, and set vector control as one of the main strategies. Hence, it is considered that the components of this project were selected in accordance with the country's policy priorities.

The Nursing Care Component also conformed to the methodologies and measures listed in the strategic plan, including the improvement of guidelines and working references and the expansion of training courses. However, the strategic plan did not recommend any specific diagnostic methodology for the promotion of early malaria diagnosis. In fact, the characteristic of the AO method is expeditiousness, not only which

<sup>&</sup>lt;sup>8</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>&</sup>lt;sup>9</sup> ③: High, ②: Fair, ①: Low

materializes *early* diagnosis. This was also pointed out during the project-design phase, emphasizing that the method would fully contribute to the promotion of Early Diagnosis only when it could be properly utilized at the health facility level.

With regard to vector control, while rehabilitation and maintenance of malaria drains was referred to in the strategic plan as a cost-effective measure, the approach of community-based cleaning and maintenance, on which this project focused, was not mentioned.

The strategic plan continued implementation without any major change until the time of the termination of the project in November 2007. However, as the malaria control effort in Tanzania is significantly affected by GFATM both technically and financially, MOHSW decided to focus attention on the dissemination of rapid diagnostic tests (RDTs), which was one of the GFATM's recommendations, and to drastically scale down the component of microscopic diagnosis in the preparation of a GFATM grant proposal in 2007, resulting in approval from GFATM. In this way, the Laboratory Diagnosis Component of the project came to conform less to the country's policy direction. The project's approach of community-based cleaning and maintenance remained unmentioned in the mid-term plan for the following term, 2008–2013. While it might have been difficult to forecast the future mainstreaming of diagnostic methodologies in the project-design phase, the sustainability of the project's achievement was affected, as described later, by this fade-out of conformity with policies at the level of specific methodologies or approaches.

#### 3.1.2 Relevance to the Development Needs of Tanzania

The latest statistics at the project-design phase<sup>10</sup> showed that the number of malaria patients amount (as of 2000–03) annually to 1.4 to 1.8 million, accounting for 40% of all outpatients in Tanzania. Of them, 1.1 million have had to be hospitalized due to their severe conditions, and over 10,000 deaths occurring among them are attributable to malaria. Malaria was one of the major diseases in Tanzania, along with HIV/AIDS. Most deaths due to malaria were among pregnant women and children under five. Hence, there was a huge need for assistance of efforts in malaria control.

Additionally, it was stated in the 2003 report on the interim evaluation of the NMCP medium-term plan that efforts for increasing the use of bed nets have been sufficient and that there is no major funding gap at the present time. It was an appropriate approach for

<sup>&</sup>lt;sup>10</sup> The statistics in this paragraph come from the Ex-Ante Evaluation Report of the project and the *NMCP Medium-Term Strategic Plan 2002–2007*. They were originally cited from statistics for 2000 to 2003 compiled by the WHO and the GOT.

this project to select areas with technical and financial needs considering demarcation to other donors.

#### 3.1.3 Relevance to Japan's ODA Policy

Japan's strategies for global malaria control are based on the Hashimoto Initiative for Global Parasite Control, proposed in 1997, and the Okinawa Infectious Disease Initiative, announced in 2000.

The Country Assistance Program for Tanzania, formulated in 2000, which was effective during the project-design phase, stated that it would be important to continue the provision of medical equipment to key hospitals and malaria control projects, focusing especially on enhancement of medical care services in rural areas.

Therefore, this project has been consistent with Japan's basic strategy for malaria control and with its assistance policy for Tanzania.

This project has been highly relevant to Tanzania's development plan and development needs as well as Japan's ODA policy; therefore, its overall relevance is high.

3.2 Effectiveness and Impact (Rating: 2)

In this project, there was no quantitative target level set in advance for indicators of the overall goal, project objectives, and outputs for this project. Although indicators were defined on the project design matrix (PDM), the progress of the project was monitored only qualitatively. It was only when the Project Monitoring Mission was dispatched in February 2007 that the indicators were revised to be measurable quantitatively. Therefore, the below evaluation does not include quantitative comparison with planned targets.

3.2.1 Effectiveness

3.2.1.1 Project Output

#### [Nursing Care Component]

Output 1: District nurse trainers improve their training skills in nursing care of malaria by TOT.

Pre- and post-test results on project TOT (Table 1) showed that average scores

increased by 29-40 points from pre-test to the post-test, with approximately 80% in score.

Indicator*	Achievement
1) Number of district nurse trainers	34
who participated in training	
courses	
2) Proportion of the participants who	Average scores:
passed the post-test at each	- for the training course held in January 2006
training session for district nurse	increased from 53% for pre-test to 82% for
trainers	post-test.
	- for November 2006, increased from 35% to
	79%.

Table 1 Achievement of Output 1

Source: Terminal Evaluation Report (Aug 2007) and Final Report (Jan 2008) of the project

\* No target value was set for indicators from the design phase to the termination of the project.

Interviews with and replies to the questionnaire from medical and nursing officers in the 17 targeted districts/municipalities show that the nurse trainers from 16 districts/municipalities acquired the capacity to conduct district-based training (no response from the other district).

Furthermore, a beneficiary survey<sup>11</sup> shows that nearly all of the surveyed nurses (103 out of 104 samples) who participated in training by district nurse trainers were satisfied. The major satisfying factors were: focus on children under five years of age (answered by 80); focus on pregnant women (70); and facilitation of trainer (63).

Hence, Output 1 is considered to have been achieved, as the district trainers for nursing care of malaria improved their capacity enough to continuously conduct district-based training.

# Output 2: The knowledge and skills of the district nurse trainers are adequately transferred to nurses by means of cascade training.

The comparative analysis conducted in the project (see Table 2) between the survey for

<sup>&</sup>lt;sup>11</sup> Survey questionnaires were sent to 128 field nurses who participated in district-based training courses supported by the project and were followed by in-person or telephone interviews when needed. A total of 104 answers were collected from all 16 targeted districts/municipalities.

baseline (176 samples) and for impact (92 samples) regarding district-based training showed that average scores increased by 30 points from baseline to impact, with approximately 70% in score.

	Indicator*	Achievement
1)	Number of nurses trained by	558
	district nurse trainers	
2)	Proportion of participants who	Average scores for all of the training sessions
	passed the post-test at each	conducted during the project period increased from
	cascade training session for	39.2% for pre-test to 72.3% for post-test (with the
	nurses	increase apparent in all of the targeted
		districts/municipalities).

Table 2 Achievement of Output 2

Source: Terminal Evaluation Report (Aug 2007) and Final Report (Jan 2008) of the project

\* No target value was set for indicators from the design phase to the termination of the project.

This impact survey also showed, as indirect evidence, that patients and caretakers leaving the hospital better understood information given by nurses after as compared to before the training.<sup>12</sup>

Furthermore, the beneficiary survey shows that the district nurse trainers made good use of the curriculum and teaching materials developed through the project when conducting training sessions, which enjoyed a high reputation from participants. In this survey, most participant nurses answered that their self-efficacy was increased through the training sessions (99 nurses out of 104). Some concrete examples of skill improvement reported by the respondents were: improved skill in primary diagnosis; stronger confidence and more knowledge about cases that can be dealt with as prescribed in the manual; and better instructions about points such as drinking sufficient water.

It also indicated that the training content was adequate in terms of sustainability of the training effect and of ease of dissemination at the field level: 95 nurses out of 104 currently refer to the training materials more than once every few months; and 83 nurses have had the opportunity to conduct training for their colleague nurses who did not receive training in the project.

Hence, Output 2 is considered to have been achieved, as the knowledge and skills of

<sup>&</sup>lt;sup>12</sup> Fifty-five inpatients and their caretakers were asked six basic questions that needed to be understood correctly by them at the time of discharge from hospital, both before and after nurse training. The average score for all the questions improved after the nurses participated in the training session.

the district nurse trainers are adequately transferred to nurses, leading to the enhancement of their practical capacities.

This component was successful in encouraging initiative on the Tanzanian side because it adopted a hierarchical training system, called a "cascade approach,"<sup>13</sup> in light of Tanzania's administrative structure in the health sector. In order to make this system run and maintain quality of sessions during implementation, the project consolidated training materials and protocols—the training package contained a comprehensive curriculum including monitoring activities as well as a standard budget model for reference in budgeting at a district level. Furthermore, the project utilized low-tech tools such as printed flip charts so that training sessions could be held in rural areas with no electricity and involved local human resources (both trainers and participants) from early on, with the aim of developing user-friendly materials for training. These various efforts are also considered to have contributed to its achievement.

#### [Laboratory Diagnosis Component]

Output 3: Laboratory technicians acquire skills and knowledge to examine blood slides by means of the AO method, to conduct user maintenance of AO microscopes and to report laboratory practices to the Council Health-Management Team (CHMT).

Pre and posttest results conducted during the training course for laboratory personnel (Table 3) showed that average scores increased by 10–30 points from pretest to posttest, with average scores higher than 85%.

	Indicator*		Achievemen	t	
1)	Number of laboratory technicians	95			
	who participated in the training				
	courses				
2)	Proportion of participants who			Averag	e score
	passed the posttest at each training			Pretest	Posttest
	session for laboratory technicians	September	Sensitivity	75.5%	93.1%
		2005	Specificity	76.5%	86.3%

Table 3 Achievement of Output 3

<sup>&</sup>lt;sup>13</sup> The training programme was implemented in three steps: (1) NMCP-trained national trainers; (2) TOT for district nurse trainers by the national trainers; and (3) district-based training.

	January 2007	Sensitivity	58.0%	87.5%
		Specificity	90.9%	89.8%
	September 2007	Sensitivity	71.1%	91.1%
		Specificity	80.0%	93.3%

Source: Terminal Evaluation Report (Aug 2007) and Final Report (Jan 2008) of the project

\* No target value was set for indicators from the design phase to the termination of the project.

Interviews with and replies to the questionnaire by medical officers and laboratory technicians in the targeted districts/municipalities show that in the nearly all of these districts/municipalities (16 out of 17), the effect of the training courses was satisfactory.

Some concrete examples of acquired skills reported by the respondents were the AO diagnosis procedure; comprehension of proper combination with other methods; and techniques for daily maintenance and fine-tuning.

Hence, Output 3 is considered to have been achieved, as the most laboratory technicians who participated in the training courses learned how to conduct laboratory diagnosis of malaria by the AO method and acquired the knowledge, techniques, and procedures to operate and maintain AO microscopes.

Output 4: Health facilities can properly maintain AO microscopes and procure AO consumables.

It had been repeatedly emphasized since the project-design phase that the key factor for successful diffusion of AO diagnosis was to establish systems for maintenance of microscopes and procurement of related consumables and spare parts. According to an interview with the Japanese long-term expert, the project aimed to implement a variety of strategies to diffuse the AO method all over the country as one of the standard methodologies of laboratory diagnosis in Tanzania, knowing existence of many difficulties in building the systems. There was an expectation that once the method was diffused widely in the country, the distribution of consumables and spare parts would be secured on a commercial basis.

The survey on utilization of the AO microscopes conducted by the project in June 2007 (49 facilities surveyed of the 65 where the microscopes were supplied)<sup>14</sup> revealed that

<sup>&</sup>lt;sup>14</sup> When the external evaluator reviewed the original list for this survey, however, the number of surveyed facilities was 48.

while 41 microscopes were utilized, eight were not,<sup>15</sup> mainly due to absence of trained laboratory technicians.

However, it is observed at the time of this evaluation survey that the problematic situation has not yet been improved where a broken microscope is not properly repaired or spare parts and consumables are not available;<sup>16</sup> although this issue was already recognized during the implementation of the project.

When the original list for the survey on AO-microscope utilization was rechecked taking the above-mentioned background into account, about eight cases among hospitals/health facilities with the status "AO microscope being utilized with some problem" might have possibly remained unutilized after the time of this survey. Those problems were (1) the hospital's policy did not put a strong focus on the AO method (2) human resources and skills were lacking due to the transfer, resignation, and/or study abroad of trained lab-technicians (3) broken microscopes had not been repaired and (4) consumables such as AO reagent and spare parts were not available. There is a possibility, according to this analysis, that up to 19 hospitals/health facilities among those surveyed might have already stopped utilizing their microscopes at the time of the survey.

The interviews with and replies to the questionnaire from the officers in the targeted districts/municipalities show that most of them (16 out of 17) cannot afford the needed consumables, as the AO method has not been mainstreamed and thus is not prioritized in budgeting. Other problems are also reported: for example, cases are seen where AO reagent is not available due to lack of distribution even in cases where the budget is allocated; or shorted-out microscopes remain unrepaired and unreplaced due to lack of human resources and skills of zonal workshops, and lack of distribution of necessary spare parts.<sup>17</sup>

During the project-design phase, the Japanese side expected that it would be possible to secure a stock of relevant products by steady negotiation with the government agency responsible for medical procurement and that it would be feasible to establish a system for microscope maintenance when it was seen that the project would help organizational and individual capacity in the refinement centers. However, this expectation was not realized. The policy-level focus on the AO method was lost, and negotiation could not secure a stock or distribution of needed products for repairs.

<sup>&</sup>lt;sup>15</sup> The original list of the survey also showed that 11 microscopes, not eight, were unutilized. <sup>16</sup> The lack of appropriate repair availability may be attributed to lack of a system for local procurement of as many as 2,000 different spare parts for one microscope, as well as insufficient organizational/individual capacity of the country's agency responsible for the repair of microscopes. Details are in Section 3.4.2 (Institutional and Operational Aspects of the Implementing Agency).

<sup>&</sup>lt;sup>17</sup> These problems are detailed later in Section 3.4 (Sustainability).

Hence, Output 4 is considered not to have been achieved, as systems for hospitals/health facilities to maintain AO microscopes and procure consumables were not established.

#### [Environmental-Management Component]

The objective of this component was to establish a model for community-based management of malaria drains. The project planned to pick up target drains and communities and facilitate community-based activities for cleaning and maintenance of drains that would lead to establishment of strong systems for environment management.

Output 5: Existing malaria drains in Dar es Salaam are cleaned.

The project selected two drains in Dar es Salaam containing *Anopheles* mosquito breeding sites and cleaned them as described in Table 4 below. The initial plan had been to have the drains cleaned by community people themselves, but as both the scale of the drains and the volume of dumped wastes far exceeded expectations, the project decided to contract a private company to clean the drains with heavy machines.

Table 4Achievement of Output 5

Indicator*	Achievement
The distance of drains in Dar es Salaam	1.7 km (Mtoni ward)
cleaned during the project period	2.1 km (Magomeni ward)

Source: Terminal Evaluation Report (Aug 2007) and Final Report (Jan 2008) of the project

\* No target value was set for indicators from the design phase to the termination of the project.

It can be said that the output "to clean" drains itself was achieved. However, as this was done by means of financial input from Japan and private contractors with heavy machines, the result was different from what had been originally expected—that the experience would be disseminated widely as a model of community-based environment management.

## Output 6: The communities in Dar es Salaam can properly manage their environment to control *Anopheles*.

The project conducted education activities involving community leaders and members

as described in Table 5 below for the selected communities to establish systems for environment management.

		*					
Indicator*	Achievement						
Proportion of	-	Community leaders' seminars:					
Wajumbe (community		18 (550 leaders)					
leaders) who	-	Mass meetings:					
disseminate		10 (4,000 community members)					
knowledge learned in	-	Community education through seminars and household					
seminars		visits by Community Owned Resource Persons (CORPs):					
		109,164 community members					

Table 5 Achievement of Output 6

Source: Terminal Evaluation Report (Aug 2007) and Final Report (Jan 2008) of the project

\* No target value was set for indicators from the design phase to the termination of the project.

The "Best Practice" document prepared based on project activities showed that the involvement of communities was successful and cleaning activities were implemented by community people on a large scale, along with massive cleaning by heavy machines.

However, as the Best Practice document and follow-up survey report pointed out and the field visit in the ex-post evaluation confirmed, the condition of one of the cleaned drains was soon as bad as before cleaning, because community people resumed dumping waste into the drain after the cleaning. According to an officer on Dar es Salaam city council, some of the primary causes were: the river into which the drain flows was so stagnant (due to lack of periodic massive maintenance by civil workers using heavy machines) that community cleaning only would not be visibly effective to improve the environment; thus, community people came to feel that community-based environment management would not work, and they did not have a proper place for dumping, as the public waste-management system was not functioning.

It must be pointed out that the project could not control all these constraints, but the establishment of a system for environment management cannot be observed outside of their context.

#### 3.2.1.2 Achievement of Project Objectives

1) Project Objective 1 Evidence-based malaria case management with the focus on nursing care and diagnosis of patients is improved in health facilities.

#### [Nursing Care Component]

Indicator 1.	The	knowledge,	attitude	and	performance	of	nurses	in
	mar	nagement of m	nalaria pat	tients	are improved.			

- Indicator 2. The satisfaction of patients with services provided is improved in the following areas:
  - Nursing care of inpatients with malaria
  - Health education of inpatients and outpatients
- Indicator 3. Project activities are institutionalized from the following perspectives:
  - Official recognition of the training models by the government of Tanzania
  - Integration of the budget for the project activities into CCHP

\* No target value was set for indicators from the design phase to the termination of the project.

As discussed earlier in the context of Outputs 1 and 2, it is considered that the knowledge, attitude, and practical skills of nurses were improved and it is observed that patients and caretakers leaving the hospital better understood the information given by nurses compared to before the training.

The training materials developed by the project were adopted as MOHSW's official documents to take up unique identification numbers of the Malaria Control Series of NMCP.

A survey conducted during the project period in the 46 districts that participated in the advocacy seminar showed that at least 21 districts had integrated their budgets to include training in nursing care for malaria patients into their council plans for 2007/2008. The questionnaire survey and interviews with NMCP officials conducted in the ex-post evaluation also indicate that the training model established by the project would expanded throughout the country in the latest *Medium-Term Strategic Plan* of NMCP, and that this plan has actually been implemented with funding from the donors like the United States and Tanzanian governments, using the same curriculum and training materials as the MOHSW/JICA project. Although the conditions of the training model's continuous

implementation may vary among districts/municipalities, the questionnaire survey shows that since this model has been widely implemented when sufficiently financed by donor funds or other measures; the project's activities have been almost institutionalized. This component was successful, as mentioned earlier, in encouraging initiative on the Tanzanian side in terms of financial and human resources, as the project adopted a cascade approach.

Hence, as far as the Nursing Care Component is concerned, Project Objective 1 has almost been achieved.

#### [Laboratory Diagnosis Component]

Indicator 4.	The	accuracy	of	blood-slide	examination	results	for	febrile
	cas	es is increa	asec	1.				

Indicator 5. The proportion of blood slides used for diagnosis of malaria is increased at health facilities.

\* No target value was set for indicators from the design phase to the termination of the project.

As discussed earlier with regard to Outputs 3 and 4, the effects of the training courses, such as improvement in the accuracy of the blood-slide examination and the utilization of microscopes, were observed for a certain period after the implementation of the training. However, at least 10 to 20 microscopes provided to hospitals/health facilities later became un- or incompletely utilized owing to breakdowns and other problems before the project ended.

Hence, as far as the Laboratory Diagnosis Component is concerned, Project Objective 1 has not been achieved.

2) Project Objective 2 A sustainable environmental management model to reduce Anopheles breeding sites is established.

[Environmental Management Component]

Indicator 6. The number of mosquito (Anopheles) breeding sites in the selected target areas of Dar es Salaam has decreased.

\* No target value was set for indicators from the design phase to the termination of the project.

According to a report that compared the project with another one, which focused on larvicide, to analyze the difference in malaria infection rate between these cases<sup>18</sup>, the drain-cleaning approach adopted by the project had a statistically significant positive effect. The report also showed that the drain-cleaning intervention contributed to decreasing malaria infection rates when compared to the pre-intervention condition of the same area and to areas that had not received this intervention.

These findings suggest that the number of mosquito breeding sites in the selected target areas decreased for a certain period after the cleaning with heavy machines funded by financial inputs by the project. However, the interviews in the ex-post evaluation as well as this comparison analysis report indicate that the condition of one of the cleaned drains became as bad as it was before cleaning because the community residents resumed dumping waste into the drain soon after the cleaning. The interviews attributed this setback to the fact that the maintenance portion of the budget of the said area was limited and was allocated to the civil engineering division, not the public health division, resulting in inadequate implementation of environment maintenance for vector control of malaria.

The project aimed to establish a management model. The NMCP's latest *Medium-Term Strategic Plan (2008–2013)* refers to the project activities as "Best Practice," indicating that these will be adopted in other urban areas. Nevertheless, according to the interviews in the ex-post evaluation, community-based environmental management is only viable when it comes with civil engineering with respect to rivers and drains, and waste management systems, especially garbage collection. Several NMCP officials and the public health officer from Dar es Salaam City Council opined that the said model cannot be implemented in a sustainable manner in the absence of good interministerial or interdepartmental coordination between the public health and civil engineering divisions. Although this challenge had already been recognized during the project-design phase and the project was expected to address it, the result was not satisfactory.

Accordingly, the project should have also supported coordination with or advocacy to ministers and departments responsible for civil engineering and waste management.

Hence, Project Objective 2 has been achieved only partly in terms of the cleaning of the targeted drains, and not at all in terms of the establishment of the model.

To sum up, although the planned target (Indicators 1 to 3) of the Nursing Care

<sup>&</sup>lt;sup>18</sup> Marcia Caldas de Castro (Department of Global Health and Population, Harvard School of Public Health), "Environmental Management of Anopheles Breeding Sites in Dar es Salaam—Phase III: Evaluation of EM Activities—Final Report—October, 2008."

Component was almost achieved, the planned target of the Laboratory Diagnosis Component (Indicator 4 and 5) and the Environmental-Management Component (Indicator 6) was not fully achieved. Hence, the objectives of this project were achieved to a certain degree; therefore its effectiveness is fair.

3.2.2 Impact

- 3.2.2.1 Achievement of Overall Goal, "Malaria Mortality is Reduced"
- 1) Indicator 1. Malaria mortality countrywide
  - \* No target value was set for indicators from the design phase to the termination of the project.

The malaria mortality rate is considered very difficult to measure.<sup>19</sup> In Tanzania, this rate varies depending on the information source. The countrywide malaria mortality rate is not adopted as indicator in the "*NMCP Monitoring and Evaluation Plan 2008–2013*," which is being implemented at the time of the ex-post evaluation. As described in Table 7, according to WHO statistics, the absolute number of malaria deaths and their ratio to the total population of Tanzania have been declining.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Population	35,30	36,23	37,18	35,92	36,58	36,76	37,44	39,38	40,21	41,04
(thousand)	6	2	8	2	8	6	5	4	3	9
Malaria		1 220	0.15	15,25	19,85	18,32	20,96	12,59	12,43	0.40
(reported)	-	1,228	8,15	1	9	2	2	3	4	840
Malaria										
Mortality Rate	-	3	2	42	54	50	56	32	31	2
(per 100 k)										

 Table 7 Number and Rate of Malaria Deaths in Tanzania

Source: WHO World Malaria Report 2010 and US Census Bureau

However, it is difficult to measure the contribution of the project to the decline of the malaria mortality rate. This was repeatedly pointed out by NMCP officials in the interviews. Malaria control in Tanzania has been extensively done in partnerships with

<sup>&</sup>lt;sup>19</sup> e.g. WHO, "Malaria deaths are the hardest to count," *Bulletin of the World Health Organization*, Volume 84, Number 3, March 2006. http://www.who.int/bulletin/volumes/84/3/news10306/en/

many donors and using various approaches, including facilitation of the use of insecticide-treated nets (ITNs), indoor residual spraying (IRS), and artemisinin-based combination therapy (ACT), as well as the methods adopted by the project. RDTs became mainstreamed in the laboratory diagnosis of malaria during the project period, as mentioned earlier, and larviciding has been emphasized recently in environmental management for malaria control.

It is also extremely difficult to measure the contribution of nursing-care training in malaria treatment and the introduction of AO diagnosis to the nationwide results of project activities in only 17 target areas.

Having said that, the Nursing Care Component, which was continuously implemented after the termination of the project, is presumed to contribute to the decline of the malaria mortality rate in various ways. In particular, as one of the aspects of the component was to facilitate a steady expansion of ACT, it appears certain, generally speaking, that it has contributed to the decline of the malaria mortality rate through this expansion. It is impossible, however, to quantitatively evaluate the extent of the contribution, because the necessary conditions to quantify it, such as the other determinants of the malaria mortality rate, collection of baseline data of the targeted areas, or time-series data of uncontrolled areas for comparison, were not satisfied.

In addition, the project had not set a target value for the indicators, and it has been unclear how the project identified and understood the baseline situation and what the extent was of the expected effects. From this viewpoint as well, it is impossible to quantitatively evaluate the achievement of this Overall Goal of the project. As for the Laboratory Diagnosis and Environmental-Management Components, considering that their effects were not sustainable after the termination of the project, they contributed only to a limited extent to the achievement of this Overall Goal of the project.

2) Indicator 2 The malaria mortality in urban centers of Dar es Salaam

\* No target value was set for indicators from the design phase to the termination of the project.

During this ex-post evaluation, the time-series malaria mortality rates in Dar es Salaam city were not available. According to an interview with an official on the city council, state-of-the-art, reliable statistics have begun being collected only recently, with the implementation of the *NMCP Monitoring and Evaluation Plan 2008–2013*.

To sum up the above discussion, this project has had some success in achieving its objectives; therefore its effectiveness is fair. Of the Project Objectives, while Indicators 4 to 6 were not fully achieved, Indicators 1 to 3 were achieved. As for the achievement of the Overall Goal, although it is not possible to measure how the target values were met and to what extent the project contributed, the Nursing Care Component is presumed to have notably contributed to the Goal, and the other components only to a limited degree.

### 3.3 Efficiency (Rating:2)

Inputs	Plan	Actual Performance
(1) Experts	One long-term	One long-term
	Five for short-term	Six for short-term
(2)Trainees received	N/A	N/A
(3)Third-Country	N/A	N/A
Training Programs		
(4) Equipment	AO microscopes	AO microscopes
	Solar generator	Solar generator
Total Project Cost	227,180,000 yen	290,340,000 yen
Total Local Cost	Spare parts and consumables	Spare parts and consumables
	for microscopes	for microscopes
	Counterpart Salary	Counterpart Salary
	Expenses for seminars other	Expenses for seminars other
	than those borne by the	than those borne by the
	Japanese side	Japanese side
	(amount not available)	(amount not available)

#### 3.3.1 Inputs

#### 3.3.1.1 Elements of Inputs

According to a project document produced at the termination of the project, the Japanese experts were deployed mostly as planned. However, a project coordinator was also deployed, since the workload of the long-term expert was heavier than expected. According to the long-term expert, the workload related to logistics became heavier as the project progressed to cover a wide area. Although in the first year the situation had been addressed by local staff allocation, the project required an additional Japanese staff member to be deployed locally for the second year.

It had been difficult to estimate workload properly before launching the project, considering that it consisted of multiple components involving collaboration with multiple counterpart organizations and departments and covered target areas nationwide. However, as the long-term expert pointed out, it can be considered that normally the project coordinator is deployed from the beginning of the project, given that logistics issues increase naturally in a project involving capacity development, system building, and nation-wide expansion, and that it is generally difficult in African countries to secure local human resources that can play an appropriate middle-management role.

The project spent 36 million yen for equipment, which amounted to 23% of the total local cost of 159 million yen. Most of this amount was for AO microscopes and related equipment. Considering the current usage situation of the microscopes, this input is not considered to have been cost effective. It might have been better if more of the input had been allocated to enhancement of the system for procurement of spare parts and reagents and additional implementation of training at the zonal repair centers.

#### 3.3.1.2 Project Cost

The actual project cost was higher than planned. It was 290,350,000 yen, 128% of the planned 227,180,000 yen.<sup>20</sup>

3.3.1.3 Period of Cooperation

The actual period of cooperation was 36 months, which was as planned.

Hence, although the project period of cooperation was within the plan, elements of inputs were partially inappropriate and project cost exceeded the plan, therefore efficiency of the project is fair.

3.4 Sustainability (Rating: 2)

3.4.1 Related Policy Surrounding the Project

Tanzania's ongoing *Health Sector Strategic Plan III 2009–2015* keeps its emphasis on the importance of malaria control, as before. However, it does not mention any concrete

<sup>&</sup>lt;sup>20</sup> The reason for the difference could not be determined, as the breakdown of the planned budget was not available at the time of this evaluation.

methodology for nursing care and laboratory diagnosis of malaria, but rather focuses on ITNs and IRS. It is planned to expand environmental management for vector control, but no detailed approach such as community-based drain cleaning is specified.

Nursing care and laboratory diagnosis of malaria remain a priority in the *NMCP Medium-Term Strategic Plan 2008–2013*. As for nursing care, it is planned to spread training for nurses on appropriate treatment of malaria patients to peripheral health facilities all over the country, for which, according to interviews with NMCP officials, the training package developed through the project has been utilized almost as it was during the project period.

As for methodologies of laboratory diagnosis of malaria, while the expansion of use of RDTs is emphasized, the AO method is unmentioned and the microscope in general is referred to as something to be utilized situationally.<sup>21</sup> NMCP officials, and medical officers and laboratory technicians in municipals or districts interviewed for this evaluation were of the opinion that AO diagnosis remains effective and necessary for Tanzania's malaria-control efforts, even if RDTs has been mainstreamed.<sup>22</sup> However, the AO method has been less prioritized at the policy level, at least in the current *Medium-Term Strategic Plan*.

Environmental management has been considered in context of applying best practice in Dar es Salaam City to other urban areas. The health officer on the city council who formulated this policy for the Strategic Plan affirmed that "best practice" here implies the use of the approach adopted in the project. At the same time, however, it was also pointed out, as mentioned earlier, that the materialization of this policy would be possible only when budget allocation and planning coordination could be harmonized with those for civil engineering of rivers, drains, and waste-management infrastructure. The detailed approach focused on in environmental management is larviciding, which can be easily adopted elsewhere and produces a noticeable effect.

3.4.2 Institutional and Operational Aspects of the Implementing Agency

NMCP has been the key organization for the implementation of policies for malaria control in Tanzania. In NMCP's organizational structure, in the same way under the current *Medium-Term Strategic Plan* as during the project period, the case-management

 <sup>&</sup>lt;sup>21</sup> The interview showed that the AO method was not well discussed or emphasized compared to other methodologies in the process of drafting the *Medium-Term Strategic Plan*.
 <sup>22</sup> It was emphatically pointed out that the AO method is superior to others in expeditiousness

<sup>&</sup>lt;sup>22</sup> It was emphatically pointed out that the AO method is superior to others in expeditiousness and accuracy. It was also stated that although RDTs also enable rapid diagnosis, there is a necessity to combine both methodologies in an appropriate manner, such as the use of AO for the secondary, detailed examination based on an initial test by RDTs.

unit is one of the two major strategic units; the environmental-management team is under the other unit, for malaria prevention.

Several ways exist to expand the project's approach to nursing care. For example, training material was revised once, after the project, from the viewpoint of medication and decision-making procedures, mainly by NMCP in collaboration with the training division of MOHSW and relevant players. Furthermore, the training itself has been incorporated in the programs of training agencies under the MOHSW administration.<sup>23</sup> The cascade approach, with consideration of the hierarchical health-administration system of the country, has contributed to securing the institutional sustainability of this training package.

The most serious problem for sustainability of the Laboratory Diagnosis Component is the fact that the procurement system for AO consumables and spare parts has not been established. It is true that in general and principle, basic healthcare services such as malaria control should be delivered with public funds, but it has also been recognized that the market distribution of microscopes and related products should have been addressed, since the project had intended to facilitate the AO method before the GoT substantially committed to adopt it. In Tanzania, the Medical Store Department (MSD)<sup>24</sup> has been in charge of securing stocks of consumables and spare parts for medical and healthcare equipment, and had been persuaded to stock these components for AO microscopes. However, for several reasons, such as the fact that the market for AO microscopes in Tanzania has been small and the current NMCP Medium-Term Strategic Plan has not put a priority on it, and also that MSD has been required to operate on a self-sustaining basis, it seems to have lacked any continuous incentive to stock AO-related products. Another challenge is how to allocate proper human resources to zonal repair centers to provide sufficient repair capacity for microscopes. Additionally, it is considered that the training system is not sufficient, as several cases has been reported in which the knowledge acquired by laboratory technicians through project training was not transferred to other staff members when the technicians moved, retired, or left for education.<sup>25</sup>

As for environmental management in Dar es Salaam city, although it is necessary to achieve proper maintenance and renovation of rivers into which malaria drains flow, clean

<sup>&</sup>lt;sup>23</sup> According to the interview and questionnaire survey in the ex-post evaluation, the targeted districts/municipalities have made different levels of progress in implementation of training. Of 17 targeted districts/municipalities, 1/3 have implemented the training at an adequate frequency (once every one to two years), another 1/3 have implemented training but not enough, and the last 1/3 have not implemented training at all. For other areas than those covered by the project, the training is being provided under the US President's Malaria Initiative (PMI).

<sup>&</sup>lt;sup>24</sup> A department formally under MOHSW but operated independently, in charge of procurement, stock, and distribution of medical supplies, equipment, and consumables.

<sup>&</sup>lt;sup>5</sup> According to the interviews and questionnaire survey conducted in the ex-post evaluation.

drains with heavy machines, and establish a waste-management system, the collaboration process between ministries and departments in charge of these efforts has not been fully established. This lack has become an impediment to community-based environment management, and thus it is not clear that the community-based system for environmental management that the project developed remains effective at the present time.

#### 3.4.3 Technical Aspects of the Implementing Agency

An appropriate technical level is maintained regarding nursing-care training. NMCP officials and relevant players have renewed by themselves training contents along with the advancement of methodologies and medicines. Thus, it is highly likely that they will maintain technical self-sustainability. The approach in which training materials developed by the project were incorporated into a series of GoT publications has also contributed to enhancing the situation with regard to maintaining relevant technologies within governmental operations.

As for AO diagnosis, it has a technical problem as well. It is highly likely that the necessary knowledge and skills, in terms of diagnosis and of maintenance and repair of microscopes, will not be shared properly when AO microscopes become viewed as something that should be utilized, because enough trainers will not exist and a training/diagnosis/repair system will not have been established, as mentioned earlier. The NMCP interviews revealed that the capacities of peripheral health facilities for deciding which diagnosis method to adopt according to the situation are not sufficient. NMCP guidelines still recommend microscopic diagnosis for patients who need detailed examination, while considering RDTs the basic diagnosis methodology for malaria. Lack of capacity at the field level is a major challenge for proper use of AO diagnosis in peripheral healthcare settings.

Environmental management is considered sustainable in its technical aspects. It was confirmed through this evaluation that the Dar es Salaam city council stores in an appropriate manner project deliverables such as the best practice document and pamphlets for information, education, and communication for community residents. The officials affirmed that these deliverables are always ready for reprint and distribution. For facilitation activities aiming to establish a community-based system for environmental management, these activities have usually been implemented by local counterpart organizations/individuals during the project implementation period; they are the main repository of techniques for further expansion of these activities. However, systems for integrated and effective utilization of these techniques, such as training systems, are not functioning at the present time.

#### 3.4.4 Financial Aspects of the Implementing Agency

Nursing care faces a financial gap between planned budget for NMCP training implementation and actual GoT funding. However, this situation is normal for malaria control in Tanzania, and it has become routine to implement programmes with external funds from GFATM and other donors.

This trend, however, has become stronger recently. According to a report on financial gaps that the GoT developed in 2009 as part of a GFATM grant proposal, the annual budget of US\$5.2 million for malaria control in the fiscal year 2006–2007 decreased to \$2.8 million the next year and then \$2 million in 2008–2009. At the same time, GFATM provided the GoT with \$52.5 million for RDTs and ACT from 2008 to 2013, \$59.8 million for voucher awareness-raising for pregnant women from 2008 to 2011, \$113.3 million for long-lasting insecticidal nets (LLINs) and monitoring- and evaluation-capacity development from 2009 to 2014, and \$173.6 million for ACT and home-based management of malaria.<sup>26</sup>

It is forecasted that the malaria-control programme in Tanzania can be fully implemented with donor funds including those from GFATM, characteristically with a tendency to focus on areas on which GFATM puts a focus in terms of policy and technological support.

According to the NMCP interviews, a proposal to GFATM for financing nationwide expansion of the nursing-care training based on the model developed by the project has been submitted and is expected to be approved.

The problems in the situation of laboratory diagnosis and environmental management, as mentioned earlier, are that it is a lower policy priority and that there is insufficient coordination between ministries and departments; therefore, the financial aspect of its sustainability is also inadequately supported.

#### 3.4.5 Continuity of Effectiveness/Impact

As discussed above, while the effectiveness of the Nursing Care Component is expected to be sustainable, the Laboratory Diagnosis Component has faced complicated problems and there is a concern that its effectiveness would fade away if the situation remains as it stands.

At the same time, however, given that one of the reasons for the lack of procurement

<sup>&</sup>lt;sup>26</sup> This information on budget and funds is based on the US PMI Malaria Operational Plan 2011.

systems and circumstances for AO products has been the small market for them in Tanzania, the possibility might be suggested that if the market expands on a commercial basis, which would mainly be among private medical facilities, the AO method would spread more widely. According to the local experts interviewed, due to the method's effectiveness, expeditiousness, and accuracy, when an AO microscope that is durable, simple, and affordable enough to suit the circumstances of Tanzania is introduced, it seems likely that it will be distributed among private hospitals.<sup>27</sup> It is true that a careful feasibility study must be conducted beforehand, but it is expected that future efforts will be made by broader stakeholders, including those from the Japanese private sector, to realize this possibility, which is achievable with only small innovations.

The effectiveness of the Environmental-Management Component has not been sustained. Although there is a chance for organized community resources make it effective again in cases where the necessary conditions, such as improvement of rivers and drains and establishment of waste-management systems, are satisfied, it cannot be securely sustained in the long term without continuous coordination and an adequate budget.

To sum up the above discussion, although the effectiveness of the Nursing Care Component is highly sustainable with few financial concerns, for the other two components some problems have been observed in the aspects of policy background, institutional and operation, technology, and finance, and therefore the sustainability of the project effects in general is fair.<sup>28</sup>

<sup>&</sup>lt;sup>27</sup> According to the interviews with the officials in charge of laboratory diagnosis in MOHSW and NMCP, because the demand for introduction of the AO method had been recognized during the project-design phase and the advantages of this method in terms of expeditiousness and accuracy will contribute to improvement of the operational efficiency and reputation of a hospital, it is expected that the need from the management perspective of hospitals will be large. The officials also expressed the opinion that the major reasons for the lack of use of the AO method among private medical facilities are: cost and failure-proneness of the microscopes (due to unstable power supply); unpredictable availability of spare parts and consumables for the microscopes; and lack of institutional procedures for AO training.

<sup>&</sup>lt;sup>28</sup> JICA guidelines for ex-post evaluation do not provide a quantitative standard for sustainability but instead provide rough definitions of each rating: ②, "fair," is appropriate for the conclusion that some problems have been observed in policy background or structural, technical, or financial conditions in the executing agency; and ①, "low," when major problems have been observed. The evaluator concludes that while the sustainability of the effectiveness of the Laboratory Diagnosis and Environmental-Management Components is low, that of the Nursing Care Component is expected to be sufficiently high, and thus the overall project is considered to have partly succeeded in securing the sustainability of its effects.

#### 4.1 Conclusion

This project was consistent with Tanzania's policies in the health sector and specifically in malaria control, and matched the country's development needs and Japan's ODA policy. Thus, it is highly relevant. Although the Nursing Care Component came close to fully achieving its planned target, the Laboratory Diagnosis and Environmental-Management Components did not adequately achieve their planned targets. As for the achievement of the Overall Goal, although it is not possible to measure how the target values were met and to what extent the project contributed to them, the Nursing Care Component is presumed to have contributed somewhat to the Goal, and the others only to a limited extent. Hence, the effectiveness of the project is fair. While the project period of cooperation was within the plan, elements of inputs were partially inappropriate and the project cost exceeded the plan; therefore the efficiency of the project is fair. The effectiveness of the Nursing Care Component has achieved high sustainability with little concern about the financial aspects. However, in the Laboratory Diagnosis and Environmental-Management Components, some problems have been observed in the aspects of policy background, institutional and operation, technology, and finance, and therefore the sustainability of the project effects in general is fair.

In light of the above, this project is evaluated as partially satisfactory.

#### 4.2 Recommendations

#### 4.2.1 Recommendations to the Executing Agency

#### 4.2.1.1 Nursing Care Component

Although an appropriate organizational structure and technical level for expanding training courses have been secured, progress on implementation of training varies by area. For example, some districts/municipalities have periodically implemented training, while others have achieved only insufficient implementation compared to annual intake. It is desirable to secure the continued provision of an adequate budget at national and district/municipal levels to spread the training across the country by leveraging the achievements of the project.

#### 4.2.1.2 Laboratory Diagnosis Component

1) To approach MSD regarding the establishment of a procurement system for AO consumables and spare parts

One of the major problems for this component is the lack of a stable procurement system for AO consumables and spare parts. Further negotiation with MSD is desired. In addition, it is expected that the introduction of AO microscopes to private hospitals will contribute indirectly to addressing this problem. Thus, it is desirable to seek to identify activities that the government can implement, such as conducting an AO-method dissemination seminar in which experts from the private sector can participate, to expand use of AO microscopes.

2) To provide thorough monitoring and supervision to health facilities to help achieve appropriate decisions in selecting diagnosis methodology.

At the health-facility level, the method for diagnosis of malaria has often not been selected in an appropriate manner. It is recommended that thorough monitoring and supervision of health facilities be continually provided in order to materialize the strategic role of microscopic diagnosis, a use that can be properly combined with RDTs, at a field level.

3) To properly maintain and store the AO microscopes in preparation for a future revival.

As described above, the reasons AO microscopes have not been utilized at a field level will not be easily addressed. However, the AO microscope still remains effective and necessary for malaria control, and will be a useful asset once conditions become right. It is desirable to ensure that in preparation for the future revival of use of AO microscopes, health facilities properly maintain and store the provided AO microscopes even if they are currently out of use.

#### 4.2.1.3 Environmental-Management Component

Prerequisite conditions to sustain the effects of this component include proper maintenance and renovation of rivers into which malaria drains flow, cleaning of drains with heavy machines, and establishment of a waste-management system. As mentioned earlier, current circumstances do not satisfy these conditions, and limit the effect and sustainability of the project. It is recommended that efforts be continually made to realize good inter-ministerial and inter-departmental coordination between the public-health and civil-engineering areas on this issue.

#### 4.2.2 Recommendations to JICA

#### 4.2.2.1 Nursing Care Component

The malaria control effort in Tanzania is significantly affected by GFATM, both technically and financially. Some NMCP officials and laboratory technicians recognize the value of AO diagnosis and have a desire to expand it. However, this desire is not expected to be fulfilled unless the method is better focused by GFATM. Since GFATM formulates policy in accordance with WHO recommendations, it is recommended to the Japanese officials lobbying WHO to recognize the value and necessity of the AO method of malaria diagnosis.

#### 4.3 Lessons Learned

4.3.1 Setting and Management of Project Indicators with Consideration of Monitoring and Evaluation

The indicators for the outputs and objectives of the project identified on the PDM were not practically suitable for monitoring and evaluation. In addition, baselines were not collected for them and targets were not set properly. In consequence, the project was neither managed nor monitored quantitatively, and this ex-post evaluation also had limitations in this regard.

This situation called attention to the necessity of selecting monitorable indicators, collecting baselines, and setting target values. Additionally, it is desirable to continue data collection and management during the project-implementation period by incorporating these actions into ordinary project activities. In a case where counterpart agencies already have or are developing capacity for monitoring and evaluation, the involvement of the relevant departments of those counterpart agencies in the design, management, and evaluation phases of the project would likely improve the appropriateness of the indicators and the quality of monitoring and evaluation.

## 4.3.2 Effectiveness of the Hierarchical System and Holistic Package of Training in Light of the Partner Country's Administrative Structure.

The Nursing Care Component of this project can be rated high in terms of effectiveness and sustainability. This component was successful in encouraging initiative on the Tanzanian side, as it adopted a hierarchical training system called a cascade approach that was well suited to Tanzania's administrative structure in the health sector.

In order to make this system run and maintain session quality during implementation, the project consolidated training materials and protocols: the training package containing a comprehensive curriculum including monitoring activities as well as a standard budget model for reference in planning budget at a district level; "low-tech" tools among the training materials; involvement of local human resources with the aim of developing user-friendly materials; and the training materials being adopted as official MOHSW documents. These various efforts are also considered to have contributed to the achievement of the project and the sustainability of its effects.

The efforts and ideas discussed above, as well as the whole system and package including the processes of development and dissemination of materials, can be seen as a case of best practice widely applicable beyond a single issue such as training on nursing care of malaria.

#### 4.3.3 Consideration of Market and Maintainability

Establishment of systems for the repair of AO microscopes and procurement of spare parts and consumables were major challenges for the project. Although in general and in principle, basic healthcare services such as malaria control should be delivered with public funds, the project had intended to facilitate the AO method before the GoT substantially committed to adopt the method. The result shows that the procurement of equipment, spare parts, and consumables would possibly be an issue in introducing new technologies and products under these conditions of a lack in local markets.

During the project-design phase, the Japanese side had the expectation that it would be possible to secure a stock of relevant products by means of steady efforts in negotiating with MSD, and also that it would be feasible to establish a system for microscope maintenance as the project helped the improvement of the organizational and individual capacity of the refinement centers. This expectation regarding procurement would only have been realized if the project succeeded in making MSD and private dealers give priority to securing stocks of AO spare parts and consumables, which is not a natural business operation under market principles. The other expectation regarding the establishment of a maintenance system was also not so easy to realize—it seems to have required institutionalization of training in repairing the technology and enough volume of demand in society to cause this technology's autonomic spread and sustainability. It had been also expected that the AO method would gain policy backup. None of these expectations have been realized so far. It can be pointed out that the project started and was in fact designed, in this difficult situation.

In any cooperation project intending to introduce a new product or service under a condition where sufficient commitment and support from the partner government are not yet promised, it must be carefully determined if there is a market that can sustain the distribution of relevant products and services and if the targeted society has sufficient capacity for their sustainable maintenance.