No. 4

BASIC DESIGN STUDY REPORT

ON

THE MEDICAL EQUIPMENT SUPPLY PROJECT

IN

THE PEOPLE'S REPUBLIC OF BANGLADESH

MARCH 1988

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to the request of the Government of the People's Republic of Bangladesh, the Government of Japan has decided to conduct a basic design study on the Project for the Medical Equipment Supply to the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders and the Tuberculosis Control Facilities, and entrusted the study to the Japan International Cooperation Agency (JICA).

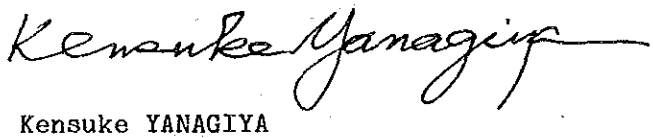
JICA sent to Bangladesh a study team headed by Dr. Sadashige KAMIYA, Director, Chiba Branch Office, Tokyo Quarantine Station, Ministry of Health and Welfare from January 14th to Feburary 5th, 1988.

The team had a series of discussions on the Project with the officials concerned of the Government of Bangladesh, conducted a field survey and collected relevant data and information. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

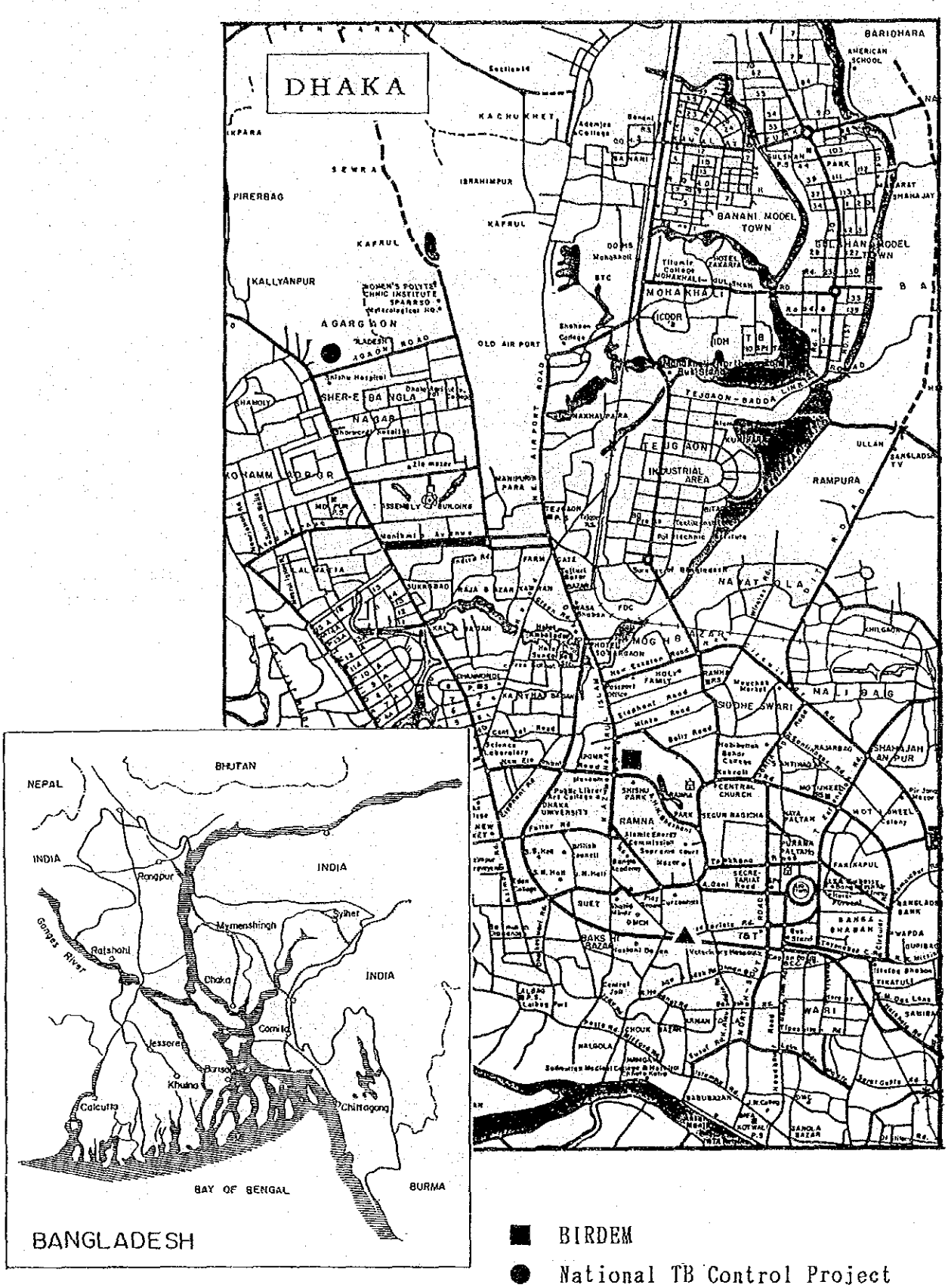
I wish to express my deep appreciation to the officials concerned of the Government of the People's Republic of Bangladesh for their close cooperation extended to the team.

March, 1988



Kensuke YANAGIYA
President
Japan International Cooperation Agency

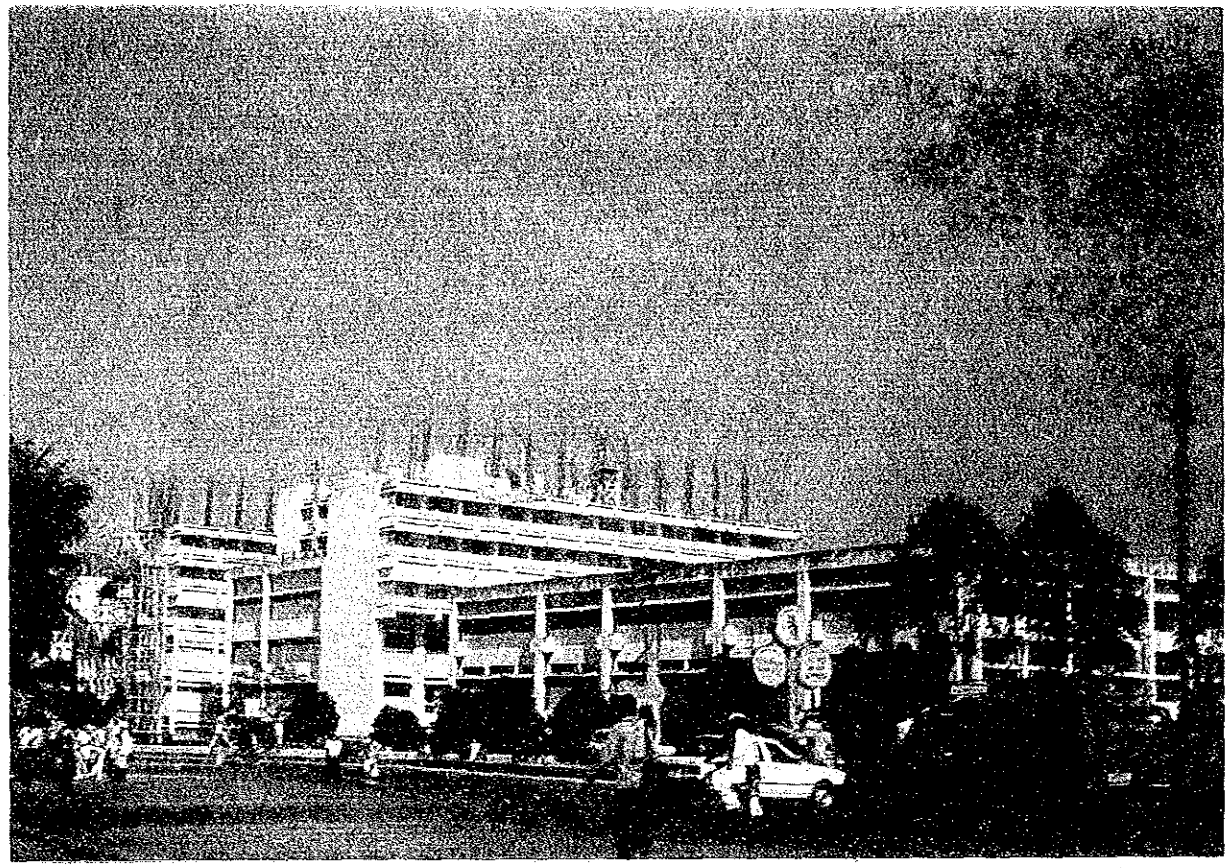
SITE MAP



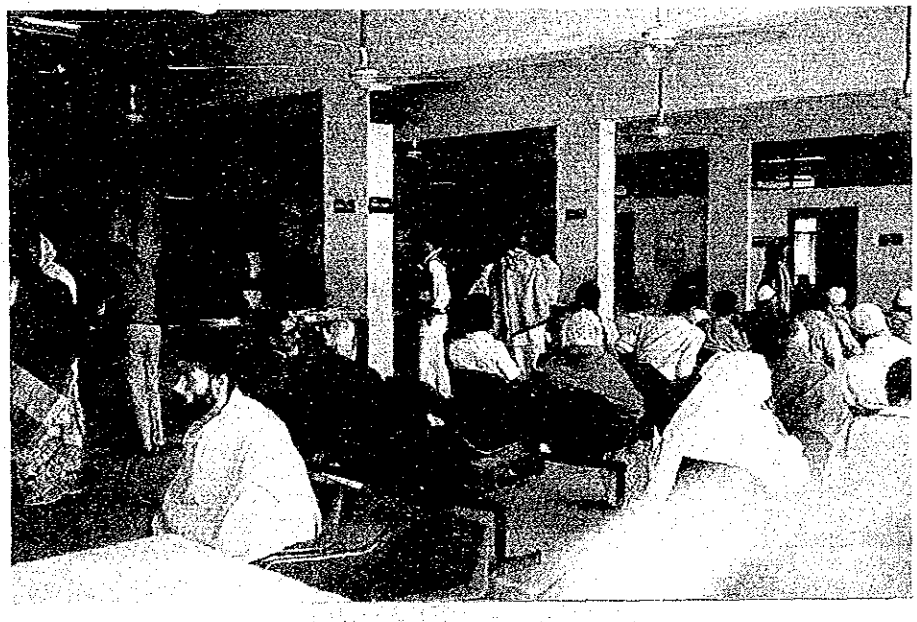
■ BIRDEM

● National TB Control Project

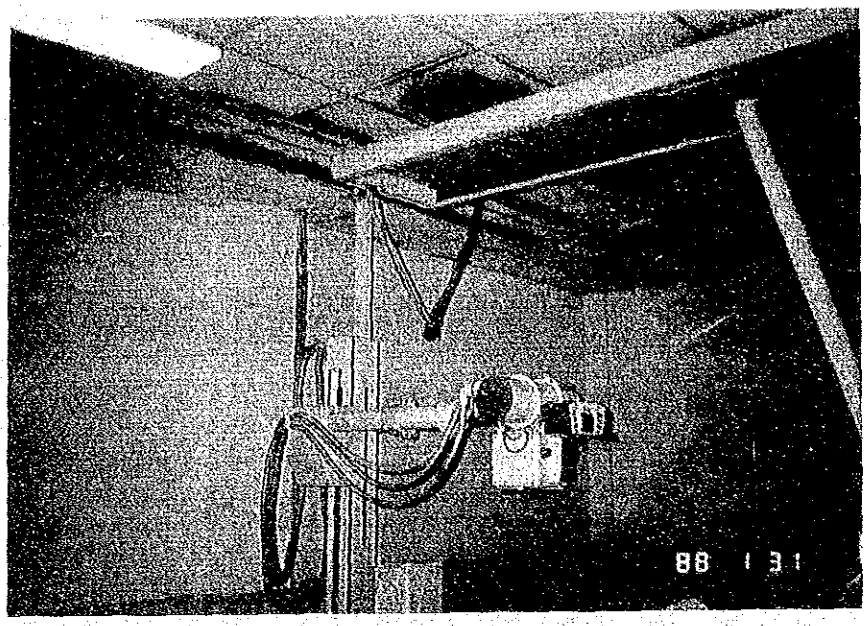
▲ TB Control and Training Institute



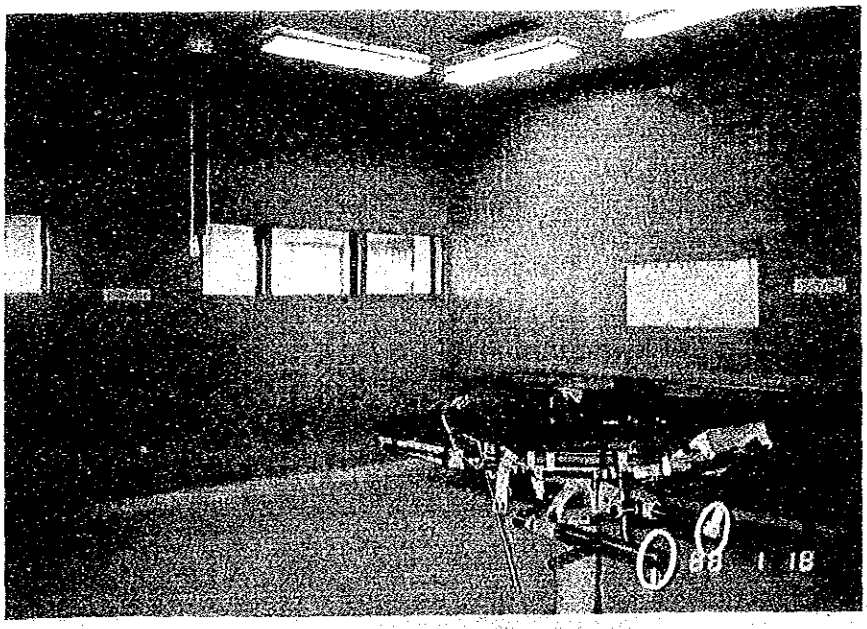
BIRDEM



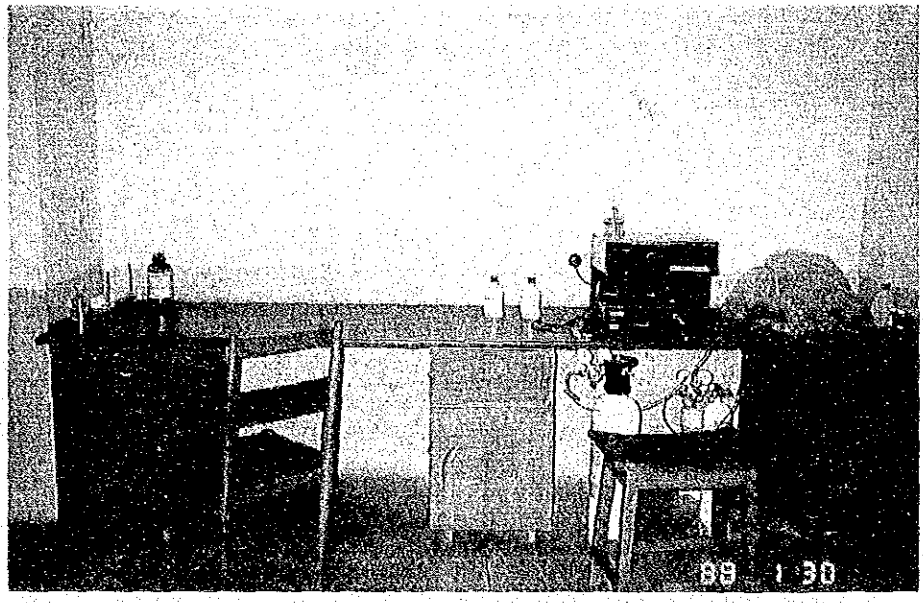
Waiting room, BIRDEM



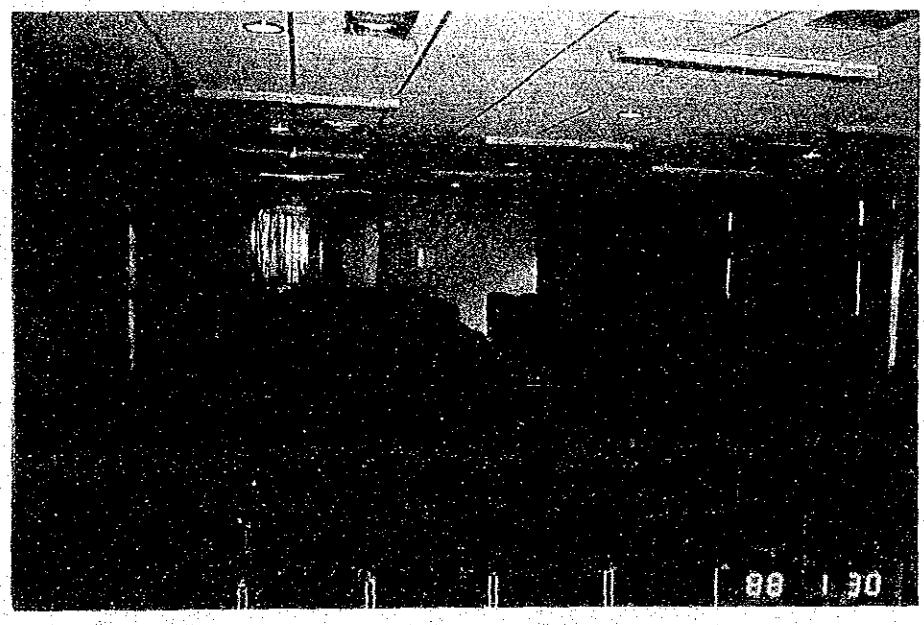
X-ray room, BIRDEM



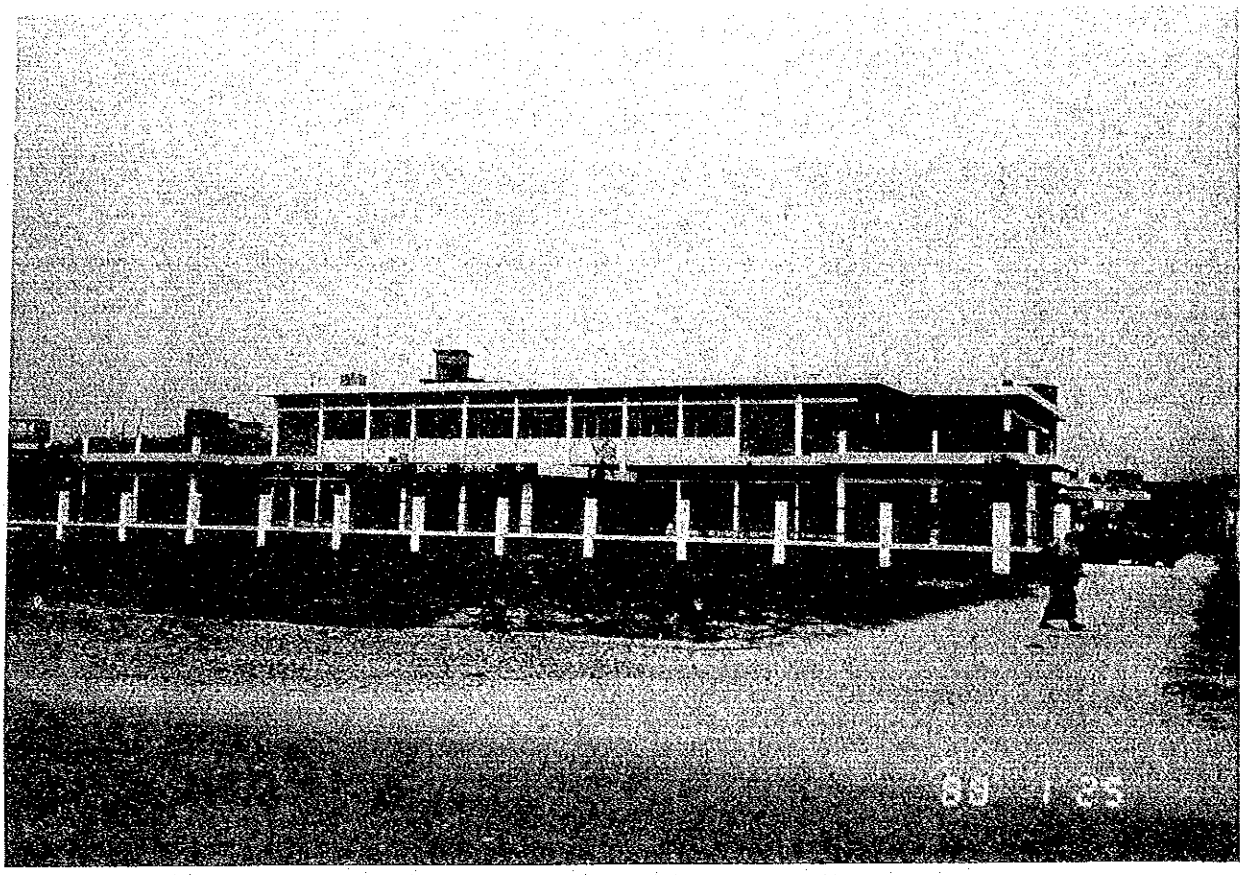
Operation room, DIRDEM



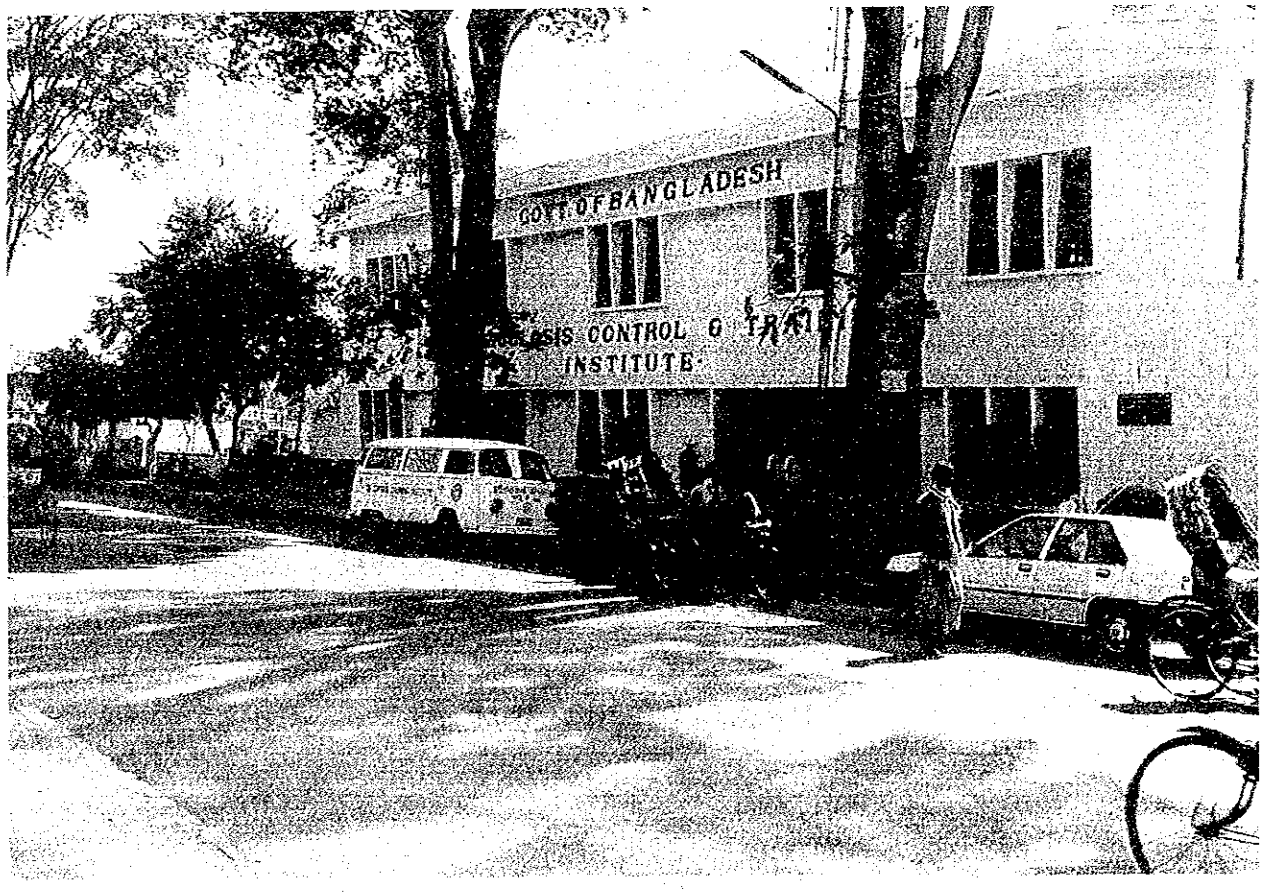
Research laboratory, BIRDEM



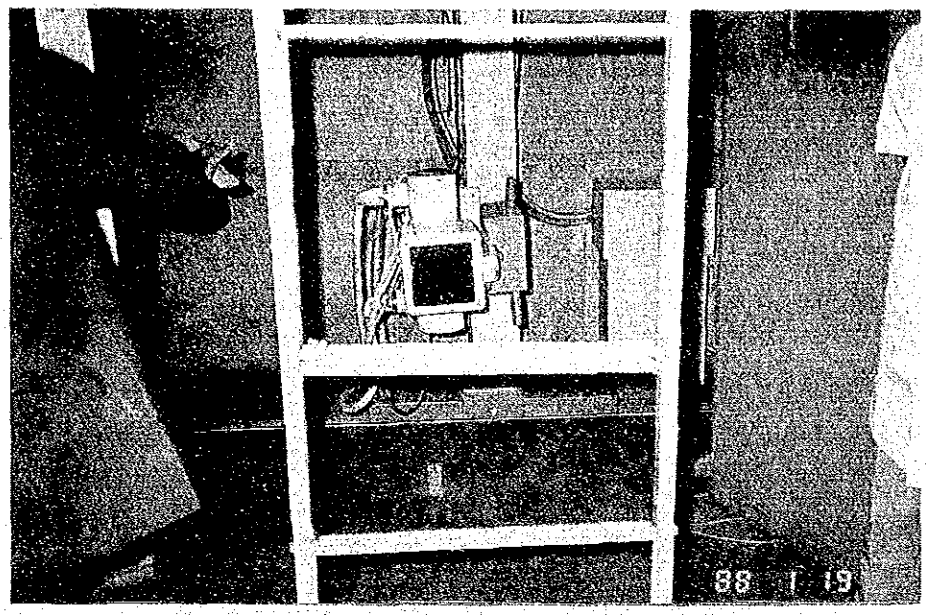
Seminar hall, BIRDEM



National TB & Leprosy Control Project



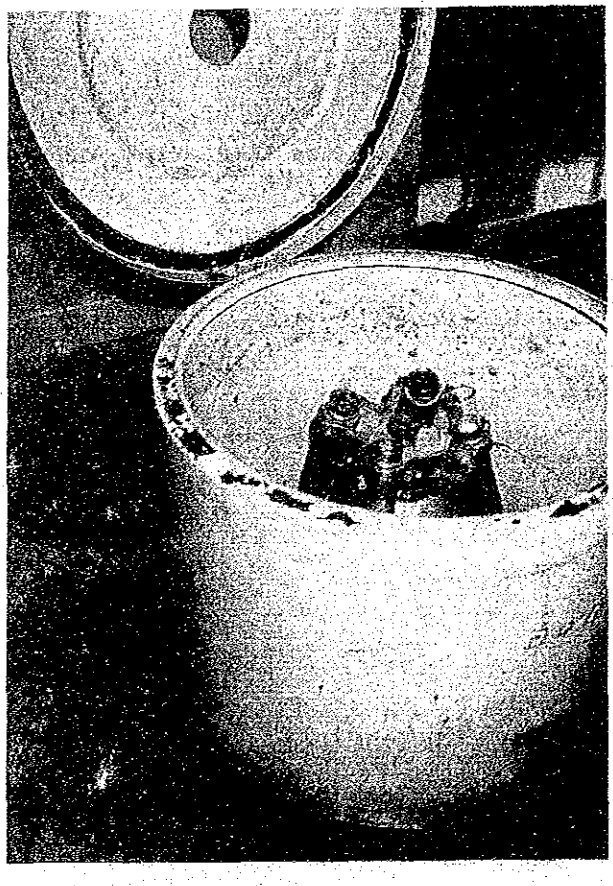
TB Control & Training Institute



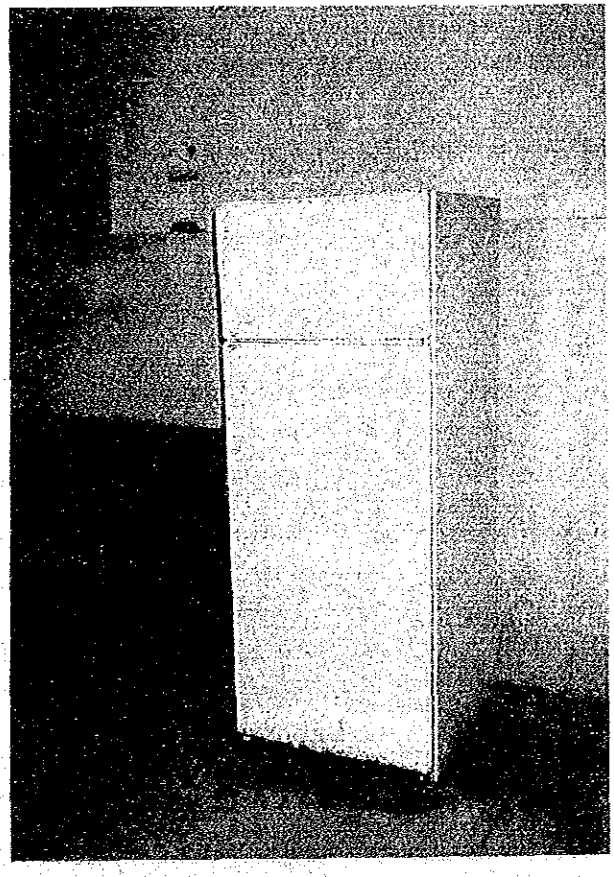
X-ray room, National TB & Leprosy Control Project

Laboratory room, TB Control & Training Institute

Incubator, TB Control & Training Institute



Centrifuge,
TB Control & Training Institute



Lab. Refrigerator,
TB Control & Training Institute

SUMMARY

The People's Republic of Bangladesh (hereinafter referred to as "Bangladesh"), which became independent in 1971, has made up consecutive five-year plans, namely, the first from 1973, the second from 1980 and the third from 1985, respectively, in order to maintain its efforts for the development of economy, upgrading of social welfare and attainment of self-sufficiency of the country.

The health care sector has also been incorporated in the annual development plans to strengthen services for the entire population. As a step for this purpose, the Government of Bangladesh has been placing emphasis on the reinforcement and training of the personnel concerned. Efforts are also being directed to the strengthening of the facilities and medical personnel in the rural area, in order to reduce morbidity and mortality of the residents under severe living conditions that compose 85 to 90 per cent of the total population.

The health services organization of Bangladesh follows the general administrative divisions of the country. Administratively, the Ministry of Health and Family Planning is responsible for policy and planning, while the Director General of Health Services of the Ministry is responsible for the implementation of all health programmes. Total numbers of medical manpower, medical facilities and inpatient beds are 76,524, 1,821 and 22,874, respectively.

Leading causes of death in 1984 of the country were stomach diseases including diarrhoeal, lung and respiratory diseases including tuberculosis, old age complications, unknown fever, asthma, jaundice, tetanus, skin diseases, child death due to prematurity and perinatal causes, worm infection, gastric ulcer, typhoid etc.

Total amount of Japanese Government's Grant Aid rendered to Bangladesh between 1979 to 1986 was Yen 6,503 million for 10 projects in

the health sector. The technical cooperation to the cardiovascular disease control projects was also rendered by the Japanese Government during the fiscal years 1979 to 1985.

International organizations such as WHO, UNICEF and UNDP as well as many countries have also been rendering assistance to the health sector of Bangladesh.

In Bangladesh, it is estimated that about 2% of adult population (about 2 million people) are suffering from tropical diabetes, endocrine and metabloic disorders. Although a small percentage of children are also affected by these diseases, most patients belong to the age group in which the productive period of life is experienced. It can be said, therefore, that these diseases cause a serious social problem as one of the elements obstructing economic development of the country. As regards tuberculosis, together with other diseases of chest and respiratory organs, it is the second most important public health problem. Tuberculosis is ranked at the second highest following diarrhoeal in terms of both morbidity and mortality. Currently there are about 3.5 million tuberculosis cases in Bangladesh, of which about 500,000 are sputum positive cases that spread the disease all over the country. There are about 150,000 new cases of tuberculosis and 80,000 people die of this disease every year.

In view of the above-mentioned situation, the Government of Bangladesh, while seriously tackling the problem by incorporating the programmes for controling the tropical diabetes and allied diseases and tuberculosis into its second and third five-year plans, set up the Project for Medical Equipment Supply in the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (hereinafter referred to as the "BIRDEM") and Tuberculosis Control Facilities at both the national and district levels, including National Tuberculosis and Leprosy Control Project, and requested the Government of Japan for grant aid in order to implement the Project.

In response to the above request of the Government of Bangladesh, the Government of Japan decided to conduct a basic design study on this Project and sent a basic design study team to Bangladesh from the Japan International Cooperation Agency (JICA) from January 14th to February 5th, 1988. The team had a series of discussions on the Project with the officials concerned of the Goverment of Bangladesh, concluded the minutes with the Ministries concerned (Ministry of Social Welfare and Women's Affairs for the BIRDEM and Ministry of Health and Family Planning for tuberculosis control), conducted site survey and collected necessary data and information. After returning to Japan, the team made further studies and prepared the basic design based on the analysis of the findings of the survey and taking into account the results of the above-mentioned discussions.

BIRDEM is a national institute of which operational responsibility rests with the National Council under the supervision of the Ministry of Social Welfare and Women's Affairs. With 752 personnel, including the president, as of February 1988, BIRDEM is operating with three divisions of clinical services, education and research. As regards recurring expenditure the Government of Bangladesh contributes grant-in-aid of about 45% of this expenditure. The remaining part of the expenditure has thus far been funded by BIRDEM itself through fund-raising activities. It may be added, in this connection, that BIRDEM renders, free of charge, clinical and educational services to all patients of diabetes and allied diseases.

With regard to the Further Development of TB Control Project, under the Director General of Health Services, Ministry of Health and Family Planning who has final responsibility for the implementation of the Project, the National Tuberculosis and Leprosy Control Project and the Tuberculosis Control and Training Institute at the national level as well as TB Hospitals, TB Segregation Hospitals and TB Clinics at the district level are the main subjected facilities. The Government of Bangladesh intends to cover belated TB control measures by promoting treatment and infection preventive services of TB through provision of medical equipment to these facilities.

With regard to the Project for BIRDEM, the basic design for the supply of medical equipment was prepared taking into full account the fact that BIRDEM is the sole central institution concerning tropical diabetes and allied diseases, and that BIRDEM is being telied upon and utilized by the other medical facilities as a referral centre because of its advanced technological capacity of laboratory work, and further, in keeping with the guidelines set out below:

(1) The medical equipment to be supplied shall be fully utilized for upgrading the functional capabilities of BIRDEM on account of the balance between the on-going expansion programme of buildings and the present medical equipment installed.

(2) Maintenance and repair services to the equipment are available not only from the Maintenance Division of BIRDEM but also from supporting agents of manufacturers located in Bangladesh or in neighbouring countries.

Main equipment thus proposed in the basic design are shown below:

Summary of Proposed Medical Equipment

Division	Equipment to be supplied	Quantity
CT Scan & X-Ray	CT Scanner	1
	X-Ray Unit with Angiograph	1
	Ultrasound Scanner	1
Hospital	Operating Lamp	1
	Endoscopic Apparatus Set	1
	etc.	
General Lab. & Biochemistry	Clinical Chemistry Analyzer	2
	Blood Gas Analyzer	1
	Gel Electrophoresis	1
	etc.	
Library & Medical Photography	Video Projection with Camera	1
	etc.	
Research & Laboratory	Gamma Scintillation	1
	Ultra Centrifuge	1
	Liquid Chromatograph	1
	Amino Acid Analyzer	1
	L.S. Spectrophotometer	1
	etc.	
Others	Stand-by Generator	1
	etc.	

With regard to the Medical Equipment Supply Project for the Further Development of Tuberculosis Control Project, the following basic principle for selection was established, placing importance on the equipment useful for the detection and treatment of the disease as well as the health education of the people in rural areas, and for the training of the personnel concerned with the Project.

(1) Provision of equipment which requires a comparatively short period of time in acquiring skill for operation and is essential for the promotion of the Project shall be made to the facilities in rural areas.

(2) Durable equipment with very little possibility of breaking down while operating in the rural facilities and requiring less expense for maintenance and consumables.

Main equipment thus proposed in the basic design is shown below:

Summary of Proposed Medical Equipment

Equipment	Quantity
X-Ray Unit	2
X-Ray Unit with 70mm Camera	5
Microscope	50
Centrifuge	49
Refrigerator	62
Others	

The Government of Bangladesh has agreed on the additional allocation of revenue budget for each Project in order to cover increased expenses to be incurred for the manpower and maintenance of equipment in the facilities concerned. As regards the maintenance and repair of the equipment to be supplied, responsibilities shall be placed on the Maintenance Division for BIRDEM, and the National Equipment Maintenance Organization (NEMO) and/or the Central Medical Store Depot (CMSD) belong to the Ministry of Health and Family Planning for the Tuberculosis Control Project, respectively.

The equipment proposed in the basic design is indispensable for the implementation of each Project. It is apparent that supply of the medical equipment to the facilities concerned will contribute to the promotion of health services of Bangladesh as a whole by enabling BIRDEM to upgrade the standard of medical research mainly at the national level, and by the development of clinical services especially in the rural communities through the Tuberculosis Control Project. Accordingly, the Project is considered to be extremely significant to implement under the Grant Aid Programme.

It seems that the Government of Bangladesh, in implementing the Project for Further Development of Tuberculosis Control Services, earnestly desire to promote the Project by receiving technical cooperation from the Japanese experts in the administrative aspect such as systemazation of the Project, etc. It is recommendable, therefore, that favourable consideration be given if the request will be repeated by the Government of Bangladesh in this regard.

CONTENTS

CHAPTER I. INTRODUCTION

CHAPTER I

INTRODUCTION

Since its independence in March 1971, the Government of Bangladesh has continuously been observing the policy to render indispensable health services especially to the residents of rural areas who occupy 85 to 90 percent of entire population of the country. In recent years, this policy has been incorporated into its 2nd 5-year plan (1980-1985) and 3rd 5-year plan (1985-1990), both of which give higher priority to the reinforcement of manpower and equipment of medical facilities.

There still exist the requirements for economic and social development as well as necessity of establishing self-sufficient conditions in Bangladesh. The Government of Bangladesh, however, has been facing serious financial difficulties due to unfavorable balance of international trade to meet these requirements.

In view of the above-mentioned situation, the Government of Bangladesh requested the Government of Japan for Grant Aid in order to implement the Project for Medical Equipment Supply to BIRDEM and to the Tuberculosis Control Facilities drawn up as one of its programmes under the Third Five-Year Plan.

In compliance with the above request, the Government of Japan decided to conduct a basic design study on this Project, and sent to Bangladesh a basic design study team from the Japan International Cooperation Agency(JICA), from January 14th to February 5th 1988. The team had a series of discussions with the officials of the Government of Bangladesh concerned, confirmed the contents, objectives and implementation plans of the Project, surveyed subject facilities and other related medical institutions and mutually signed the minutes of understandings.

After returning to Japan the team analysed the data, the information collected and results of the study. In the process of the analysis, the team prepared the basic design concentrating importance on the supply of equipment to be directly used for the curative services and research and educational divisions. The equipment for the kitchen and laundry as well as the cargo lifts were excluded from the supply list for BIRDEM, accordingly. As for the equipment for the Tuberculosis Control Facilities, higher priority was given mainly to those for tuberculosis detective purposes and, therefore, sophisticated and electronical equipment such as blood analyser and computer were excluded from the list. This report describes project components, scope, implementation plan, implementation schedule and estimated cost of the operation and maintenance work.

CHAPTER II. BACKGROUND OF THE PROJECT

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BACKGROUND OF THE PROJECT

2.1 General Situation of Bangladesh

Bangladesh became independent on 26 March 1971. It is located in the eastern-most part of the Indian Subcontinent and borders on the South-east Asia. The history of this country reflects these special characteristics of topography.

More than 85% of the total population is Muslim, while Bengalese is the national and official language. English is widely used among intelligentsia.

2.1.1 Geography and Population

(1) The Area of Bangladesh is 143,998 square kilometers(0.38 times of Japan), most of it located in the delta area defined by the Ganges and Brahmsputra rivers that originate from the Himalayas and Tibet, respectively. Annual average rainfall is 2,300mm; the climate is tropical monsoon. The capital of Bangladesh is Dhaka. Administratively that country is divided into four (4) Divisions, sixty-four (64) Districts, four hundred and sixty (460) Upazila and about forty-five hundred (4,500) Unions.

(2) Total population in 1985 was about 100.6 million, of which 85-90% live in rural areas. Population per one square kilometer is about 700 persons, and the annual increase rate is 2.6%.

2.1.2 National Economy

(1) As regards the economic situation of Bangladesh, agriculture occupies more than 50% of GDP (Taka 78,136 million during the year 1985-1986). While rice is the biggest agricultural product in the country, it does not yet ensure self-sufficiency. Bangladesh has to depend on the importation of rice of more than 100 million tons, one of the reasons for its deficit balance of international trade. On the other hand, jute and jute products are the most important export items, occupying more than 58% of the total exports in 1984-1985. Mineral resources are not sufficient except for natural gas.

(2) During fiscal 1985-1986 there were indications of smooth growth in the economy of Bangladesh. The actual growth rate of GDP against teh previous year was 4.9%, mainly because of the 10% growth in crops and manufactured products, the highest rate. On the other hand, estimated trade deficit in fiscal 1986-1987 was $1,543 million (the estimated amount of exports and imports being $950 million ($939 million in the previous year) and $2,493 million ($2,674 million in the previous year), respectively).

In spite of the above-mentioned trade deficit, estimated total surplus was $112 million because of remittances from migrant workers in various foreign countries ($570 million) and financial assistance rendered by the foreign countries and international organizations etc.

(3) As for the foreign aid in fiscal 1985-1986, estimated commitments and disbursements were $1,870.8 million ($1,972.9 million in the previous year) and $1,361.6 million ($1,267 million in the previous year), respectively; the breakdown of disbursements was $726 million in project aid, $394 million in commodity aid and $241.6 million in food aid(44.55% for grant and 55.45% for loan).

Breaksdown of the Japanese Government's grant aid to Bangladesh by fiscal year is as follows:

1981 : ¥1,087.7 million (¥250 million in health sector)
1982 : ¥1,156.8 million (¥290 million)
1983 : ¥1,142.7 million (¥1,838 million)
1984 : ¥1,379.3 million (¥2,512 million)
1985 : ¥1,478.8 million (¥610 million)

(4) National Budget in fiscal 1986-1987 was Taka 48,400 million for income and Taka 37,400 million for expenditure, balance of which will be used for funding the annual five-year development plan. Expenditures include Taka 6,970 million for education, Taka 6,590 million for national defense, and Taka 2,410 million for health and population control. Expenditure for the development of domestic economy such as industry and public works are financed by the annual development plan.

2.1.3 National Development Plan

(1) The Government of Bangladesh's first 5-year plan began in 1973, followed by the Second 5-Year Plan in 1980 aimed at securing national economic and social development. The present Third 5-Year Plan started in 1985.

(2) Total allocation in the Third Five-Year Plan (1985-1990) is Taka 386 million (resourses from domestic and foreign sectors are Taka 177.52 million and Taka 210.28 million, respectively), which includes (a) Taka 13.7 million for Education and Religious Affairs, (b) Taka 6 million for Health, (c) Taka 9.4 million for Population Control and Family Planning, and (d) Taka 12.5 million for Social Welfare and Women's Affairs.

The major objectives of the Third Five-Year Plan are as follows:

(a) Reduction of population growth
(b) Expansion of productive employment
(c) Universal primary education and human resource development
(d) Development of technological base for bringing about long-term structural change
(e) Food self-sufficiency
(f) Satisfaction of minimum basic needs of people
(g) Acceleration of economic growth
(h) Promotion of self-reliance

(The Appendix 2, 2-2, Table(1) shows "Development Expenditure of the Government by Sector" during fiscal 1977-78 to 1984-85.)

2.2 General Situation of Health Services

2.2.1 Basic Data on the Health Conditions

Most of Bangladesh is low-lying area less than 10m above sea level, flooded by the swollen rivers in the rainy season from March to October. In addition to this sanitary danger, high temperature and humidity make disease-causing bacteria and parastic worms breed. These factors are the main causes of the poor health situation prevailing throughout the country.

In spite of the efforts of the Government of Bangladesh to tackle the problem by developing and strengthening the health services mechanism, no satisfactory result has yet been achieved. It is hoped, therefore, that rapid and effective measures should be taken for the betterment of health situation expecially in rural areas where the people occupying 85 to 90 percent of entire population reside under severe living conditions.

(1) Statistical Data on Births and Deaths etc.

(a) Life expectancy at birth

There is a declining tendency from 56.9 years old in 1980 to 55.1 years old in 1985 as shown below:

Year	Life Expectancy at Birth		
	National	Male	Female
1980	56.9	57.0	57.1
1981	54.8	55.3	55.4
1982	54.5	54.5	54.8
1983	53.9	54.2	53.6
1984	54.8	54.9	54.7
1985	55.1	55.6	54.9

Source: Statistical Year Book of Bangladesh, 1986.

(b) Crude Birth Rate and Crude Death Rate per 1,000

Both Birth Rate and Death Rate show increasing tendency from 33.4 and 10.18 in 1980 to 34.2 and 12:00 in 1985, respectively, as shown in the table below:

Year	Crude Birth Rate	Crude Death Rate
1980	33.4	10.18
1981	34.6	11.50
1982	34.8	11.90
1983	35.0	12.30
1984	34.8	12.30
1985	34.2	12.00

Source: Statistical Year Book of Bangladesh, 1986

(c) Population Growth Rate

There is a declining tendency from 2.31 in 1981 and 2.22 in 1985 as shown below:

Year	Population Growth Rate
1981	2.31
1982	2.26
1983	2.27
1984	2.25
1985	2.22

Source: Statistical Year Book of Bangladesh, 1986

(d) Infant Mortality Rate per 1,000 Live Births

There was an increasing tendency from 101.4 in 1980 to 121.8 in 1984, but declined to 109.2 in 1985 as shown below:

Year	Infant Mortality Rate for 1,000 Live Birth
1980	101.4
1981	111.5
1982	121.9
1983	117.5
1984	121.8
1985	109.2

Source: Statistical Year Book of Bangladesh, 1986

(2) Leading Causes of Death (1984)

In 1984, diarrhoeal (17.3%), lung and respiratory diseases including tuberculosis (13.4%), old age complications (9.6%) and unknown fever (5.8%) were outstanding as the leading causes of death as shown the table below:

Cause	%
1. Stomach diseases, including diarrhoeal diseases	17.3
2. Lung and respiratory diseas including TB	13.4
3. Old age complications	9.6
4. Unknown fever	5.8
5. Asthma	3.8
6. Jaundice	3.8
7. Tetanus	3.8
8. Skin diseases	3.8
9. Child death due to prematurity and perinatal causes	3.8
10. Worm infestation	1.9
11. Gastric ulcer	1.9
12. Typhoid	1.9

Source: Health Report of the Regional Office for South East Asia of WHO, 1986

(3) Leading Causes of Morbidity (1981)

In 1981, diarrhoea (22.3%), colds, coughs and other infections including tuberculosis (19.7%), malnutrition and anaemia (17.6%) and skin diseases (13.0%) were outstanding as the leading causes of morbidity as shown the table below:

Cause	%
1. Diarrhoea	22.3
2. Colds and coughs, and other respiratory infections including TB	19.7
3. Malnutrition and anaemia	17.6
4. Skin disease	13.0
5. Night blindness	3.5
6. Worm infection	3.5
7. Malaria	2.5
8. Measles	1.1
9. Goitre	0.8
10. Poliomyelitis	0.7
11. Tetanus	0.04
12. Neonatal tetanus	0.02
13. Leprosy	0.02
14. Other conditions	15.22

Source: Health Report of the Regional Office for South East Asia of WHO, 1986

(4) Medical Personnel

Number of medical personnel was 76,524 in 1986 as shown in the table below:

Category of Personnel	No. sanctioned	No. in position
1. Medical (Doctors)	7,175	6,161
2. Dental Surgeons	539	238
3. Nurses	5,134	4,288
4. Other Officers (Non-Medicals)	615	505
5. Medical Assistants	2,069	1,931
6. Para Medicals		
(a) Pharmacists	2,596	2,268
(b) Technicians	4,004	3,290
(c) Radiographers	645	257
7. Domicillary Staff		
(a) Health Inspector	1,400	906
(b) Assistant Health Inspector	4,200	2,612
(c) Health Assistant	21,000	13,759
8. Administrative Support Personnel	6,332	4,030
9. Menial Staff	20,815	19,908
Total	76,524	60,153

Source: Health Services Report, Ministry of Health and Family Planning, 1986.

(5) Medical Facilities, Beds and Patients

In 1985, about 43.25 million patients received treatment at 1,821 various medical facilities located throughout the country. Detailed figures are shown in the table below:

Medical Facilities	No.	No. of beds	No. of in-patients (1,000)	No. of out-patients (1,000)
National Institution	5	1,500	30	324
Medical College Hospital	8	5,511	178	2,740
General Hospital	61	3,893	207	4,122
Upazila Health Complex	344	10,684	273	16,753
Mental Hospital	1	400	3	10
TB Hospital	12	566	3	-
I.D. Hospital	5	180	13	30
Leprosy Hospital	3	130	1	9
TB Clinic	14	-	-	436
School Health Centre	23	-	-	155
Urban Clinic/Dispensary	39	-	-	997
TD/UHC/SC/RD/Clinic/HFWC	1,275	-	-	16,929
Dental College Hospital	1	-	-	30
Total	1,821	22,874	7,080	42,545

Source: Health Services Report, Ministry of Health and Family Planning, 1986

(6) Medical Education and Research

(a) To increase medical manpower in the field of treatment, importance has been attached to medical institutions. There were 8 medical colleges, one dental college, 6 post-graduates medical institutes, 8 medical assistant training school, one college of nursing, 2 para-medical institutes and 38 nursing training institutes in 1985. By fiscal 1986-1987 the cumulative number of qualified doctors stoods at 18,102 in a population of 100 million, thereby giving a doctor- population ratio 1:5,524.
(Attached Table(1) shows annual intake of the institutes mentioned above and output in 1985.)

(b) The medical education system and the system of education for fields other than the medical field is shown in the Attached Table(2).

(c) The health policy of the Government of Bangladesh also lays importance on health system research and bio-medical research relevant to the prevailing health situation. Bangladesh Medical Research Council is responsible for coordinating and promoting bio-medical research activities in the country. However, because of financial limitations the Government of Bangladesh is hoping for active foreign assistance in this field.

Attached Table(1)

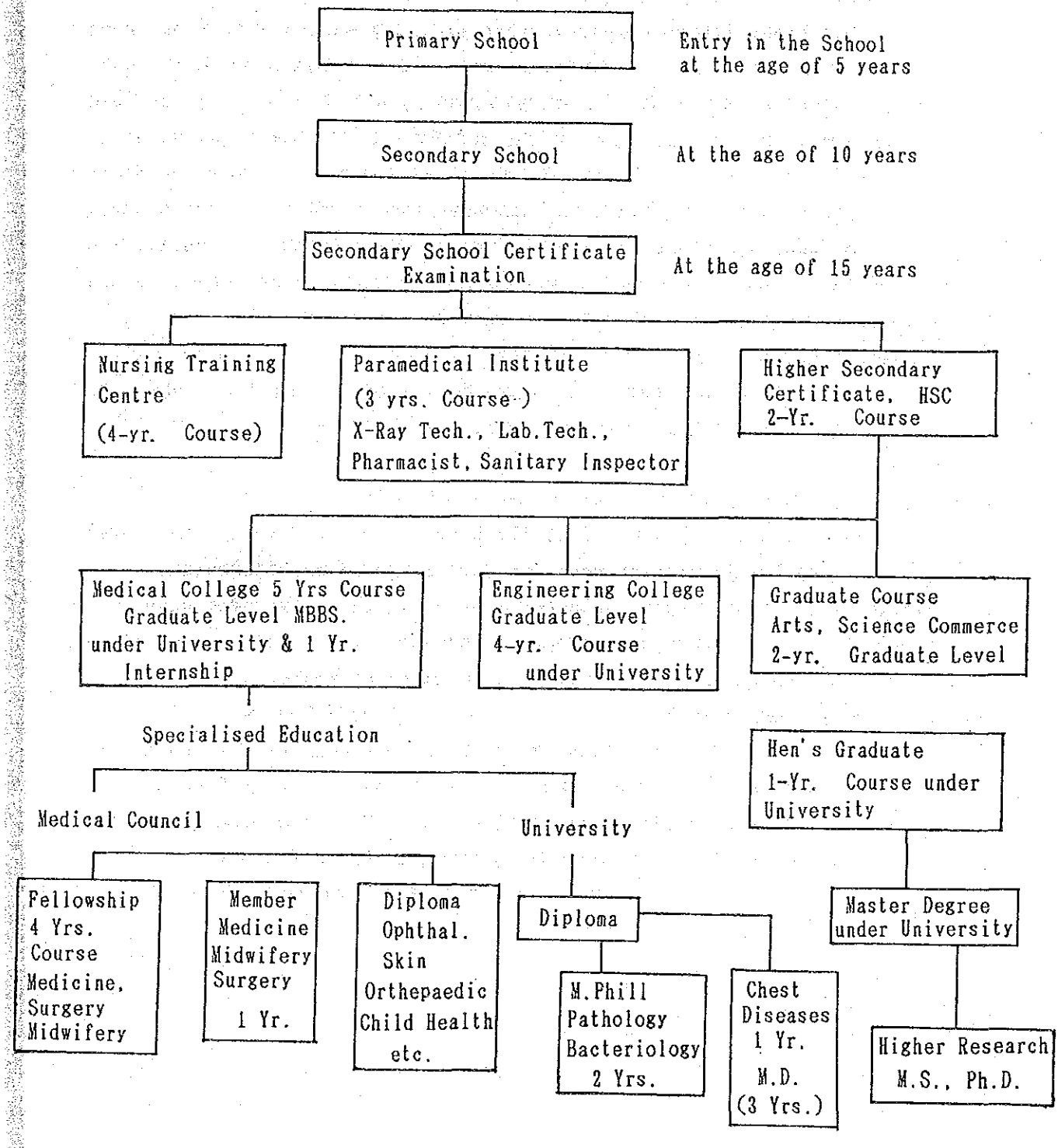
Annual intake and output of medical institutes

(1985)

Type of Institute	Annual intake	No. passed (1985)
1. Medical College (8)	1,188	1,322
2. Dental College (1)	53	56
3. Post-Graduate medical Institute (6)	152	112
4. Medical Assistant Training School (8)	240	117
5. College of Nursing (1)	54	37
6. Paramedical Institute (2)	356	113
7. Nursing Training Institute (1)	38	626

Attached Table(2)

EDUCATION SYSTEM



2.2.2 General Situation of Related Sectors of the Project

(1) Treatment of Diabetes and Allied Diseases

Similar to developing countries in Southeast Asia and part of South America and Africa, there are many patients in Bangladesh suffering from the malnutrition-related "Diabates Mellitus", so-called tropical diabetes, which is not seen in the advanced countries. The number of the patients is estimated at about 2% of the adult population (about 2 million). Although a small percentage of children are also afflicted from the disease, most of the patients belong to the age group of productive activities in their lives, thereby constituting a major obstruction to the economic development of the country.

Tropical diabetes can be divided broadly into two categories, the features of which are as follows:

(a) Malnutrition-related diabetes

1) Onsets in youth (usually between the age of 14 - 40 years)
2) Insulin resistance (requires large doses of insulin)
3) Ketosis resistance (absence of ketoacidosis even when insulin injections are withdrawn for long periods of time)
4) Results from a history of undernutrition in infancy or childhood.
5) In addition to the above the following features are seen:
   i) History of recurrent abdominal pain from childhood.
   ii) Pancreatic clarification and/or fibros of the gland
   iii) Evidence of exocrine pancreatic insufficiency.

(b) Protein-deficient Pancreatic Diabetes

1) Onset of symptoms before the age of 35 years (usually between the ages of 15 - 25).
2) Underweight and has clinical stigmate of present or past malnutrition and of other deficiency status.
3) Absence of a history of recurrent abdominal pain.
4) Absence of radiographic or other evidence of intraductal pancreatic calcification or dilation of the ducts.
5) Absence of demonstiable malabsorption of nutrients caused by exocrine pancreatic insufficiency.

Men patients of tropical diabetes outnumber women by 3 to 1. Since this disease has a positive correlation with coronary heart diseases, neurophathy, retinopathy etc., and many infections are intensified in this disease, the patients will die in 15 years from the onset of the disease if they are not given proper care.

In order to tackle the above-mentioned situation, the Government of Bangladesh has been supporting the activities of BIRDEM, which is sole national institute in the country, by rendering financial assistance to it. In order to achieve the objective to further upgrade the functions of BIRDEM, the Government has initiated the development programme of BIRDEM incorporating into it the 2nd and 3rd five-year plans by which the expansion of physical facilities of BIRDEM has been financed by the Government. Due to financial limitations, however, the Government of Bangladesh faces difficulties in providing necessary equipment for the betterment of clinical, educational and research activities of BIRDEM.

(2) Further Development of TB Control Services

Tuberculosis, together with the other diseases of chest and respiratory organs, is the very important public health problem of which both morbidity and mortality are next highest to diarrhoeal disease. There are about 3.5 million TB cases throughout the country, of which about 500,000 are sputum positive cases that spread the disease all over the country. Currently, estimated incidence of new case is 150,000, and about 80,000 people die of TB every year.

In spite of the above-mentioned situation, however, the TB control programme of the Government of Bangladesh initiated in 1976 and being incorporated in the second and the third five-year plans seems to be rather behind other programmes in the health sector. Especially, manpower in the TB control is too little to tackle the problem. Total number of personnel directly concerned throughout the country is only 413 includidng 168 medical doctors, 150 nurses and 95 home-visit social workers.

It is necessary, therefore, to take effective measures of prevention, detection, treatment of TB cases and appropriate teaching/training of personnel concerned as soon as possible.

2.2.3 Present Situation of National Administration on Health Services

2.2.3.1 National Health Policy

The Ministry of Health and Family Planning is mainly responsible for health services in Bangladesh, of which major policy objectives are as follows:

(1) To provide primary health, including treatment of simple ailments of children, improvement of facilities for mothers during pregnancy and child birth, family planning services, protection from communicable diseases, environmental sanitation, applied nutrition and health education.

(2) To promote the education and training of appropriate health personnel to meet the needs of the entire population.

(3) To strengthen and integrate national epidomiological surveillance, control and containment activities against all communicable diseases.

(4) To improve the specialized services and other health care facilities both qualitatively and quantitatively.

(5) To encourage systematic improvement in the practice of the indigenous system of medicine and to utilize the additional manpower available in that sector.

(6) To provide special health care services to the industrial workers to minimize occupational hazards and accidents and to enhance the efficiency of industrial labour for increased productivity.

(7) To develop people oriented national health services, so that maximum possible community involvement in the health service participation will be ensured.

(8) Close collaboration will be maintained with national agencies entrusted with health services such as community water supplies and disposal of wastes, and also with other health-related sectors.

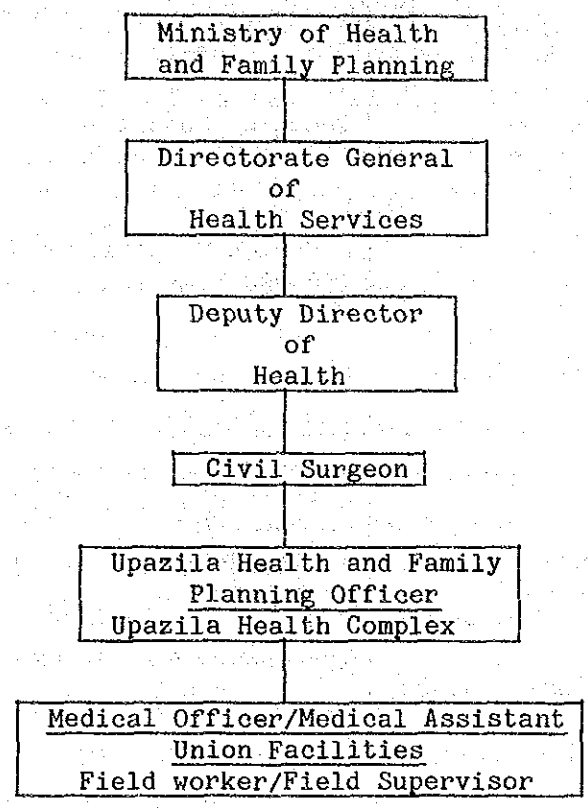
(9) To encourage medical services research relevant to the health problems of the country.

2.2.3.2 Organization of Health Services

The health services organization of Bangladesh follows the general administration division of the country. Administratively, the Ministry of Health and Family Planning is responsible for policy and planning at the national level. Under the Ministry, there are two Directorates General, one for health and the other for family planning. The Directorate General of Health Services is responsible for implementation of all programmes and for providing technical guidance to the Ministry.

The Civil Surgeon under the Deputy Director is responsible for supervision and coordination of health services in all districts of the division (mainly for tertiary health care and secondary health care). The Upazila Health and Family Planning Officer is in charge of the Upazila Health Complex and is responsible for all health service activities including domiciliary services by field workers. At the Union level, there are Health and Family Welfare Centres/Sub-Centres, and one Medical Officer/Medical Assistant is in charge of this Union facility. In addition, there are a number of field workers and field supervisors in each union who are responsible for their activities. Total staff strength of different categories in the health services is 76,524 as of June 1986.

The following chart gives an outline of the above-mentioned health services organization:



The Project for Further Development of TB Control Services is implemented under the supervision and guidance of the Ministry of Health and Family Planning, while the Ministry of Social Welfare and Women's Affairs is in charge of the Equipment Supply Project to the BIRDEM, and the Joint Secretary of the Ministry is responsible for the supervision on and consultant for this Project.

In this connection, WHO Regional Office for South East Asia indicates basic health structure in Bangladesh as the following table:

Level of Care	Administrative Unit	Health Facility	Population covered
Tertiary Health Care	Division (4) or District	Teaching Hospital (8) (400-1,000 beds each)	10-15 million
Secondary Health Care	District (64)	District Hospital (59) (50-200 beds each)	1-2 million
Primary Health Care and First Contact with Health Care	Upazila (460)	Upazila Health Complex (344)	200,000-450,000
	Union (4,500)	Union Health & Family Welfare Centre (2,500)	21,000
	Community Level (13,500)	Family Welfare Assistant(1) Health Assistant (1)	7,000
	Village (86,000)	Traditional Birth Assistant and Village Health Volunteers	1,000-1,500

2.2.3.3 Health Allocations of National Budget

Like other national development programmes, health service programmes in Bangladesh are financed from two budget sources, namely Revenue Budget and Development Budget. The operation and maintenance of the health facilities and on-going programmes are normally financed through the mechanism of the Revenue Budget, while the development programmes under 5-year plans are financed from the Development Budget.

Since the Development Budget is mainly used for the building of new physical facilities, programmes requiring additional supply or replacement of equipment shall often be supplemented by assistance from foreign countries or international organizations. Health allocations of national budget from fiscal 1980-81 to 1986-87 are shown in the Attached Table(3).

WHO Regional Office for South East Asia compares the national health expenditures devoted to primary health care in the countries of the region in 1985 as follows:

Country	Expenditure on Primary Health Care (%)
Bangladesh	50.0
Burma	64.8
India	33.3
Indonesia	25.0
Maldives	100.0
Mongolia	40.0
Nepal	68.8
Sri Lanka	31.5
Thailand	38.8

Attached Table (3)

Public expenditure on health and related activities

(Thousand taka)

Name of the Sector	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86 (R.E.)	1986-87 (B.E.)
Health organization	208,737	226,453	227,095	340,876	441,598	382,492	457,070
Hospital and Dispensaries	172,285	199,742	254,837	297,804	488,147	309.007	3,575,120
Colleges and Schools	63,155	45,648	59,526	81,585	92,772	85,965	102,906
Mental Hospitals	3,535	3,262	6,011	5,081	7,395	6,832	7,218
Epidemic Control	37,249	25,239	27,244	35,512	15,901	5,248	6,413
Health Research	6,663	6,224	7,699	7,052	—	—	—
Health Centre	172,908	272,864	321,961	439,575	60,293	14,298	18,437
Pasteurized Institute and Health Research	3,865	3,049	4,085	4,080	19,873	19,525	20,500
Population Control and Family Planning	122,837	133,113	124,466	138,417	189,897	98,371	206,200
Grants for Health Purpose	10,027	13,509	14,693	22,971	20,426	41,209	36,209
Public Health Organisation	34,668	2,061	—	—	—	—	—
Drug and Drug Court Admn	—	—	2,727	8,034	2,845	3,863	4,940
Work and Reform Activities	20,202	1,011	1,172	1,042	2,401	7,000	7,000
Upazila Hospital	—	—	—	—	343,770	41,143	999,062
Others	—	—	—	—	134,810	115,938	186,153
Total Revenue Expenditure	856,131	932,175	1,051,516	1,382,029	1,820,128	1,130,891	5,627,228
Total ADP Allocation	658,300	742,300	808,341	1,133,649	1,292,567	2,054,971	2,379,300
Grand Total	1,514,431	1,674,475	1,859,857	2,515,671	3,112,695	3,185,862	8,006,528
Index	113	125	139	188	232	238	357
Total expenditure as % of GDP	0.65	0.63	0.64	0.72	0.74	0.66	0.99
Percapita expenditure(at current prices)	16.84	18.28	20.31	26.29	31.38	31.32	47.07

Source : Compiled by B.B.S

2.3 Present Situation of the Project Concerned

2.3.1 Development Programme of Health Services

(1) The Government of Bangladesh has been making efforts in developing and upgrading its health services programmes in the five-year plans. During the period of the Second Five-Year Plan the Government allocated Taka 4,130 million (2.6% of total expediture allocations); 59% of health expenditures amounting to more than Taka 370 million was spent for the development of rural sector. Out of 93 programmes planned during the period, 12 programmes were canceled and 46 programmes were completed; the remaining 36 programmes were carried over to the Third Five Year Plan. A review of performance of main health programmes is described below.

(a) Rural Health Infrastructure

Of the planned 356 Upazila Health Complexs, as many as 341 were made functional and 100 UHCs were fully completed. And, 2,330 Union level establishments were made available against the target of 4,500 in the Second Five- Year Plan.

(b) Hospital and Specialized Health Care Services

There were 15,343 hospital beds in 1980. During the Second Five-Year Plan 4,318 beds were added making a total of 19,661 beds as against targetted 25,382 beds.

Establishment of 250 bed hospitals in Khulna and Comilla could not be completed while most of the work of a 200-bed hospital at Narayangonj was completed through Japanese assistance.

(c) Health Manpower

The cumulative number of medical graduates by June, 1985 was 16,000 against the target of 17,000. Originally it was planned to establish 20 Medical Assistant Training

Schools and 18 of these were actually started. The nurses training programme was also strengthened during the plan period. Total number of trained nurses was 6,500 as against the target of 6,865.

(d) Primary Health Care (PHC)

Quality and coverage of PHC are not up to expectations. Health care facilities have so far covered 30% of total population. BCG immunisation against TB has covered 60% of children under 15 years, while DPT immunisation covered only 2% of children under 2 years and less than 5% of mothers received ante-natal care before deliveries.

Facilities at the UHCs and UHFWCs are inadequate in terms of diagnostic means like X-ray and pathological examination, supplies of essential drugs, vaccines, sera, services for emergency and life- saving surgery and medical care.

(e) In-patient and Out-patient Care

In 1983, there were 57 million admission cases in public sector hospitals; 133 NGOs are also providing health care. Present bed-population ratio stands at 1:3,589. And there are 1,406 out-patient facilities under the Health Services and nearly 51 million patients attended these facilities in 1983. There are 218 out-patient facilities in other Ministries and 313 such facilities in the private sector.

(2) In the Third Five-Year Plan, Taka 550 crore has been allocated for financing the development programmes of health sector including 35 spill-over projects mentioned above. While primary health care activities have been given priority with a share of 73.6% of the total allocation, emphasis is also given on the development of health manpower and medical facilities.

Programme allocation is shown in the table below:

Programme Allocation

(Taka in million)

Programme Area	Allocation	Percentage distribution of total Allocation
(1) PHC and Ancillary Services	2,750.8	50.02
(2) PHC Supportive Programmes	1,295.7	23.56
(3) Health Manpower Development	558.3	10.15
(4) Hospitals and Clinics	804.3	14.62
(5) Programmes of General Nature	90.9	1.65
Total	5,500.0	100.00

2.3.2 Major Programmes in Health Sector

The Government of Bangladesh has put emphasis on the policy to provide all the population living under severe conditions, 90% of whom live in the rural areas, with primary health care, which includes strengthening of networks among various medical facilities at the village, union and upazila levels, training of social workers, and increasing interest and awareness of rural population with regard to the health problems. Major programmes being pursued by the Government are as follows:

(1) Education concerning prevailing health problems and methods of preventing and controlling them

To organize workshops at the upazila level for the rural leaders such as Mosques Imams, school teachers, social workers and women representatives, with a view to promoting community involvement and multisectoral collaboration in the PHC activities.

(2) Maternal and child health care, including family planning

To ensure, under the Third Five Year-Plan, functional integration of health and family planning services at the upazila level and below. The objectives of these programmes are as below:

(a) To ensure access of women to care during pregnancy and delivery by trained persons;

(b) To reduce mortality, morbidity and disability from early childhood infections diseases through immunization;

(c) To reduce morbidity and mortality due to diarrhoeal diseases and malnutrition;

(d) To reduce crude birth rate through family planning; and

(e) To develop self-sufficient MCH care as a part of primary health care and increase coverage of comprehensive services to mothers and children.

(3) Expanded immunization against major infections diseases

This programme was first intiated in 1979. Although the immunization coverage of infants was very marginal by 1984, less than 2% of infants were fully immunized with B.C.G., D.P.T, O.P.V. and Measles vaccine. The priority target population for immunization was changed to the children under 1 year of age.

(4) Control of diarrhoeal diseases

Diarrhoeal diseases are the highest both in terms of morbidity and mortality due to geographical characteristics and climatic conditions as well as poverty, malnutrition, inadequacy of safe drinking water, and poor sanitary conditions of Bangladesh. The Government has, therefore, been taking large-scale measures for training of medical and paramedical personnel and strengthening of surveilance systems comprised of curative, prevention and control activities.

(5) Mycobacterial disease control

The following activities were carried out during the year 1985:

(a) One national and two divisional seminars were organized for strengthening this programme. In total, 78 medical officers participated.

(b) 47 laboratory technicians were trained in sputum microscopy.

(c) 350 Imams were given orientation in TB control program.

The mycobacterial disease control programme is also taken up in the Third Five-Year Plan.

(6) Malaria control

The Government of Bangladesh has been tackling this programme with the collobaration of WHO.

(7) Provision of essential drugs

The Government of Bangladesh has put emphasis on the increased local production of the essential drugs. In 1985, the value of local production of drugs and medicines stood at Taka 310 crore, of which 45 drugs for primary health care accounted for 66%. Local production of vaccine and serum is also encouraged.

(8) Safe water supply and sanitation

It is estimated that nearly 80% of all illnesses in Bangladesh are directly or indirectly linked with poor hygiene arising from inadequate uses of safe water and insanitary disposal of human waste. Children are the most vulnerable group and diarrhoea accounts for the death of nearly 30%-32% of the population in the 1-9 age group.

The Government of Bangladesh, with the close collaboration of WHO and UNICEF, has been endeavouring to better this situation under the sanitation programme.

(9) Health education

In order to promote this programme, the Government of Bangladesh completely re-organized and strengthened in 1981 the "Health Education Bureau" established in 1958.

Present health education covers (a) training and orientation and workshop/seminor for field workers and other medical personnel, (b) production of health education materials such as posters and hand bills, (c) usage of TV and radio programmes, (d) publication of "health-related newsletter" and (e) observance of "World Health Day" etc.

2.4 Foreign Assistance to the Health Sector

2.4.1 World Health Organization (WHO)

WHO has been positively assisting the Government of Bangladesh since its independence in 1971. It has collaborated in both planning and management activities of the national health programmes.

Primary health care, the highest priority programme, has received the full attention of WHO. It has been helping in strengthening of service delivery and management system of primary health care, the student selection process process and the development of curriculum utilized by medical colleges, nurse training schools and para-medical institute as well as expanding the knowledge of PHC at the periphery and in promoting community participation in the health activities.

Some of the important areas in which WHO is closely involved with the Government is as follows:

(a) Country Health Programming
(b) Organization of Health Services based on PHC
(c) Repair and Maintenance of Electro-Medical Equipment
(d) Nursing Advisory Services and Training
(e) Health Manpower Development
(f) Community Water Supply and Training
(g) Local Production of Essential Drugs and Vaccines
(h) Promotion of Immuninzation
(i) Malaria Control

The Attached Table(4) in the next page shows WHO allocation for fiscal 1986 - 87.

Attached Table (4)

W. H. O. ALLOCATION FOR THE BIENNIUM 1986-87 UNDER THE REGULAR BUDGET

BANGLADESH

[Figures in US Dollars]

Programme Area	Allocation for 1986-87
Health Situation & Trend Assessment	151,100
Country Health Programming	680,000
Health Systems Research	113,000
Organization of Health Services Based on Primary Health Care	1,057,800
Health Manpower Development	2,115,500
Development of Health Education Services	151,000
Research Promotion & Development	75,600
Nutrition	37,800
Accident Prevention and Control	37,800
Meternal and Health including Family Planning	113,400
Occupational Health	37,800
Prevention & Treatment of Mental and Neurological Disorders	75,600
Community Water Supply & Sanitation	604,400
Food Safety	37,800
Clinical, Lab. & Radiological for Health Systems Based on PHC	188,200
Essential Drugs and Vaccines	302,200
Drugs & Vaccine Quality, Safety and Efficacy	75,600
Rehabilitation of the Disabled	37,800
Immunifation	377,800
Malaria Control	604,400
Control of Diarrhoeal Diseases	226,700
Tuberculosis	75,600
Leprosy	75,600
Prevention of Blindness	75,600
Prevention & Control of Cancer	75,600
Cardiovascular Diseases	75,600
Other Non-Communicable Diseases-Prevention & Control Activities	75,600
Total	7,555,400

Source : Health Services Report 1985, Directorate General of Health Services, Government of Bangladesh

2.4.2 United Nations Children's Fund (UNICEF)

UNICEF has been cooperating with the Government of Bangladesh since its independence in 1971. Particularly, its contribution in the rehabilitation of malnourished children and mothers is significant. It also plays an important role in literacy education of women in rural areas.

Some of the important areas of activities in which UNICEF helped during the year 1985 include the following:

(a) Growth monitoring
(b) Breast-feeding
(c) Family planning
(d) Food supplementation programme, including supporting activities of home vegetable gardening and training for rural mothers and village volunteers
(e) Child immuinization

2.4.3 United Nations Development Programme (UNDP)

UNDP in collaboration with WHO and other agencies has been providing assistance to various institutions to upgrade the training of medical personnel, through long-term as well as short-term techincal assistance, and supply of equipment, especially for laboratory use. It has also been involved in the training of medical assistants and senior nurses, as well as the regional projects in the prevention of blindness, primary health care, control of rabies and prevention of diarrheal diseases. The total allocation of UNDP to the health sector is US$6,314,000 over twelve years.

2.5 Outline of Subjected Facilities of the Project

2.5.1 BIRDEM

2.5.1.1 Organization and Activities

BIRDEM consists of three divisions clinical services, research and education and had a staff totalling 572 as of February 1988, including 57 medical doctors, 59 nurses, 47 paramedicals, 67 teaching staff, 169 scientists and technicians and 353 other saff such as clerks, ward assistants, X-ray assistants, gate keepers and sweepers etc. with over 64,000 patients listed on its registry as of December 1987.

Activities of each division are as follows:

(1) Clinical Services

Clinical services include identification, treatment, prevention and control of diabetes metlitus and related endocrine and metabolic disorders. There are facilities for both out-patients and in-patients including an ophthalmology department and operation theatres.

(2) Education

In addition to its education programmes including workshops and seminars for doctors, nurses, paramedicals, non-medical health administratiors and community leaders, the Education Division provides regular appropriate education for patients and their families such as daily classroom lectures and demonstrations, which include urine examination and insulin injection, foot care and diet demonstrations. It also provides vocational training to some patients for self-care.

In 1986 a university course was initiated under the Post-graduate Medical Faoalty of Dhaka University to provide higher level education in diabetes, endocrine and metabolic disorders with the courses for degree/diploma including M.D. in DEM(3 yers), M.Phil in DEM(2 years), Ph.D. in DEM(4 years) and Diploma in DEM(1 year) with 13 students, 9 govenment medical officers, 1 foreigner and 3 private participants.

(3) Research

Facilities exist for comprehensive and fundamental research, with full collaboration of WHO. BIRDEM is conducting anthropological study of social causes of diabetes, pancreatic malnutrition diabetes and others.

It should be added, in this connection, that in recognition of its significant activities WHO designated in 1982 BIRDEM as its collaborating Centre for diabetes health-care delivery programme and the International Diabetes Federation also recognized BIRDEM as a model institution of Southeast Asia in 1985. Thus BIRDEM has been internationally recogized as an authoritative curative, research and educational institute for diabetes and allied diseases not only in Bangladesh but the whole of Southeast Asia.

2.5.1.2 Organization and Budget

(1) Although the Ministry of Social Welfare and Women's Affairs supervises the activities of BIRDEM, actual management of it rests with the "National Council" of the Diabetic Association of Bangladesh (organizational system is shown in the Attached Table (5)).

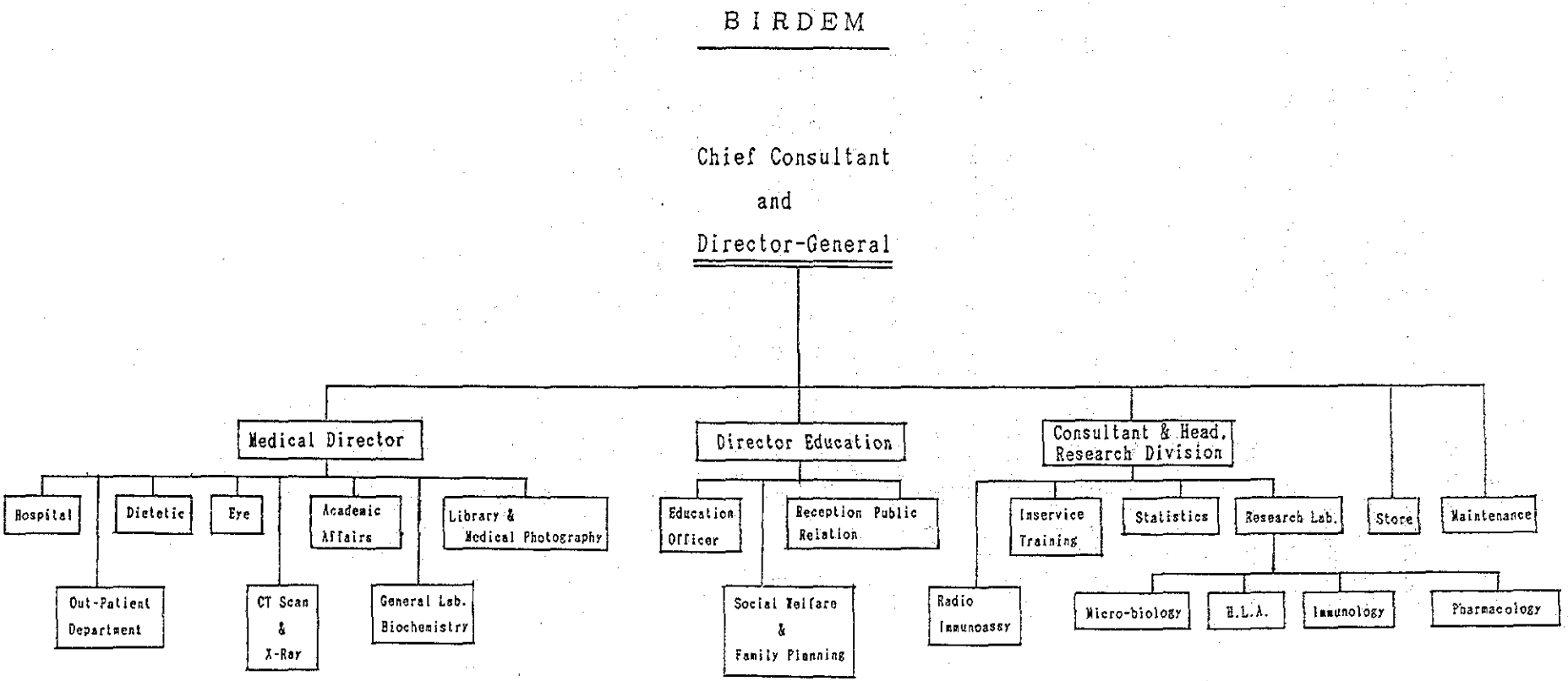
(2) Funding of BIRDEM is divided into two categories, namely, "Development Budget" and "Revenue Budget".

Development costs such as building equipment are entirely met from allocation from the "Development Budget", which is included in the five-year plans of the Government.

As regards funds for recurring expenditure the Government provides about 45% from its "Revenue Budget". The remaining portion of the expenditure is funded by donations from non-governmental organizations, fund raising activities of BIRDEM itself and income from services rendered to non-diabetics such as laboratory examination, X-ray and ultrasonography, etc. Estimated budget of BIRDEM for 1987-1988 stands at Taka 39.77 million, of which Taka 17.00 million will be financed from the "Revenu Budget" of the Government, while remaining Taka 22.77 million will be financed from the resources of BIRDEM.

As for the total amount of budget for this Equipment Supply Project, which is supposed to be completed during fiscal year 1988-1989, is Taka 737.20 million, of which Taka 280.00 millionis be financed from the "Development Budget" of the Government, while the remaining Taka 457.00 million is expected from the Japanese Government's Grant Aid.

Attached Table (5)



2.5.1.3 Activities

BIRDEM, following the principles of the Diabetic Association, has been providing comprehensive and quality health care, training and education, free of cost, for all patients of diabetes and allied diseases, regardless of urban or rural areas, educated or uneducated, rich or poor. The main activities in 1985 were as follows:

(a) 6,350 diabetics had been registered bringing the total to 49,510 upto that year;
(b) 97,712 diabetic patients in total had visited OPD for periodic checkup;
(c) Ophthalomology Department had examined 15,660 patients, including fundus photography and laser treatment;
(d) 18,720 radiographic diagnoses had been done;
(e) Laboratory investigations of various biochemical tests were carried out on 105,770 persons;
(f) 9,426 new and old patients received dietary advice;
(h) 48,650 patients and their family members were given educational training;
(i) 166 regular classes were held for doctors and scientists on recent advances in treatment of diabetes;
(j) Regular training classes on medical science for paramedics of the Government. Primary Health Care Services were educated for:
    - 209 medical officers
    - 19 health education officers
    - 137 para-professionals
    - 148 nurses
    - 121 village social workers

(k) The Social Welfare Department

- interviewed 7,057 patients to assess their socio-economic conditions,
- gave motivational counselling to 13,275 irregular patients,
- made 126 home visits in Dhaka,
- undertook social case-studies on 200 juvenile and 231 adult patients,
- distributed 18,429 vials of insulin free of cost and 14,862 at subsidized rate,
- wrote 556 letters to defaulting patients,
- gave vocational training to 7 juveniles,
- found employment for 10 diabetics, and
- followed up 101 patients employed by the Association.

2.5.1.4 Existing Facilities

(1) Physical facilities of BIRDEM are located in the 1.5 hectare square area facing the Airport Road (Mymensingh Road) running the central part of municipality of Dhaka. Three-storied old building and presently six-storied new building are connected by a corridor with stairs. The old building was constructed seven years ago and new building, now being expanded, is fully used up to the sixth story without any obstructions by the construction work going on. (See the following "Main data of each floor of new and old buildings")

In addition to these two buildings, another five-storied building is being constructed as the living quarters of nurses and staff personnel of BIRDEM. The construction work of the new building is scheduled to expand up to a ninth story by the end of 1988, thus the expansion plan up to 14 stories shall be achieved in the near future. (See Appendix 2. 2-1 Figure(1) and Figure(2).)

Main data of each floor of new and old buildings are as follows:

Floor	Square meters	Ceiling height (m)	Old building	New building
1st Floor	3,836.43	3.88	Out-patients Department	Radiography, Maintenance and Workshop
2nd Floor	3,836.43	3.88	Meeting and staff rooms	General Research, Physiotherapy and Laundry
3rd Floor	3,836.43	3.88	Research and Laboratories	Library, Seminar Rooms and Auditorium
4th Floor	1,909.29	3.88	-	Operation, I.C.U. and General Ward (34 beds)
5th Floor	1,307.06	3.07	-	General Ward (40 beds) and Single Ward (7 beds)
6th Floor	1,307.06	3.07	-	General Ward (36 beds) and Single Ward (7 beds)
Total	16,032.70			7th to 14th Floor will be used for general ward and others.
Third Period:	3,481.00			

The present Project requests equipment mainly for the Research and Laboratories in the 3rd floor of the old building, as well as the Radiography and Maintenance in the first floor, General Research in the 2nd floor, Seminar Rooms in the 3rd floor and Operation Theatres and ICU in the 4th floor of the new building.

(2) Room area of each facility is spacious and each piece of equipment is installed taking into full consideration the functional ability of the equipment.

Structure of each building is reinforced Rahmen concrete (rigid form). The old building has two stairewells designed as figure "B", while the new building is designed as figure "H". There is no elevator in the old building, but the new building has two elevators, each accommodating 18 persons up to 5th floor. It is designed to have four elevators and one cargo lift in the future.

(3) The following are the results of study on the facilities which will be affected at the time of installment and operation of large-sized sophisticated equipment.

(a) Air-Conditioning Facilities:

Direct expansion system through ducts is adopted. Covering area of air-conditioning are as follows:

Total Area	:	3,724.31 m^2
General Research Area	:	655.50 m^2
Research and Laboratories	:	524.40 m^2
Radiography	:	524.40 m^2
Operation & ICU	:	618.04 m^2

Generally speaking, there are many buildings in Bangladesh ventilated by fans hanging from high ceilings instead of air-conditioning equipment. Only about a quarter of total area of BIRDEM is equipped with air-conditioning.

(b) Water Supply and Sewerage Facilities:

Supply source : Conduit pipe of municipality (Dhaka Water and Sewerage Authority is in Charge)

Consumption : 13,962 ton/year

Water pressure : 5.0 kg/cm2

Conduit pipe : 50m/m, 37m/m; Galmanized Iron

Sewerage System: Since the public disposal treatment in Dhaka is excellent, direct draining is possible.

(c) Gas supply

Natural gas (1,064 Btu per 1,000 cuft) is used. Consumption was 1,000,000 Kcal in 1986.

(d) Electricity

Electricity facility is installed in the central part of the first floor of the new building. Capacity of transformer is presently 800 KVA, which is planned to be 1,600 KVA in the future. Three phases 400-440V, stabilized supply of 50Hz frequency is secured inside the whole building. Annual consumption in 1986 was 898,464 KWH.

(e) Quality of water

An examination of water was made by the Quality Control & Research Division in January 1984, the results of which are as follows:

Physical Examination	Temperature	: 23°C
	Color	: Colorless
	Odor	: None
	Taste	: None
	Muddiness	: 0.69 N.T.U.
	Conductivity	: 400 MHOS/cm

Chemical Examination	Alkalinity	: 125 mg/L CaCO3
	Acidity	: 5.0 mg/L CaCO3
	Chloride	: 41 mg/L CI-
	Solidity	: 126 mg/L CaCO3
	Calcium	: 30.46 mg/L Ca++
	Iron Content	: 0.36 mg/L Fe
	Phosphoric Acid	: 0.85 mg/L PO4
	Oxygen melting	: 8.1 mg/L O2
	Bacterium	: None

(f) Medical Gas

Medical gas is installed in the central supply room, from where layed pipes are arranged. Although necessary tests have been finished, practical usage will be a matter of the future.

2.5.1.5 Present Situation of Medical Equipment

As regards the physical facilities of BIRDEM, a new building is being constructed. With the expansion of floor space of the new building, some rooms to be occupied by each department are also being changed. In addition, present location of some equipment seems to be inadequate. However, as the maintenance of equipment as a whole is satisfactory except some equipment which has become too old for work and some equipment such as CT Scanner which is not subject to the maintenance contract, operational ability of equipment is very significant.

Equipment for clinical services including the Operation Theatre is not sufficient enough. This is presumably due to the fact that the capacity of BIRDEM for in-patient services has so far been poor. On the other hand, the equipment for research purposes is adequate. However, additional equipment will be requested for strengthening the functions of BIRDEM in the future.

A list of existing equipment in BIRDEM, including number, is shown in the Appendix 2, 2-2, Table(2).

2.5.2 Further Development of TB Control Services

2.5.2.1 Organization and Activities

The National TB & Leprosy Control Project as well as the TB Control and Training Institute are the national level facilities for Tuberculosis Control services under the supervision of the Ministry of Health and Family Planning. It started its activities in 1976 and moved into the present building in 1982. The 73 staff members under the Project Director include 18 medical doctors (11 for medical services, 4 for education and 3 for examination), 5 teachers and lecturers, 7 technicians for research, 12 paramedics, and 31 for clerical and other services. Main activities of this facility are as follows:

(1) To organize, maintain and assess the whole activities concerned with TB control, and to establish and maintain standardized recording and reporting to supervision and evaluation;
(2) To provide diagnosis services mainly by sputum microscopy up to the Union level;
(3) To provide treatment for all patients who are diagonized;
(4) To promote and assess BCG vaccination programme; and
(5) To train personnel of TB Clinics, Upazila Health Complexes and Union Welfare Centres to resolve present extreme shortage of personnel concerned with TB Control with a view to achieve the objective to develop TB Control activities up to the Union level.

The TB Control and Training Institute, whose functions are almost the same as the National TB Control Project, consists of

43 staff members under its Superintendent (9 medical doctors, 11 laboratory technicians etc., 8 home visitors, 2 nurses and 15 clerical staff).

In addition to the above, 4 TB Hospitals, 8 TB Segregation Hospitals, 44 TB Clinics, 344 Upazila Health Complexes and about 2,500 Union Health Centre/Family Welfare Centres conduct, under the supervision and guidance of the National TB and Leprosy Control Project, services of detection (including sputum and X-ray examinations), and treatment and teaching of TB patients. They render these services to the out-patients only with the exception of TB hospitals and TB Segregation Hospitals which have 50-150 beds and 20 beds, respectively.

2.5.2.2 Operational System and Budget

(1) Operational System

The Ministry of Health and Family Planning is in charge of the TB and Leprosy Control Programme, and the highest responsibility for the implementation of the Programme rests on the Directorate General of Health Services of the Ministry. As for the operational system there are Institute of the Disease of Chest and Hospital, National TB and Leprosy Control Project, TB Control and Training Institute, 4 TB Hospitals, 8 TB Segregation Hospital, 44 TB Clinics, 397 Upazila Health Complexes and about 2,500 Union Health Centres and Family Welfare Centres/Rural Health Centres, where medical personnel from doctors to home visit social workers are involved in the TB control activities.

(2) Operations

The outline of TB control activities in accordance with the administrative divisions of the country are as follows:

(a) At the national level, the Institute of Disease of the Chest and Hospital with 400 TB and 100 non-TB chest beds offers specialized services to TB and non-TB chest cases. It is also responsible for training of specialized medical manpower relating to TB services and for undertaking research in the field of TB and chest diseases.

National TB Control Project is another national agency which plays an important role in the formulation of national TB control policy and undertakes short in-service training programme for both medical and paramedical personnel engaging in the TB services.

The TB Control and Training Institute, which has the largest out-patient clinic, is training para-medics like X-ray and Laboratory technicians to be utilized in the TB control programme.

(b) At the divisional level, the Deputy Director of Health Services supervises the activities of all health services of the divisions including TB services. However, since the predominate responsibility of the Deputy Director is for the general health services, TB services receive little of his attention.

At the divisional and district headquarters there are 9 medical college hospitals, whose contribution towards TB patients in the form of case-finding and treatment is too modest, and communication and cooperation with TB institutes like TB clinics and TB hospitals are few and far between.

(c) At the district level there are 44 TB Clinics and 8 TB Segregation Hospitals in addition to 61 district general

hospitals under the supervision of the Civil Surgeon. TB Clinics and TB Segregation Hospitals provide very modest services in TB control with their limited resources. General Hospitals should have TB units with consultants to offer TB control services in the form of case finding, ambulatory and in-patient treatment.

(d) At the union level, TB control activities are supposed to be undertaken by about 1,300 Union Health and Family Planning Centre and rural Health Centres/Dispensaries. At the village level, health workers selected and trained by the Bangladesh Rural Development Committee (BRAC) visit each household to provide basic education on the prevention and treatment of prevailing diseases including TB.

(e) The manpower engaging in TB Control activities at the above-mentioned facilities comprises only 168 medical doctors, 150 nurses and 95 health visitors. Strengthening of such manpower as well as facilities and equipment is also strongly required by the Government.

TB Control services system in Bangladesh on the basis of the administrative divisions is shown in the Attached Table(6).

(3) Budget

The Project for Further Development of TB Control Services is scheduled to be completed in 1990 with the total budget of Taka 137 million of which Taka 585.5 million is borne by the Government of Bangladesh (Revenue Budget:Taka 13.55 million, Development Budget:Taka 45 million), while the remaining Taka 78.45 million is requested for Japanese Government's Grant Aid.

Attached Table (6)

TB Control System on the Basis of Administrative Division

Administrative Level	Facilities for TB Control Services	
	Responsible Person	Facilities
National	Directorate General of Health Services Deputy Directer General	o Institute of Diseases of Chest & Hospital o National TB Control Project o TB Control and Training Institute
Divisional	Deputy Director General	o TB Hospital o TB Clinic o Medical College Hospital
District	Civil Surgeon	o TB Clinic o TB Segregation Hospital o District General Hospital
Upazila	Upazila Health Family Planning Officer	o Upazila Health Complex
Union and Below	Head of Facility/ Organization	o Union Health Centre/Health & Family Planning Centre o Rural Health Centre/ Dispensary o Social Worker/Health Visitor

2.5.2.3 Achievements

(1) At the national level, the National TB & Leprosy Control Project diagnoses an average 5,400 new cases and 22,200 TB and 26,520 non-TB patients annually, while the TB Control Training Institute covers 3,120 cases. Together, these facilities have trained, up to 1987, 316 doctors from different clinics, 324 laboratory technicians, 62 medical assistants, 28 programme organizers, 60 paramedicals, 106 surveillance team leaders and 680 Imam from different mosques.

(2) At the other adminstrative division level, 44 TB Clinics have diagnosed and treated most patients, and services of 116 Upazila Health Centres in this field are not regarded to be satisfactory.

Achievements of TB Clinics and Upazila Health Centres during 1985-1986 are as follows:

(a) TB Clinics

	New Attendants		Sputum Examination		X-ray Examination	
	Number	TB case	Number	Sputum Positive case	Number	X-ray positive case
1985	151,897	36,772 (24.20%)	83,177	10,189 (27.70%)	50,571	19,113 (37.80%)
1986	155,300	40,199 (25.88%)	83,508	11,407 (28.37%)	63,581	24,807 (39.01%)

(b) Upazila Health Complexes

Total number of 3,696 (498 i.e. 13.47% was positive) cases involved a smear examination during 1985.

(3) In addition to the above, 493,209 children between 1-15 years were provided BCG immunization services, and the following activities were carried out during the year 1985:

(a) One national and two divisional seminars were organized with a total participation of 78 medical officers; and

(b) 47 laboratory technicians were trained in Sputum Microscopy in three groups for a 6-day refresher course.

2.5.2.4 Existing Facilities and Equipment

The Project covers National TB and Leprosy Control Project, TB Control and Training Institute, TB Hospitals, TB Segregation Hospitals and TB Clinics. (Location of each facility is shown in the Appendix 2, 2-1, Figure(3).)

The request for the supply of medical equipment of the Government of Bangladesh is mainly for the National TB and Leprosy Contgrol Project and TB Control and Training Institute. The results of the survey of the Study Teas are as follows:

(1) National TB and Leprosy Control Project (See Appendix 2, 2-1, Figure(4).)

This facility is located in the North West part of the municipality of Dhaka. The vast site of it locates not so far from the 46m.-wide Miruru Road. Structure of two-storied 18-year old building is reinforced concrete of Rahmen form with brick wall. Ventilation and lighting are fully equipped through thehigh ceilings and stairwell installed in the center of the building. Total area is 2,430 m^2, 1,880 m^2 for the first floor and 550 m^2 for the second floor. Window air-conditioners are installed in several rooms, but one installed in X-ray room is broken and replacement is needed at the time of equipment supply. As for electricity, both three-phase and single-phase is being supplied in a stabled way, and a 61 KVA transformer is installed. Annual consumption of electricity is 1,500 KWH/year. Complete sewerage facilities have been provided by the Government and natural gas pipes are also installed. Annual consumption of water is 0.55 million gallons.

(2) TB Control and Training Institute

(See Appendix 2, 2-1, Figure(5).)

This facility is located in a quiet area, although a little bit faraway from the central part of Dhaka. The college buildings form a line. The buildings were constructed in 1953. Two-story reinforced concrete building with partly extended 3rd floor makes the exterior appearance of it rather complicated. There is an X-ray room and general diagnosis room attached with vast waiting rooms on the 1st floor. The second floor is used for examination and reseach purposes. Staff rooms are situated side by side. Generally speaking, the equipment and facilities are old, and the air-conditioner installed in the X-ray room is not functioning. Present request is mainly equipment for the X-ray room in the first floor and for detection and research rooms. As mentioned above, replacement of air-conditioner is necessary at the time of installation of equipment. Supply of electricity is stable, but in view of the fact that the switchboard and other machines are old, it seems necessary to replace them. Systems of water supply and sewerage are excellent. Natural gas is also being supplied.

(3) Other Related Institute or Facilities Surveyed

(a) Institute of Disease of Chest & Hospital (IDC & Hospital)

Located in the Mohakhali area of Dhaka. Present building with 500 beds was completed in 1972 after three expansion works undertaken since its establishment in 1953. It has one story, and has been with partly expanded with reinfored concrete and bricks.

(b) National Equipment Maintenance Organization (NEMO)

Located in the Mohakhali area of Dhaka. It is a three-story building of reinforced concrete constructed just two years ago. The first floor is occupied by the maintenance work-shop and three are rooms for coating, meter repairing and refrigerator reparing etc. There is a stairwell to the work-shop, staff room and lecture room on the second floor. Accommodation facilities for the trainees are located on the third floor.

(c) Central Medicines Store Depot (CMSD)

Located in the Tejgaon area of Dhaka. An old two-story office building of brick is surrounded by separate stores for medicines and medical equipment.

2.5.2.5 Situation of Existing Medical Equipment

Present situation of medical equipment installed in the medical facilities engaging in the Project for the Further Development of TB Control Services seems to be insufficient. Many equipment has become too old for work and some of them are completely unusable. There are many European-made equipment including X-ray units, while some electrical machines like air-conditioners are made in Japan. List of main equipment for the Further Development of TB Control Services is shown in the Appendix 2, 2-2, Table(3).

2.6 Background and Contents of the Request

2.6.1 BIRDEM

2.6.1.1 Background of the Request

The Government of Bangladesh, despite its limited financial resources, has contemplated a project, integrated in the Third Five-Year Plan, to upgrade functions of BIRDEM by expanding its buildings and providing necessary equipment and promote its activities of study on diabetes and allied diseases, problems which represent the main barriers to the promotion of social productivitly of the country. The Government requested in April 1986 the Government of Japan for grant aid to supply equipment as well as technical assistance (dispatch of Japapnese experts to Bangladesh and acceptance of Bangladesh trainees in Japan).

The original plan for the supply of medical equipment to the Government of Banglasesh was divided into three phases. These were put together by the Bangladesh side; however, when the Japanese Basic Design Study Team visited Bangladesh, the request for the technical assistance was withdrawn as a result of negotiations between both sides, and thus an agreement was reached to supply equipment only.

2.6.1.2 Contents of the Request

The main contents of the request were confirmed and agreed upon by both the Basic Design Study Team and the Government of Bangladesh, and the minutes including the following items were signed on 24 January, 1988.

(1)The objective of the Project is to upgrade functions of BIRDEM by providing necessary equipment and promote the study on diabetes and allied diseases, from which a considerable number of the people of Bangladesh are suffering.

(2) BIRDEM, under the supervision and control of the Ministry of Social Welfare and Wemen's Affairs, is the executing body of the Project.

(3) The equipment will be selected by the Team based on the list submitted by the Bangladish side and the results of the survey conducted by the Team, which includes the following items.

(a) Diagnostic Equipment

(b) Operation Theatre Equipment

(c) Laboratory Equipment

(d) Equipment for Seminars and Lectures

(e) Equipment for other Departments

2.6.2 Further Development of TB and Leprosy Control Services

2.6.2.1 Background of the Request

In order to prevent the spread of TB by about 0.5 million sputum positive cases out of about 3.5 million TB cases in the country, the Government of Bangladesh has initiated a Project for Further Development of TB and Leprosy Control Services, which has been incorporated in the Third Five-Year Plan. This Project aims to supply necessary equipment to the National TB & Leprosy Control Project , TB Control and Training Institute, TB Hospitals(4), TB Segregation Hospitals(8) and TB Clinics(44). The Government of Bangladesh requested the Government of Japan for the Grant Aid in supplying equipment as well as techincal assistance (dispatch of Japanese experts to Bangladesh and acceptance of Bangladesh trainees in Japan).

Although the official title of this Project had been "Further Development of TB & Leprosy Control Services", the Japanese Basic Design Study Team confirmed during discussions on this Project that the Government of Bangladesh had no intention

to provide the Leprosy Control part with any aid from the Government of Japan since it recieves enough assistance from various domestic and international organizations. As for the request for the technical assistance, it was also agreed by both sides that only equipment will be supplied by the Government of Japan.

2.6.2.2 Contents of the Request

The main contents of the Request were confirmed and agreed upon by both the Basic Design Study Team and the Government of Bangladesh, and the minutes including the following items were signed on 23 January, 1988.

(1)The objective of the Project is to provide equipment for Further Development of Tuberculosis and Leprosy Control Services in Bangladesh.

(2)The Director General of Health Services, Ministry of Health and Family Planning is the executing agency of the Project.

(3)The equipment will be selected by the Team based on the list submitted by the Bangladesh side, which includes the following items, and the results of the survey conducted by the Team:

(a) X-ray Unit
(b) Microscope
(c) Equipment for the Motivation and Health Education
(d) Laboratory Equipment
(e) Medical Refrigerators
(f) Other Equipment