

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE EXPANSION OF TUBERCULOSIS
CONTROL IN THE SOUTHERN AND EASTERN GOVERNORATES
OF
THE REPUBLIC OF YEMEN

NOVEMBER, 2000

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
KUME SEKKEI CO., LTD.
INTERNATIONAL TECHNO CENTER CO., LTD.

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PREFACE

In response to a request from the Government of the Republic of Yemen, the Government of Japan decided to conduct a basic design study on the Project for Expansion of Tuberculosis Control in the Southern and Eastern Governorates of the Republic of Yemen and the Japan International Cooperation Agency (JICA) sent to Yemen a study team from April 15 to May 19, 2000.

The team held discussions with the officials concerned of the Government of Yemen, and conducted a field study at the study area. After the team returned to Japan, further studies were made and as this result, the Basic Design Study Report was finalized.

The Exchange of Notes was signed between the both governments on November 14, 2000. However, the consultants were unable to enter the country of Yemen for a prolonged period, the Project as an undertaking for fiscal year 2000 became impossible due to the fact that risk level 3 (travel postponement advisory). Therefore, the Ministry of Foreign Affairs decided to temporarily suspended the Project proceedings in 2000.

Upon relieving to red-signal level 2 on November 2001, the Project was recommended as an undertaking for fiscal 2002. JICA sent to Yemen an implementation review study team from March 1 to March 9, 2002 to designed to survey any changes in conditions since the basic design and to re-estimate the Project cost.

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 Yemen for their close cooperation extended to the teams.

March, 2002

Takao Kawakami
President
Japan International Cooperation Agency

March, 2002

Letter of Transmittal

We are pleased to submit to you the implementation review study report on the Project for Expansion of Tuberculosis Control in the Southern and Eastern Governorates of the Republic of Yemen.

This study was conducted by Kume Sekkei Co., Ltd., and International Techno Center Co., Ltd. Consortium, under a contract to JICA, during the period from March 1 to March 9, 2002. In conducting the study, we have examined the feasibility and rational of the project with due consideration to the present situation of Yemen and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

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

Very truly yours,

Tetsuro Nishimura
Project Manager,
Implementation Review Study Team on
The Project for Expansion of Tuberculosis Control in
the Southern and Eastern Governorates of the Republic of Yemen
Kume Sekkei Co., Ltd. - International Techno Center Co., Ltd.
Consortium

□ Map of Yemen



□ Map of Aden: Location of Site and Related Health Facilities



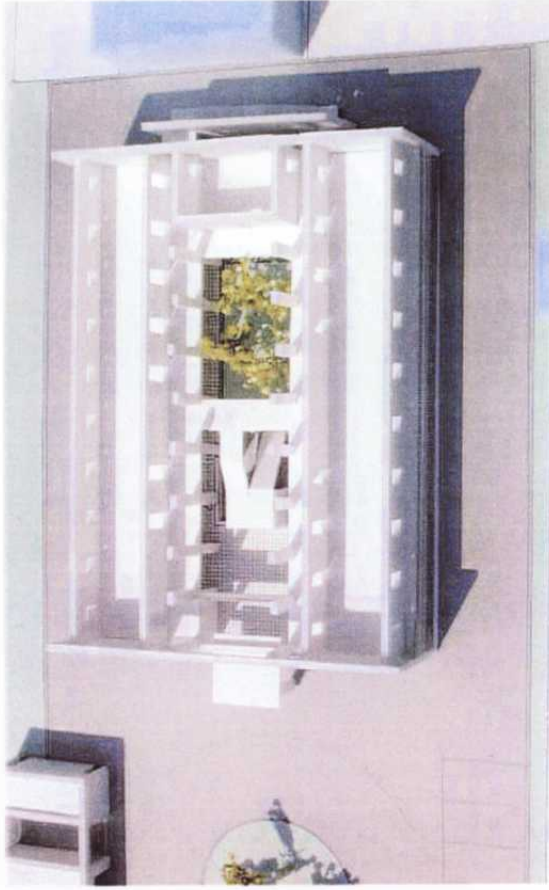
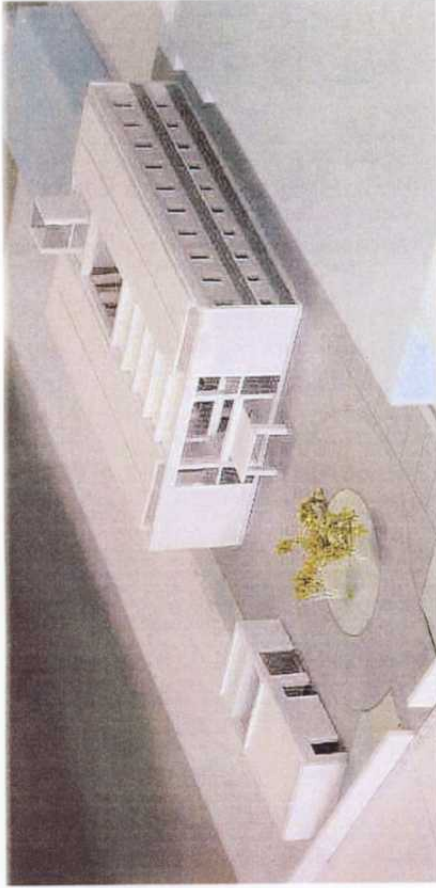
NOTES: ● : Polyclinic ● : Health Unit ★ : Primary Health Care Office
 ● : Hospital □ : Related Office



THE PROJECT FOR THE EXPANSION OF TUBERCULOSIS CONTROL IN THE SOUTHERN AND EASTERN GOVERNORATES OF THE REPUBLIC OF YEMEN



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The Project for Expansion of Tuberculosis Control in the Southern and Eastern Governorates of the Republic of Yemen

Abbreviations

ATCC	Aden Tuberculosis Control Center
AV	Audio Visual
BOD	Biochemical Oxygen Demand
CB	Concrete Block
CMS	Central Medical Supply
COD	Chemical Oxygen Demand
DOTS	Directly Observed Treatment, Short Course
DTC	District Tuberculosis Coordinator
E/N	Exchange of Notes
GTC	Governorate Tuberculosis Coordinator
HC	Health Center
HTC	Hodeida Tuberculosis Center
HU	Health Unit
LNG	Liquid Natural Gas
MDF	Main Distribution Frame
MLT	Medical Laboratory Technician
MOPD	Ministry of Planning and Development
MOPH	Ministry of Public Health
NTI	National Tuberculosis Center
NTP	National Tuberculosis Control Programm
PABX	Private Automatic Branch Exchange
PC	Poly clinic
PC	Precast Concrete
PHC	Primary Health Care
PTTC	Project Type Technical Cooperation
RC	Reinforced Concrete
TB	Tuberculosis
TTC	Taiz Tuberculosis Centrer
WB	World Bank
WFP	World Food Program
WHO	World Health Organization
YATA	Yemen Anti-Tuberculosis Association
YR	Yemen Rial

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1. Member List of the Survey Team

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3. List of Party Concerned in the Recipient Country

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CHAPTER 1 BACKGROUND OF THE PROJECT

1.1 Background of the Request

The Republic of Yemen (hereinafter referred to as “Yemen”) was born in May, 1990 through the unification of South Yemen and North Yemen. The unstable political and economic conditions, however, persisted even after unification. Despite increased oil production, all productive activities other than oil remained sluggish and such problems as an expanding fiscal imbalance and accelerating inflation increased the foreign debt to an unsustainable level. Coupled with a high population growth rate of approximately 3%, the country’s development was stalled. The civil war which started in May, 1994 ended in July and Yemen made a fresh start with the New Constitution which was promulgated in October.

For post-unification socioeconomic development, a development plan consisting of readjustment of the macroeconomy and structural readjustment programmes, assisted by the World Bank and the IMF, was announced in 1995 after the end of the civil war. In addition, the First Five Year (National Development) Plan was formulated to supplement these programmes. At the initial stage of the implementation of this National Development Plan, the level of the current fiscal deficit temporarily dropped and the annual rate of inflation stabilised due to increased revenue from oil exports. The rapid fall of the oil price since 1997, however, has made the management of the macroeconomy difficult, resulting in an increased balance of foreign debt again. Even though the Government of Yemen has tried to deal with the situation by reducing subsidies and development expenditure, etc., the fiscal deficit reached some 6% of the GNP in 1998 with an average annual rate of inflation of 11%, causing fresh fiscal management difficulties. Many problems still remain unsolved today and the situation is making Yemen rely on the assistance of the international community. Since September, 1996, Yemen has been designated as a country for which debt reduction measures are applicable by the Government of Japan.

(1) Situation of Health Sector in Yemen

The Government of Yemen has adopted “the expansion and improvement of educational and public health services to meet the increasing demand” as a major socioeconomic development objective of its First Five Year Plan (FFYP) 1996 - 2000. The concrete development targets in the health sector are improved health and medical care services (29 projects relating to mother and child health, malnutrition, malaria/TB/schistosome, the environment and health at work, etc.) and the establishment of medical facilities (facilities of 674 PHC units, 168 health centres and 34 district hospitals, etc.) Meanwhile, the Five Year Health Development Plan based on this FFYP adopts the following development strategy to achieve such objectives as improved public health in urban (particularly slum) and rural areas, rectification of the regional gap in access to health facilities and strengthening of the

PHC network (improved mother and child health, infectious diseases control measures, improved nutrition, supply of safe water and health education).

Table 1-1 Development Strategy for Health Sector

Objective	Description
Improved Mother and Child Health (MCH)	Substantial lowering of the contraction and outbreak rates of infectious and parasitic diseases which severely affect infants and mothers
Improved Nutrition	Improvement of the state of nutrition among the public in general and the socially weak in particular
Improved PHCs	Qualitative improvement of PHCs to substantially reduce the risk for mothers and children posed by pregnancy and childbirth among young girls and repeated childbirth at short intervals
Development of Diagnostic and Treatment Facilities	Development and improvement of diagnostic and treatment facilities, including those for emergency medical services (EMSs), to improve measures to deal with damage and impediments caused by the continuation of unhealthy conditions
Collaboration with Other Sectors	Improvement of negative environmental factors which expand the disease in collaboration with other sectors

As in the case of many other developing countries, the health sector is characterised by the common occurrence of preventable infectious diseases and diarrhoea among infants, etc. and the general level of nutrition among the public is low. There is a shortage of such medical staff as doctors and nurses and a shortage of facilities and it cannot be said that the health and medical care service system is functioning well. Moreover, the qualitative aspects of medical facilities and staff are also insufficient.

The HDI (Human Development Index) announced by the UNDP in 1998 puts most Middle Eastern and North African countries, including the United Arab Emirates, in the middle ranking between 65th and 130th. Only Yemen and Sudan were ranked below 130th.

Table 3 compares the health and medical care indices for Yemen with five low ranking Arab countries (Jordan, Egypt, Morocco, Iraq and Sudan) and the two neighbouring countries of Saudi Arabia and Oman. The rates of completed preventive vaccinations among one year olds against measles and TB show that while most countries maintain approximately 90% for both diseases, the figures for Yemen are as low as 59% for TB and 51% for measles. Even though the rate of TB patients appears to be high in Iraq, Morocco and Yemen compared to the other five countries shown in this table, some countries lack information on the rate of malaria patients and others. In the case of Jordan and Oman, the rate of TB patients does not appear to be accurate. In short, the general situation is inferred to be that the national statistics on these very important resurgent infectious diseases are not totally reliable because of the absence of rigorous diagnostic work.

Table 1-2 Health and Medical Care Indices for Yemen and Nearby Countries

	Saudi Arabia	Oman	Jordan	Egypt	Morocco	Iraq	Yemen	Sudan
HDI Ranking	70	71	87	112	125	127	151	157
Public Health - Ratio in GNP (%)	0.6		0.6	0.6	1.0	1.0		1.0
Expenditure - Ratio in GDP (%)	3.1		1.8	1.0	0.9		1.5	0.5
Calory Intake/person/day (kcal)	2,736		2,726	3,315	3,140	2,266	2,013	2,310
Infant Mortality Rate (IMR): in every 1,000	25	15	21	57	64	94	78	73
Under 5 Mortality Rate (U5MR): in every 1,000	30	18	25	78	74	122	105	
ORT Use Rate (%)	58	85	41	95	29		92	
Maternity Mortality Rate (MMR) in every 100,000 childbirths	130	190	150	170	610	310	1,400	
Average Life Expectancy at Birth (years)	70.7	70.3	68.9	64.8	65.7	58.5	56.7	52.2
Rate of Under 5 Under-Weight Children (%)	-	23.0	9.0	15.0	9.0	12.0	39.0	34.0
Preventive Vaccination - TB (%)	91	96		91	96	99	59	96
Rate for One Year Olds - Measles (%)	92	98	98	85	93	97	51	75
TB Patients: in every 100,000		10.2	9.4	37.8	112.5	134.1	96	41.5
Malaria Patients: in every 100,000	56	341			1	500	260	
Doctors: in every 100,000	166	120	158	202	34	51	26	10
Nurses: in every 100,000	348	290	224	222	94	64	51	70

Notes:

1. HDI: development index centering on human aspects, calculated using the average life expectancy, education and GDP of each country
2. ORT: treatment to orally supply saline solution to infants suffering from dehydration due to diarrhoea and others

Source: UNDP Human Development Report 1998 (covering 175 countries)

(2) TB Control Measures in Yemen

TB control measures were first introduced in Yemen in the 1970's and the Ministry of Health upheld TB control as the most important issue for public health and medical care in its Second Five Year Health Plan which commenced in 1982. At the same time, a request was made to the Government of Japan for the provision of technical cooperation and the JICA commenced the TB Control Project (I), project-type technical cooperation, in 1983. TB control activities at the National Tuberculosis Institute (NTI) and TB Sub-Centres in Taiz and Hodeidah, all of which were

constructed with Japanese grant aid in 1985 and 1986, have been continually supported by fresh project-type technical cooperation (Phase II) which commenced in 1993.

Prior to the commencement of the TB Control Project in 1983, no concrete TB control measures had been implemented in Yemen. The registered number of new TB patients in 1980 was as high as 27,000 or 336 in every 100,000 (WHO data for 1999). In January, 1990, the NTP was set up in the Ministry of Health, marking the start of full-scale control activities separately from those of the NTI. A GTC (Governorate Tuberculosis Coordinator) was appointed for each governorate to start to establish a nationwide system for TB control. Unification in the same year made it necessary to extend the activities of the NTP Office to former South Yemen and the subject area and population of such services were increased by three times and one and a half times respectively. The DOTS Strategy was introduced with the assistance of the WHO in 1996, further accelerating the extension of the National Tuberculosis Control Programme (NTP) nationwide. In 1997, the number of newly registered TB patients totalled 12,013 or 74 in every 100,000 (WHO data for 1999).

Under the NTP, TB control activities have been in progress to achieve two targets proposed by the WHO: (1) curing of 85% of patients declared positive by sputum smear examination and (2) discovery of 70% of undiscovered patients. Particular emphasis has been placed on the nationwide expansion of the DOTS Strategy (discovery of patients by sputum smear examination and treatment with anti-TB drugs under direct observation). To be more precise, the appointment of a GTC for each of the country's 20 governorates is planned in addition to the deployment of one district tuberculosis coordinator, one doctor, one MLT (medical laboratory technician) and two public health workers in each of 226 districts (said to have increased to approximately 300 by now).

The TB Control Project (III) in Yemen, project-type technical cooperation which is currently in progress, is expanding the area of application of the DOTS Strategy to southern Yemen using the facilities established under the NTP. In March, 1993, the JICA dispatched a preliminary study team to Yemen and the report of this study team stated that while the NTP had made remarkable progress with great efforts by the Government of Yemen, in turn assisted by the WHO and other international aid organizations, the following problems still existed.

1) Need for Extension of NTP

The extension of the NTP has reached only some facilities and major cities for the effective implementation of TB control measures. There is a tendency for patients to concentrate on specific facilities as the examination network has not yet been fully extended. Extension of the NTP to rural areas and re-arrangement of the patient referral system in urban areas are particularly required.

2) Need for Qualitative Improvement

The cure ratio of patients having undergone the DOTS is 75%, failing to achieve the target 85%. The ratio of patients recording a negative smear examination 2 - 3 months after the commencement of treatment is as high as more than 85%, suggesting patient drop-outs during the follow-up treatment process. This figure indicates such problem areas as patient education during the initial intensive treatment period and subsequent follow-up. The strengthening of travelling guidance and the re-education of people engaged in TB control must be conducted to improve the situation.

3) Need for Review of NTP

The definition of a TB patient and the quarterly reporting items vary depending on the NTP Manual, patient card or teaching materials (WHO modules). It is necessary to re-consider the introduction of TB basic units which consistently conduct the discovery of patients to evaluation of the treatment results, assisted by the establishment of a standards laboratory as well as a patient register. Under a large system, the patient referral system is not clear cut. Re-arrangement of the NTP Manual is, therefore, necessary to improve practical dealings with patients, training contents and training materials in addition to review of the extension strategy.

(3) Activities Under Project-Type Technical Cooperation (Phase)

Prior to the Project, project-type technical cooperation (Phase I) has been implemented in North Yemen since 1983. Following suspension due to the unification of the country and the civil war, Phase has been in progress since August, 1999.

**Table 1-3 Activities Under Project-Type Technical Cooperation (Phase):
August, 1999 - August, 2004**

-
- (1) Extension of the DOTS Strategy
 - 1) Training of health personnel implementing DOTS :
Subject persons: doctors, medical laboratory technicians and primary health workers
 - 2) Travelling guidance in areas where the DOTS is newly implemented
 - 3) Travelling guidance to improve and evaluate the TB control measures in each governorate
 - (2) Extension and qualitative improvement of the laboratory network
 - 1) Travelling guidance for laboratories
 - 2) Establishment and improvement of the accuracy control system
 - (3) Improvement of the medicine and equipment supply and distribution systems
 - (4) Improvement of the data control and evaluation system
 - (5) Extension to and improvement of the health education for local residents and patients
 - (6) Study to evaluate the scale and quality of the problem of TB in Yemen
 - (7) Holding of GTC and JCC (Joint Coordinating Committee) meetings, etc.
-

Source: Summary of the TB Control Project in Yemen (Phase), April, 2000

As described so far, the objective of the Project is to extend the NTP promoted by the Ministry of Health of the Government of Japan to the southern and eastern governorates in Yemen to qualitatively improve TB control through the establishment of the Aden Tuberculosis Control Centre and the provision of medical equipment for related health facilities in the Aden Governorate.

1.2 Contents of the Request

The request made by the Government of Yemen consisted of components to achieve the targets described in Table 1-4 based on the activities of the three existing TB control centres and the contents of the assistance provided under project-type technical cooperation. The Study Team held a series of discussions to confirm the contents of the request and to determine the appropriate scale of the Project.

Table 1-4 Outline of the Request

Higher Target	Lowering of the tuberculosis contraction and death rates in southern Yemen
Project Target	Effective management of TB control measures in southern Yemen
Expected Effect	Development of TB control centres responsible for southern Yemen
Activities and Input Plan (1) Request to Japanese Side	A. Construction of the Aden Tuberculosis Control Centre Facilities: administration rooms, training rooms, meeting room and laboratory, etc. Equipment: office equipment, laboratory equipment and vehicles, etc. B. Nine Health Facilities in Aden Equipment: X-ray equipment, ultrasonic diagnosis unit, refrigerators and air-conditioning units, etc.
(2) Work Plan for Yemeni Side	Management of the TB control programme in southern Yemen using the Aden Centre as a base
Responsible Agency	TB Control Section, Directorate General of the PHC, Ministry of Health
Subject Area	Southern and eastern governorates in Yemen
Beneficiaries	Some 2.3 million people (1996) in six governorates in the subject area

The requested total floor area for the Aden Tuberculosis Control Centre was 2,600 m² which was the same as that for the existing NTI in Sana'a. Through discussions with the Yemeni side, rooms of which the purpose of use was not clearly defined and of which the function overlapped with that of another room were eliminated while examining the necessary staffing strength for each department. In the case of equipment, streamlining of the rooms and staffing strength led to the elimination of duplicated equipment. The requested equipment was classified as office equipment and laboratory equipment as it was decided to examine the equipment to be installed under the building work or building service work as part of the relevant work items.

In regard to the nine health facilities in Aden, X-ray equipment and an ultrasonic diagnosis unit, etc. were requested for PCs (poly-clinics) which are believed to form the basic units (acting as the basic units for patient discovery and treatment with a smear examination room and a patient register, etc.) for the NTP in Yemen. The view expressed by the Yemeni side was that as the NTP is integrated to PHC activities, the strengthening of PHCs is essential for the effective implementation of the NTP. Accordingly, input to PCs will also be essential. In response, the Study Team expressed the following opinions.

- 1) The emphasis of the NTP in Yemen is placed on the discovery of positive patients by means of sputum smear examination and the provision of many (five) X-ray units could lead to misunderstanding of the basic policy of the NTP.
- 2) While the strengthening of PCs is necessary, they are basic units. From the viewpoint of TB control, sputum smear examinations should be given the highest priority at PCs.
- 3) There are few precedences in other countries for the active installation of X-ray units at basic medical facilities for TB control.
- 4) The excessive input of equipment will constitute a heavy burden for the TB control administration because of the high maintenance cost, etc.
- 5) Excessive input to PCs will result in a heavy patient flow to these PCs from other governorates and will conflict with the basic policy of the NTP.

In response to the above opinions of the Japanese side, the Yemeni side argued that at least one X-ray unit will be required in Aden for TB control. Both sides agreed that one X-ray unit will be installed at the Aden Tuberculosis Control Centre to deal with referred patients.

In regard to other types of equipment, their examination in Japan involving organizations related to Japanese ODA concluded that such equipment lacks a direct link with TB control (nationwide extension of the DOTS) and that such equipment should be dealt with under the project-type technical cooperation scheme or the grassroots grant aid scheme. Consequently, it was finally decided to drop such equipment from the scope of the present grant aid project.