

2) Lalkuthi Sub Center

a. Examination Room

Boiling Sterilizer (1) Examining Room (1) Sphygnomanometer (1)
Stethoscope (1)

b. Treatment Room

Examining Table (1) Instrument Tray (1)

c. Recovery Room

Bed (2) Stretcher (1) Bed Side Cabinet (1)
Boiling Sterilizer (1)

d. Delivery Room

Delivery Table (1) Oxygen Inhalation Machine (1)
Infant Weighing Scale (1)

e. Ward

Bed (3) Cradle (2) Bed Side Cabinet (3)

f. Treatment Room

Treatment Table (1) Boiling Sterilizer (1)
Instrument Tray (1) Instrument Set (1)

2-5 Background and Outline of the Request

2-5-1 Background of the Request

Bangladesh ranks with Cambodia and Nepal in terms of high infant mortality in Asia. The country's infant mortality is 97/1,000, which is one of the highest in Asia. The country's maternal mortality rate is 5.72/1,000, which is also very high. When considering high frequency of childbirth per capita in the country, it can be said that maternal mortality accounts for a considerable percentage of the total number of deaths of women of childbearing age. The high infant mortality and maternal mortality rate are attributable to the poor health and nutrition conditions which most women are placed in, as well as to the low diffusion rate and quality of maternal and child health services.

Furthermore, in rural areas the ratio of institutional delivery is extremely low, and antenatal and postnatal care is conducted by untrained birth attendants under unsanitary conditions, which also contributes to raising the mortality of mothers and babies at deliveries.

In order to resolve these problems, it is important to promote the practice of institutional delivery and to provide more medical facilities with obstetric equipment in rural areas. However, to begin with, it is effective for Bangladesh to train medical personnels like FWVs who have knowledges of hygiene and primary health care, and to station them at rural villages so as to teach safe delivery.

For these reasons, the government of Bangladesh is now implementing a project to establish a Union Health/Family Welfare Center (UHFWC) for every 15,000 to 25,000 population. The government has also plans to train 5,000 new FWVs over the next five years so that at least one FWV may be stationed at each of UHFWC.

The Maternal and Child Health Training Institute (MCHTI) was established in 1953 jointly by East Pakistan, WHO and UNICEF as a 20-bed medical institution to provide MCH services as well as midwifery services and give

clinical trainings to FWVs and health workers.

In 1960, the number of beds was increased to 100. At present, MCHTI accepts about 350 outpatients a day, and total numbers of deliveries is about 3500 a year. MCHTI also gives clinical on-the-job training to more than 700 trainees yearly. These figures indicate that required functions for MCHTI have been expanding.

Despite the increase in the number of beds, the facilities have not been expanded or repaired since 1953 due to budgetary restrictions. Both the facilities and the equipment are superannuated. MCHTI's facilities are always overcrowded with outpatients, and its examination and treatment rooms are not large enough to hold trainees. Thus it is difficult to MCHTI to fulfill the initial goal.

Under these circumstances, the government of Bangladesh formulated a project to strengthen the main center in Azimpur District and a sub center in the Lalkuthi, Mirpur District, and requested the Government of Japan for extending its grant aid to strengthening the facilities and equipment.

In response to the request, the government of Japan decided to conduct a study and sent a preliminary study team to Bangladesh to clarify the background and contents of the request. The preliminary study team acknowledge, in the course of discussions with the officials of the Government of Bangladesh, that the project is aimed primarily at strengthening maternal and child health services and also the training activities which are based on clinical training of MCHTI. And the team also confirmed that the World Bank and other donor organizations were willing to actively cooperate in the operation and management of the MCHTI and the development of its training curricula. As a result of the preliminary study, the government of Japan concluded that it was necessary to conduct a basic design study for the project requested grant aid cooperation, and the Japan International Cooperation Agency (JICA) dispatched a basic design study team to Bangladesh in January 1992.

2-5-2 Outline of the Request

Shown below is the outline of the request, which was based on the contents of the request submitted by the Directorate of Family Planning, the Ministry of Health and Family Welfare of Bangladesh.

(1) Objectives of the Project

To strengthen the facilities and equipment of MCHTI, the main center in the Azimpur District and the sub center in the Lalkuthi, Mirpur District of Dhaka in order to improve the organizational and regional services under the country's maternal and child health program aimed at reducing the maternal mortality and the infant mortality, and to promote the country's health manpower through basic and clinical training in maternal and child health and delivery services.

(2) Project implementing organization

The Directorate of Family Planning, the Ministry of Health and Family Welfare

(3) Activities

1) Health care

- Delivery and antenatal/postnatal medical care
- Maternal classes, guidance on nutrition
- Guidance on family planning
- Basic pediatric medical care
- Immunization of mothers and children under five

2) Training

- Clinical training of medical officer, nurses, Sr. FWVs, FWVs and TBAs

- Theoretical lectures for Sr. FWVs, FWVs and TBAs

(4) Project site

Main center : Azimpur, Dhaka

Site Area: about 2,990m²

Sub center : Lalkuthi, Mirpur District, Dhaka

Site Area: about 4,105m²

(5) Facilities

1) Facilities

	Main Center	Sub Center
A. Outpatient		
a. Obstetrics		
Examination Room	4	5
Treatment Room	2	2
b. Pediatrics		
Examination Room	4	5
Treatment Room	2	2
B. Inpatient		
a. Antenatal		
10 Bed Room	1	1
b. Postnatal		
1 Bed Room	2	2
2 Bed Room	2	2
10 Bed Room	2	2
c. Pediatrics		
1 Bed Room	2	2
4 Bed Room	2	2
10 Bed Room	3	3
d. Other		
Bath Room	2	2
Nurse Station	2	2
10 Bed Room	3	3

	Main Center	Sub Center
C. Operating Labour		
Operating Theater	4	4
Delivery Room	4	4
Doctor's room	2	4
Storage	2	2
Staff Room	2	2
Changing Room	2	2
Labour Room	4	4
Storage	4	4
Changing Room	4	4
D. Laboratory		
Haematology Room	1	1
Immunization Room	1	1
Biochemistry Room	1	1
Dirty Utility	1	1
E. Radiography		
Image Intensifier Room	1	1
General X-ray Room	1	1
Dark Room	1	1
Changing Room	1	1
Record Room	1	1
Storage	1	1
Ultrasonograph Room	1	1
F. Pharmacy		
Pharmacy	1	1
Record Room	1	1
G. C.S.S.D.		
C.S.D.	1	1
Staff Room	1	1
Storage	1	1
H. Administration		
Administration Room	1	1
Director's Room	1	1
Doctor's room	2	2
Conference Room	1	1
Consulting Room	1	1
Administrative Officer Room	1	1

	Main Center	Sub Center
Account Section	1	1
Deputy Director's Room	1	1
Asst. Director's Room	1	1
J. Training		
Auditorium	1	1
Class Room	1	1
Dormitory	1	1

2) Equipment

A. Outpatient

Diagnostic Instrument Set	Weight Scale	X-ray Fill Illuminator	Examining Couch
Examining Desk	Height Scale	Thermometer	Examining Chair
Instrument Cabinet	Sphygmomanometer	Syringes	Dark Room Apparatus
Instrument Carriage	Stethoscope	Ultrasound Equipment	Duplicator
Refrigerator	Doppler Fetus Detector	OHP	Bed Pan

B. Inpatient

Boiling Instrument Sterilizer	Drug Cabinet	Ice Cube Machine	Instrument Cabinet
Medical Refrigerator	Suction Unit	X-ray Film Illuminator	Working Table
Weight Table	Height Scale	Sphygmomanometer	Antenatal Bed
Delivery Bed	Infant Warmer	Ultrasonic Nebulizer	Infant Incubator
Resuscitator	Bed with Mattress	Beside Cabinet	IV Stand
Examining Table	Drying Chamber		

C. Operating

High Pressure Steam Sterilizer	Ultrasonic Cleaner	Instrument Cabinet	Drug Cabinet
Examining Table	Anesthesia Apparatus	Cardiac Monitor	Catheter Tray
Blood Warmer	Endscope	ECG Monitor	Operating Lamp

Operating Table	Suction Unit	Vacuum Extractor	Ultra Violet Sterilizer
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D. Laboratory

Automatic Oilutor	Spectrophoto- meter	Centrifuge	Hemoglobinmeter
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Pipette Washer	High Pressure Steam Sterilizer	Refrigerator	Boiling Sterilizer
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Hemoglobin Meter	Calorimeter	Mciro Hematocrit Centrifuge	Microscope Binocular
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Examination kit

E. X-ray

Automatic X-ray Film Processor	Cassettes	Cassette Exchange Box	Film Illuminator
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Dark Room Accessories	Manual Film Processor	Ultrasonograph	
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F. Pharmacy

Balance	Refrigerator	Distilled Water Machine	Drug Cabinet
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G. C.S.S.D.

Multi Dryer	EO Gas Sterilizer	EO Gas Airrator	High Pressure Steam Sterilizer
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Tube Washer	Tube Dryer	Ultrasonic Cleaner	C.S.S.D. Equipment
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H. Administration

Ambulance	Bus 46 seats	Micro Bus 20 seats	OHP
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Track

I. Training

Video Deck	Video Camera	TV Set	Teacher's Console
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16mm Movie Projector	35mm Slide Projector	Screen	Lecture Desk
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Lecture Chair

CHAPTER 3 CONTENTS OF THE PROJECT

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3-1 Objectives

3-1-1 Objectives of the Project

In Bangladesh, high maternal and infant mortality rates are serious health problems. Maternal and Child Health Training Institute (MCHTI) was established in 1953 as a medical institution to offer clinical training of FWVs and paramedics, maternal and child health (MCH) services, and midwifery services. The number of beds installed in MCHTI has been increased from 20 to 100 since it was established. Despite a marked increase in the number of outpatients as well as training courses, the facilities are superannuated and are therefore unable to fulfill their expected functions.

Its sub center located in Mirpur, which was opened in 1960 to utilize a private house, is operating with 15 beds. Its buildings are superannuated and its equipment is insufficient. Despite the fact that demand for health care is increasing in the surrounding area in keeping with the increase in its population, the sub center remains unable to meet the increasing demand. Under these circumstances, the government of Bangladesh formulated a project to improve the facilities and equipment of MCHTI for the purposes of fostering health manpower and improving the quality of the MCH services. The objective of the project is to construct the facilities and to procure equipment necessary for the implementation of the above-mentioned project and thereby contribute to the improvement of the training activities as well as MCH services of MCHTI.

3-1-2 Significance of the Project

The concept of "Women In Development" (WID) is perceived as an important challenge among international cooperation organizations. Formerly, women were simply the beneficiaries in development programs. This new concept however, is based on the awareness that the success of development

programs will depend on having women regarded not only as the beneficiaries but also as active participants in the program itself.

The Project is significant as a WID project for the following reasons:

- (1) An objective of the project to improve the quality of MCH services with the understanding that women are the primary beneficiaries.
- (2) The training programs conducted at MCHTI are for FWVs and TBAs, who are female workers promoting the health of community residents. Therefore, placing women in leadership roles is at the heart of the project.
- (3) MCHTI is operated and managed mostly by female personnel. This underlines the new idea of women as active participants.

3-2 Examination of the Contents of the Request

3-2-1 Examination of Propriety and Necessity of the Project

MCHTI was established in 1953 when the population of Dhaka was about 276,000. The population of the Dhaka metropolitan area has now reached 6,000,000. However, the total number of beds installed in MCHTI (both main center and sub center) is still only 115. Although there are other delivery facilities in the city of Dhaka, hospital beds for obstetrics are still in shortage, and the ratio of institutional delivery is still low. Therefore, an increase in the number of beds installed in MCHTI is highly expected because it will directly result in an increase in the ratio of institutional delivery.

The government of Bangladesh is implementing a project to construct a Union Health Family Welfare Center (UHFWC) for every 15,000 to 25,000 population under the fourth five-year plan. In each UHFWC, one health assistant (HA) and one FWV are stationed. Therefore, it is planned to train another 5,000 new FWVs over the next five years. The project of strengthening of MCHTI by rebuilding its facilities and procuring necessary equipment in order to improve the quality of its training programs matches the national policy. And it is expected to cause nationwide spread of the effects of the project. It is, therefore, judged to be an urgent necessity to implement the project.

3-2-2 Relation with Other Similar Projects

The government of Bangladesh is trying to improve the quality of the country's MCH services. International donor organizations such as World Bank, WHO, GTZ, USAID are supporting various projects in the area of MCH in the country.

As Japan participated in the World Bank consortium for the first time and expressed its positive support to the Project, which was one of the projects included in the World Bank "Fourth Population and Health

Project", the other donor organization, namely the World Bank, announced their cooperation to the Project.

Japan will continue its policy to collaborate with the other donor organization to implement the Project for ensuring its success and sustainability. Since Japan's grant aid system limits its cooperation program to construction of facilities and procurement of equipment, the followings are understood by the Government of Bangladesh, the World Bank, WHO and the Japanese basic design study team.

- The World Bank / the International Development Association will monitor implementation process of the Project and coordinate the donor organizations to secure proper management and smooth operation of the Project, which includes bearing the recurring cost of the Project, if it is asked to do so by the Government of Bangladesh.
- The World Health Organization will assist the training activities of Maternal and Child Health Training Institute (MCHTI) in developing training curriculum, training materials, etc., if it is asked to do so by the Government of Bangladesh.

MCHTI conducts clinical training of trainees from NIPORT, NIPSOM and other MCH-related training institutions. In order to further promote coordination between MCHTI and other training institutions for the more effective trainings, a high level management committee was formed for overall management of MCHTI and coordination of all health MCH/FP related training. Since the close relationship with NIPORT which supervises FWVTI's activities is indispensable for MCHTI to implement the training activities, discussions were held between GTZ which supports NIPORT and WHO which supports development of training curricula of MCHTI.

3-2-3 Study on Components of the Project

The objective of the project is to expand the initial functions of MCHTI which are intended for the training of paramedics such as FWVs and TBAs and also the provision of MCH services. Therefore, activities at the three main departments, namely, medical department, training department and administration department shall be maintained at the Azimpur Main Center. The Lalkuthi Sub Center is now functioning as a branch office of the main center, and is therefore not an independent organization. The sub center will be organized similarly to the main center under the Project.

The medical department conducts examination and treatment of three units namely: the obstetric/gynecology unit; pediatric unit; and MCH unit. At the obstetric/gynecology unit, medical examinations are conducted mainly for pregnant mothers. Since a referral system with Dhaka Medical College has been established for serious complication, no advanced diagnosis or treatment shall be conducted at this unit even after the completion of this project. At the pediatric unit, the main activity is giving immunization to children under five. Although minor skin diseases, diarrhea and simple infectious diseases are treated at the unit, serious cases are transferred to the medical college hospital or pediatric speciality hospital.

At the training department, as many as 720 trainees annually attended clinical training in the past. The Bangladesh side plans to increase the annual number of trainees. In actuality, however, a management committee to coordinate the training activities has just been formed. Therefore, no increase in the annual number of trainees will be taken into account in phase I of the project to strengthen the main center. The increase in the annual number of trainees will be considered in Phase II of the project to improve the sub center's facilities and equipment.

3-2-4 Examination of the Project Operation Plan

1) Personnel plan

The present MCHTI has a staff of 170. The Bangladesh side is planning to increase the staff number of the main center to 293. At present, the sub center has no full-time staff members, being operated by staff temporarily dispatched from the main center. Under this project, it will have a full-time staff of 240. Table 3-1 shows proposed staff composition of MCHTI prepared by the Bangladesh side.

Table 3-1 Proposed Staff Composition of MCHTI prepared by the Bangladesh side

		Azimpur Main Center			Lalkuthi Sub Center			Total
		Present	Planned increase	Total	Present	Planned increase	Total	
1	Director/Superintendent	0	1	1	0	0	0	1
2	Deputy Superintendent	1	0	1	0	1	1	2
3	Deputy Director	0	1	1	0	1	1	2
4	Training Coordinator	0	1	1	0	1	1	2
5	Sr. Consultant (Gyne/Obste)	2	2	4	0	1	1	5
6	Sr. Consultant (Pediatrics)	0	1	1	0	1	1	2
7	Sr. Consultant (Anesthesia)	0	1	1	0	1	1	2
8	Sr. Consultant (MCH)	0	1	1	0	1	1	2
9	Asst. Director	0	1	1	0	1	1	2
10	Registrar/Asst. Registrar	0	5	5	0	5	5	10
11	Pediatrician	1	0	1	0	0	0	1
12	Medical Officer	2	10	12	0	20	20	32
13	Ultrasonogram Specialist	0	2	2	0	0	0	2
14	Asst. Surgeon	5	0	5	0	0	0	5
15	Pathologist	2	1	3	0	1	1	4
16	Blood Bank Officer	0	1	1	0	1	1	2
17	M.O. Clinical Instructor	0	1	1	0	1	1	2
18	Anesthetist	1	0	1	0	0	0	1
19	Engineer	0	1	1	0	1	1	2
20	Medical Officer (Training)	0	0	0	0	0	0	0
21	Sr. Matron	0	1	1	0	1	1	2
22	Medical Social Worker	1	0	1	0	0	0	1
23	Nutrition Officer	1	0	1	0	0	0	1
24	Supervising Staff Nurse	0	6	6	0	6	6	12
25	Administrative Officer	1	1	2	0	1	1	3

		Azimpur Main Center			Lalkuthi Sub Center			Total
		Present	Planned increase	Total	Present	Planned increase	Total	
26	Statistician	0	1	1	0	1	1	2
27	Sister Tutor	4	2	6	0	6	6	12
28	O.T. Sister	1	7	8	0	5	5	13
29	Jr. Matron	1	1	2	0	1	1	3
30	Stenographer	1	1	2	0	1	1	3
31	Head Assistant	0	1	1	0	1	1	2
32	Accountant	1	0	1	0	1	1	2
33	Sr. Staff Nurse	4	10	14	0	14	14	28
34	Pharmacist	2	0	2	0	0	0	2
35	FWV	30	20	50	0	40	40	90
36	Storekeeper	1	2	3	0	3	3	6
37	U.D. Assistant	1	0	1	0	1	1	2
38	Cashier	1	0	1	0	1	1	2
39	Lab. Assistant	1	0	1	0	0	0	1
40	A/V Operator	0	1	1	0	1	1	2
41	Steward	1	0	1	0	0	0	1
42	Ward Mistress	1	0	1	0	0	0	1
43	Typist Cum Clerk	0	1	1	0	1	1	2
44	LDA Cum Typist	5	3	8	0	5	5	13
45	Record Keeper	0	1	1	0	1	1	2
46	Driver	3	3	6	0	6	6	12
47	House Keeper	1	0	1	0	0	0	1
48	Cook	6	0	6	0	5	5	11
49	Male Attendant	5	0	5	0	0	0	5
50	Ward Boy	0	4	4	0	8	8	12
51	Guard	12	3	15	0	12	12	27
52	Sweeper	23	10	33	0	32	32	65
53	Aya	30	10	40	0	40	40	80
54	Mali	1	0	1	0	0	0	1
55	MLSS	8	3	11	0	8	8	19
56	Dai	9	0	9	0	0	0	9
57	Cash Sharker	0	1	1	0	1	1	2
Total		170	123	293	0	240	240	533

The above personnel plan proposed by the Bangladesh side needs to be modified as follows:

- According to the plan, the number of senior consultants (No. 5 in the table) at the obstetric/gynecology unit of the main center is to be increased from two to four. However, two senior consultants shall be sufficient for the unit in consideration of the activities.
- In principle, a registrar (No.10 in the table) is to be stationed at each clinical unit. This means that four registrars are to be stationed instead of five at both the main center and the sub center.
- One administrative officer (No.25 in the table) is sufficient for the main center though it is planned to have two.
- Medical officers (No.20 in the Table) at the sub center should be classified as follows:

Though position of specialists (No.13 in the table) are planned at the sub center to take charge of operation and maintenance of ultrasonograph, number of staff are not shown. Two such staff members, same as the main center should be appointed at the sub center. Therefore, two of the medical staff shall be replaced with ultrasonogram specialists.

The exact number of assistant surgeons (No.14 in the table) is not shown though the position of it is planned for the sub center. Judging from its total number of hospital beds which is 75% of the main center's bed number, the sub center should have four assistant surgeons.

The exact number of anesthetists (No.18 in the table) is not shown for the sub center. The sub center should have at least one anesthetist.

Despite the fact that the sub center is designed to have a training department of the same scale as the main center, its organizational structure is insufficient. Since up to three

courses will be conducted at one time, the sub center should have three medical officers (No.20 in the table).

- It is necessary to position one medical social worker (No.22 in the table) and one nutrition officer for the sub center to make the organization of the sub center's training department be the same scale as that of the main center.
- Two pharmacists (No.23 in the table) are deemed necessary for the sub center as is the case with the main center. The sub center should also have an assistant to the pharmacists (No.39 in the table).
- The exact number of medical officers (No.20 in the table) for the training department of the main center is not shown. Judging from the proposed scale of the training program at the main center, the training department should have three medical officers.
- It is necessary to allocate one steward (No.41 in the table) for the sub center.
- At present, the main center has no dormitory. The staff member who is supposed to serve as House Keeper (No.47 in the table) actually serves as Ward Mistress (No.42 in the table). Since the main center will have no dormitory in the future, the job title of House Keeper should be deleted.

Table 3-2 shows the comparison between the number of beds and the number of the staff members at similar medical institutions in Bangladesh. The general trend is that the number of staff members per hospital bed is relatively large when the total number of beds is small, but it can be said that the total staff at both the main center and the sub center are within the proper range.

Table 3-2 Comparison of staff members among similar facilities

Name of Facilities	MCHTI (Present)	Dhaka Seishu Hospital	Salimullah Medical College Hospital	Narayanganj General Hospital	MCHTI Main Center (Proposed)	MCHTI Sub Center (Proposed)
Numbers of bed	100	305	600	200	200	150
Numbers of staff	170	400	890	304	293	240
Staff numbers per bed	1.7	1.31	1.48	1.52	1.465	1.6

The following figure shows staff compositions of MCHTI and other similar medical facilities in Bangladesh.

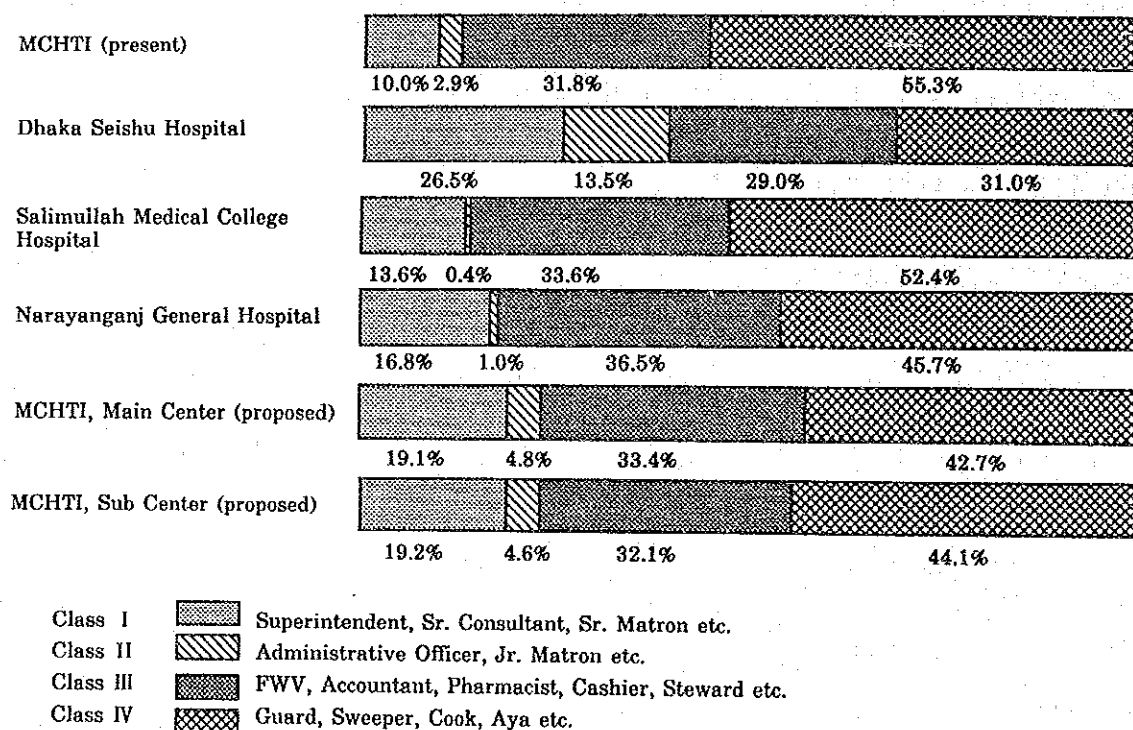


Fig. 3-1 Staff Composition of Medical Institutions

According to Fig. 3-1, Dhaka Seishu Hospital, as it is speciality hospital in pediatrics, has a relatively large number of medical staff and the ratio of staff members ranked Class III and over is high. However, at medical facilities in Bangladesh, staff members ranked Class IV occupies almost half of the total number of staff members in general. Therefore, it is concluded that the personnel plans of both

the main center and the sub center are reasonable to operate the facilities at the local standard.

2) Operating budget plan

As shown in (4) of "3-3-5 Maintenance and Operation Plan," the estimated operational budget after the completion of the project is 38,096,167 TK. Since the annual budget for fiscal 1991-92 of MCHTI is 10,079,012TK, its budget expands 3.78 times when the main center and the sub center are completed.

As the project contributes directly to the improvement of the MCH services of Bangladesh, which is one of the most important policy goals of the country, the Executive Committee for the National Economic Council (ECNEC) has approved the plan to introduce a special budget of 70 million TK for the project over the next four years. This fact evidences the government of Bangladesh's commitment to the implementation of the project. Therefore, it can be said that the government of Bangladesh will be able to effectively cope with a drastic increase in the annual budget of MCHTI in the future. On the other hand, it will impose a heavy financial burden on the Ministry of Health and Family Welfare to secure a budget for MCHTI which is 3.78 times as large as its present one. It is concerned that such condition may cause hindrance for the sound and sustainable operation of MCHTI in the future. It is concluded, therefore, that it will lead to a sound operation of MCHTI to divide the project into two phases, namely, Phase I for the strengthening of the main center and Phase II for the strengthening of the sub center. In that case, operating budget of MCHTI, will be 2.04 times when Phase I of the project is completed, and when Phase II of the project is completed it will be 3.78 times as large as the present budget respectively. The increase in the operating budget for Phase I can be covered with the above-mentioned special budget. And the cooperation to Phase

It will be decided after it is confirmed that the budget for the sub center is allocated by the Bangladesh side.

3-2-5 Examination of the Details of the Requested Facilities and Equipment

The objective of the project is to rebuild the existing facilities of MCHTI which are superannuated and are being used over the limit of its capacity. In examining the details of the request, the utmost emphasis was placed on further improvement of the functions which are presently conducted in the existing facility. Summarized below are the results of the examination of the details of the requested facilities and equipment.

(1) Facilities

The proposed classification of ten categories is not considered appropriate. It is not used at the existing MCHTI, and in addition categories which are closely related to each other are separated in the proposed classification. For this reason, it is considered reasonable to integrate functionally related categories and to reduce the total number of them from ten to the following six:

- ① Clinical service section (pharmacy is incorporated into this section)
- ② Inpatient section
- ③ Operation/Delivery section (operating theater, labor department and C.S.S.D. are incorporated into this section)
- ④ Laboratory section
- ⑤ Administration service department
- ⑥ Training department

The results of the examination of each category shown above is described below:

1) Clinical service section

A maternity classroom shall be added where guidance on daily care and family planning is given to pregnant mothers.

2) Inpatient section

It is planned to increase annual institutional deliveries from 3,500 to 5,000 at the main center and from 200 to 3,000 at the sub center, consequently, 8,000 in total. The number of beds for the main center is proposed to be increased from 100 to 200 and that of the sub center from 15 to 150. The following is an examination of above proposals.

① Examination of the annual number of institutional deliveries

With the population of the Dhaka metropolitan area at 6,000,000 and the birth rate being 36/1,000, the annual number of deliveries in the area is estimated at 216,000. There are following obstetric facilities in the Dhaka metropolitan area, with a total of 2,012 beds installed in these facilities.

Municipal Hospitals	1,512 beds
Dhaka Medical College Hospital	100 beds
Salimullah University Hospital	80 beds
CMS Hospital	20 beds
National Hospital	60 beds
IMPGMR Hospital	30 beds
Narayanganj Hospital	45 beds
Narayanganj Queen Victoria Hospital	50 beds
MCHTI	115 beds

The average stay for delivery is four days including normal, complicated and high risk deliveries at MCHTI. Therefore, the maximum annual capacity of the obstetric facilities in Dhaka metropolitan area is calculated on the basis of this figure.

$$2,012 \times 365 \times 1/4 = 183,595$$

Judging from the above calculation and the estimated annual total number of deliveries in the Dhaka metropolitan area, it can be said that at least 32,405 were non-institutional deliveries. Even if the annual total number of institutional deliveries at MCHTI is increased from the present 3,700 to the proposed 8,000, there will still be a sizable number of non-institutional facility deliveries. Though it is desirable to increase the target annual total numbers of deliveries at MCHTI, the proposed figures themselves are considered maximum in light of the necessary expansion of the facilities and organizations at the two centers required.

② Examination of the number of beds

Azimpur Main Center

- ① The necessary number of hospital beds is calculated on the basis of the proposed annual target number of deliveries of 5,000 and average stay of four days;

$$5,000 \times 4 \times 1/365 = 55 \text{ beds (for obstetric)}$$

- ② Statistics of MCHTI shows 11% of all newborn babies need to be hospitalized for 20 days on average.

$$5,000 \times 11/100 \times 20 \times 1/365 = 30 \text{ beds (for newborn babies)}$$

- ③ Number of pediatric outpatients is estimated at 250 a day (annually 75,000). Statistics of MCHTI shows 5% of outpatients need to be hospitalized for five days on average.

$$75,000 \times 5/100 \times 5 \times 1/365 = 51 \text{ beds (for pediatrics)}$$

- ④ The proposed annual number of deliveries is 5,000. Statistics of MCHTI shows 10% of deliveries are high risk

and hospitalized for 30 days average.

$$5,000 \times 10 / 100 \times 30 \times 1 / 365 = 41 \text{ beds (for gynecology)}$$

Assuming that the occupancy ratio of beds is about 80% and the safety coefficient is 20 percent, then,

$$(\text{a} + \text{b} + \text{c} + \text{d}) \times 1.2 = 212$$

Thus, the minimum total number of beds is 212.

Lalkuthi Sub center

- Ⓐ The necessary number of hospital beds is calculated on the basis of the proposed annual target number of deliveries of 3,000 and the average stay of four days;

$$3,000 \times 4 \times 1 / 365 = 33 \text{ beds (for obstetrics)}$$

- Ⓑ Statistics of MCHTI shows 11% of all newborn babies need to be hospitalized for 20 days on average.

$$3,000 \times 11 / 100 \times 20 \times 1 / 365 = 18 \text{ beds (for newborn babies)}$$

- Ⓒ The number of pediatric outpatients is estimated at 200 a day (annually 55,000). Statistics of MCHTI shows 5% of outpatients need to be hospitalized for five days on average,

$$60,000 \times 5 / 100 \times 5 \times 1 / 365 = 41 \text{ beds (for pediatrics)}$$

- Ⓓ The proposed annual number of deliveries is 3,000. Statistics of MCHTI shows 10% of deliveries are high risk and hospitalized for 30 days on average.

$$3,000 \times 10 / 100 \times 30 \times 1 / 365 = 24 \text{ beds (for gynecology)}$$

Assuming that the occupancy ratio of beds is 80 percent and the safety coefficient is 20 percent, then

$$(\text{a} + \text{b} + \text{c} + \text{d}) \times 1.2 \div 139$$

Thus, the minimum total number of beds is 139.

In light of the above results 200 beds for the main center and 150 beds for the sub center requested by the Bangladesh side are considered reasonable.

3) Operation/Delivery section

Rooms requested for operating theater, labour department and C.S.S.D. are all necessary.

4) Laboratory section

The hematology room shall include a blood bank. Image intensifier room, dark room and general X-ray rooms shall be deleted to correspond to the equipment procurement plan.

5) Administration service department

All the requested rooms for this department are considered necessary.

6) Training department

The auditorium shall be deleted since size of planned courses do not require such a large space. The size and number of classrooms shall be planned to correspond to the training plan.

(2) Equipment

Details of the requested items of equipment are examined on the basis of the technical maintenance capabilities of the MCHTI personnel, NEMEMW and local equipment agencies as well as spare parts supply condition in Bangladesh. Results of the examination are shown below.

1) Clinical service section

Dispensing equipment for the pharmacy shall be deleted since medicine will not be dispensed in MCHTI. All the other requested items are basic equipment for diagnosis and treatment and are therefore considered reasonable.

2) Inpatient section

Judging from the planned activities, personnel and technical level of MCHTI, ultrasonic nebulizer and fetal monitor are not considered necessary. Except for the above all are considered suitable. It is necessary, however, to reconsider or adjust the number of units to correspond to the numbers of hospital beds of the section at the main center and the sub center.

3) Operation/Delivery section

Since serious diseases are not treated at MCHTI and a referral system with other medical institutions has been established, advanced items such as fiberscope, defibrillator and infant ventilator should be deleted. Equipment for use during delivery and operations (including caesarean operations) shall be included. The number of units should be reconsidered or adjusted taking into account the functions of the operation/delivery section of the main center and the sub center.

4) Laboratory section

All of the requested examination equipment is indispensable for biochemical and hematological examinations as well as for a blood bank. However, manually operated equipment should take precedence over automatic equipment in consideration of future maintenance of the equipment.

5) Administration service department

Out of requested vehicles, only ambulance for transporting patients to the referral hospital and micro bus for transportation of trainees are considered necessary. The grade of personal computers should be those on which Bengali and English word processor software works. Other office machines and furniture

should be limited to those which are indispensable in operating the facilities. The number of units should be adjusted in light of activities in the department.

6) Training department

Advanced audiovisual equipment shall be deleted. Because necessity and appropriateness of them are not evident in terms of purpose of use, frequency of use and maintenance. A video monitor, slide projector, overhead projector and screen are considered necessary for conducting planned trainings.

3-2-6 Examination of the Necessity of Technical Cooperation

The project is going to be implemented in order to expand and improve the activities conducted at the existing MCHTI facilities. The project is not aimed at making dramatic changes in the activities of MCHTI. However, the necessity is imperative for sending Japanese experts in the area of MCH in view of the importance of ensuring the effective implementation of the clinical and training activities of the main center and determining the timing of the implementation of Phase II of the project. Phase II of the project shall be implemented after ensuring the smooth operation of the relaunched main center. Regarding the training of the FWVs and TBAs engaged in MCH/FP services in rural areas, assignment of Japan Overseas Cooperation Volunteers should be considered to educate and train TBAs on the basis of the actual needs of the residents of rural areas. It is also necessary to train in Japan the specialists of MCHTI in charge of operation of ultrasonic diagnosis equipment and delivery monitor equipment because the Bangladesh technical know-how on operation of these items of equipment is still insufficient.

3-2-7 Basic Policy of Japanese Grant Aid Assistance for the Project

As a result of the above examinations, it has been judged appropriate to implement the project in the form of grant aid assistance from the Government of Japan. However, it is concluded that the project shall be implemented in two phases. This is because the project, which is to improve both main and sub centers at the same time as is requested by the Bangladesh side, requires drastic increase of recurring cost and also necessitates large number of staff for operation. After the completion of Phase I, the improvement of the main center, if it is confirmed that the Bangladesh side secures the sufficient budget and recruits necessary personnel for the sub center as well as for the main center, Phase II of the project shall be implemented. As stated earlier, however, it is considered reasonable to modify part of the contents of the request in relation to the contents of the project.

3-3 Outline of the Project

3-3-1 Executing Agency and Management System

(1) Executing Agency

Directorate of Family Planning, the Ministry of Health and Family Welfare is responsible for the execution of the project. The post of the director/superintendent of MCHTI is equivalent to the director of the Directorate of Family Planning.

(2) Management System

Organization of MCHTI is as shown below.

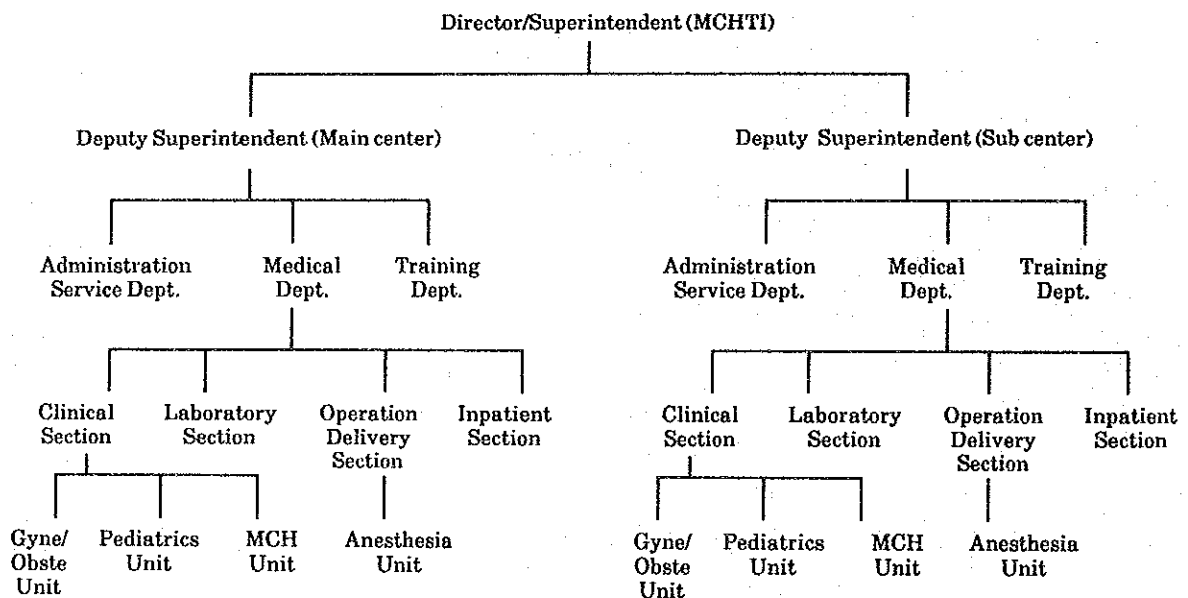


Fig. 3-2 Organization chart of MCHTI

(3) Personnel Plan

MCHTI will be operated with the personnel as shown in Table 3-3.

Table 3-3 Staff allocation of MCHTI

	Azimpur Main Center	Lalkuthi Sub Center	Total
Director/Superintendent	1	0	1
Deputy Superintendent	1	1	2

Administration Service Department

	Azimpur Main Center	Lalkuthi Sub Center	Total
Deputy Director	1	1	2
Asst. Director	1	1	2
Engineer	1	1	2
Administrative Officer	1	1	2
Statistician	1	1	2
Stenographer	2	1	3
Head Assistant	1	1	2
Accountant	1	1	2
Storekeeper	3	3	6
U.D. Assistant	1	1	2
Cashier	1	1	2
A/V Operator	1	1	2
Steward	1	1	2
Ward Mistress	2	0	2
Typist Cum Clerk	1	1	2
LDA Cum Typist	8	5	13
Record Keeper	1	1	2
Driver	6	6	12
House Keeper	0	1	1
Cook	6	5	11
Guard	15	12	27
Sweeper	33	31	64
Mali	1	0	1
MLSS	11	8	19
Cash Sharker	1	1	2
Total	101	86	187

Medical Department

	Azimpur Main Center	Lalkuthi Sub Center	Total
Sr. Consultant (Gyne/Obste)	2	1	3
Sr. Consultant (Pediatrics)	1	1	2
Sr. Consultant (Anesthesia)	1	1	2
Sr. Consultant (MCH)	1	1	2
Registrar / Asst. Registrar	4	4	8
Pediatrician	1	0	1
Medical Officer	11	12	18
Ultrasonogram Specialist	2	2	4
Asst. Surgeon	5	4	9
Pathologist	3	1	4
Blood Bank Officer	1	1	2
M.O. Clinical Instructor	1	1	2
Anesthetist	1	1	2
Sr. Matron	1	1	2
Medical Social Worker	1	1	2
Supervising Staff Nurse	6	5	11
O.T. Sister	8	5	13
Jr. Matron	2	1	3
Sr. Staff Nurse	14	14	28
Pharmacist	2	2	4
FWV	50	40	90
Lab. Assistant	1	1	2
Male Attendant	5	4	9
Ward Boy	4	4	8
Aya	42	34	76
Dai	9	0	9
Total	179	143	322

Training Department

	Azimpur Main Center	Lalkuthi Sub Center	Total
Training Coordinator	1	1	2
Medical Officer (Training)	3	3	6
Nutrition Officer	1	1	2
Sister Tutor	6	6	12
Total	11	11	22
Grand Total	293	240	533

1) Administration Service Department

One deputy director and one assistant director will supervise the department. The administrative officer will be responsible for general management and accounting as well as lower rank staff. The statistician who is in charge of statistics of MCHTI is positioned under the assistant director. The engineer is in charge of maintenance of the facilities and is also positioned under the assistant director.

2) Medical Department

At the clinical service section, FWVs will be responsible for basic treatment of patients. One or two medical officers stationed at each clinical unit will be responsible for diagnosis and treatment of only abnormal cases. Some nurses will also be stationed at each clinical unit to assist the medical officers and to supervise FWVs. At present, the pediatric unit and the obstetric/gynecology unit offer their respective clinical services on alternate days, but after the completion of the project, both units will offer their services every day. Both departments' service hours will be 8:00 a.m. to 2:00 p.m. One or two Sr. consultants will supervise each clinical unit combining outpatient and inpatient. At the inpatient section, medical officers, Sr. staff nurses, FWVs and Ayas work in three shifts of eight hours as shown in the Table 3-4.

Table 3-4 Three-Shift system at the inpatient section

	Azimpur · Main center		Lalkuthi · Sub center	
	Positioning	Nos. of staff	Positioning	Nos. of staff
Medical Officer	1 for each of obste., gyne., and new born/ pediatrics	3×3Times=9	1 for each of obste., gyne., and new born/ pediatrics.	3×3Times=9
Sr. staff Nurse	3 for obste., 2 for gyne.	5×3Times=15	3 for obste., 2 for gyne.	5×3Times=15
FWV	5 for obste., 2 for new born, 2 for gyne. 3 for pediatrics	12×3Times=36	4 for obste, 2 for new born, 2 for gyne, 2 for pediatrics	10×3Times=30
Aya	4 for obste., 4 for pediatrics, 6 for gyne/ new born	14×3Times=42	4 for obste., 4 for pediatrics, 5 for gyne./ new born	13×3Times=39
Total Nos. of staff engaged in three-shift		102		93

3) The training Department

The training coordinator is responsible for this department. Three medical officers, and one nutrition officer are in charge of training paramedics such as FWVs. Training for medical students shall be given only by qualified Sr. consultants.

3-3-2 Activity Plan

The contents of specific activities at MCHTI are as described below.

(1) Medical department

1) Clinical service section

At the obstetric/gynecology unit, medical examinations and maternity classes are conducted. The examination items include weight, blood pressure, urine, uterus bottom length, presentation, and fetal heart beat. At the maternity class, daily care guidance such as nutrition and daily antenatal care, and also family planning are instructed. In the maternity class, the history of childbirth, number of children, and desired method of family planning for each mother is recorded. These records are used in guidance on family planning. The main tasks of the pediatric department are immunization and treatments of non-serious infectious diseases.

2) Inpatient section

At this section, obstetric/gynecology and pediatric inpatients are treated. The obstetric wards will accept annually 5000 and 3000 deliveries at the main center and the sub center respectively. The gynecology wards will accept 500 and 300 cases such as high risk pregnancies annually at the main center and the sub center respectively. In principle, MCHTI accepts only those cases which do not require advanced diagnosis or treatment, and therefore mainly delivery-related cases are treated at the obstetric/gynecology ward. Length of hospitalization is two to five days in

the case of normal delivery and seven to ten days in the case of caesarian operation. Charged bed rooms shall be provided in the same way as the present condition.

3) Laboratory section

At present, biochemical and hematological examinations are conducted outside examination agencies. This inconveniences the medical activities of MCHTI due to the delay in obtaining examination results. In the project, laboratory section will be strengthened so as to conduct basic examinations. Basic examinations include hematological one for hemoglobin, blood type, and PH antibodies. And biochemical ones, such as serum bilirubin level measurement, blood sugar level measurement and uric acid level measurement. In order to improve the supply of blood, a blood bank will be provided in the hematology laboratory so that blood can be collected from relatives of the patients.

4) Operation/delivery section

Operations performed at this section are mainly sterilization (oviduct ligature), menstrual regulation and Caesarean operation.

(2) Training division

The contents and scale of the present training program will remain unchanged at the main center. Therefore, training shall be conducted for 720 trainees such as medical students, FWVs and TBAs etc.

Table 3-5 shows a training schedule and a estimated number of trainees for each training course.

Future training programs are being developed and the number of trainees accepted by MCHTI will be increased to double the current number. For this purpose, a high level management committee has been established to coordinate with NIPORT, NIPSOM and other MCH/FP related institutes. The future expansion of training will be handled at the sub center.

Table 3-5 Training schedule at the main center

	Trainee	Duration of course											Total	Remarks	
		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.			Mar.
1	Senior FWV, FWV refresher course		2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days	2days ~ 15days		NIPORT FWVTI
	Nos. of trainee		20	20	20	20	20	20	20	20	20	20	20	220	11 groups
2	FWV Refresher course		15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days	15days ~ 30days		ditto
	Nos. of trainee		20	20	20	20	20	20	20	20	20	20	20	220	11 groups
3	FWV Basic course	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days	1day ~ 15days		ditto
	Nos. of trainee	20	20	20	20	20	20	20	20	20	20	20	20	40	2 groups
4	4th year student nurse (Midwifery)		1day ~ 21days	1day ~ 21days											College of Nursing
	Nos. of trainee		40	40										80	2 groups
5	Sr. staff Nurse	1day ~ 21days				1day ~ 21days									School of Nursing
	Nos. of trainee	20				20								40	2 groups
6	Medical students			1day ~ 21days	1day ~ 21days										NIPSOM
	Nos. of trainee			40 40	40 40									80	2 groups
7	Upazila Medical Officer					1day ~ 30days	1day ~ 30days	1day ~ 30days	1day ~ 30days	1day ~ 30days	1day ~ 30days	1day ~ 30days	1day ~ 30days		Bangladesh Rural Advancement committee
	Nos. of trainee					10	10	10	10	10	10	10	10	10	1 groups
8	TBA		1day ~ 21days	1day ~ 21days											NGO organization
	Nos. of trainee		15	15										30	2 groups
	Grand Total													720	

Contents of the training courses are described as below:

1) FWV Basic course

To obtain a qualification of FWV, it is necessary to complete a one and a half year training course at one of 12 FWVTIs which are located nation wide. The training program of FWVTI consists of three courses - theory, practice I, and practice II. The period for completion of theory, practice I and practice II is 6 months, 8 months and 3 months respectively. At MCHTI, training required in the practice I course will be conducted for a duration of one month. Trainees are divided into groups, each group consists of approximately five trainees, to receive clinical training regarding birth assistance and family planning.

2) FWV Refresher course

Trainees are selected from FWVs on the active list. Since those trainees have already obtained practical experience, training of institutional deliveries are given placing emphasis on antenatal and postnatal care.

3) Medical students training

Medical students in the diploma course of MCH at NIPSOM (which has seven diploma courses), attend one week training course at MCHTI. Since the training level of the course is high, instructor of MCHTI for the course are limited to qualified Sr. consultants. Contents of the course are obstetric and pediatric examinations, treatments of emergency cases of pregnancy and menstrual regulations etc.

(3) Administration service department

Administration of personnel affairs, accounting and medical records management will be controlled by this department.

3-3-3 Location and Present State of the Project Site

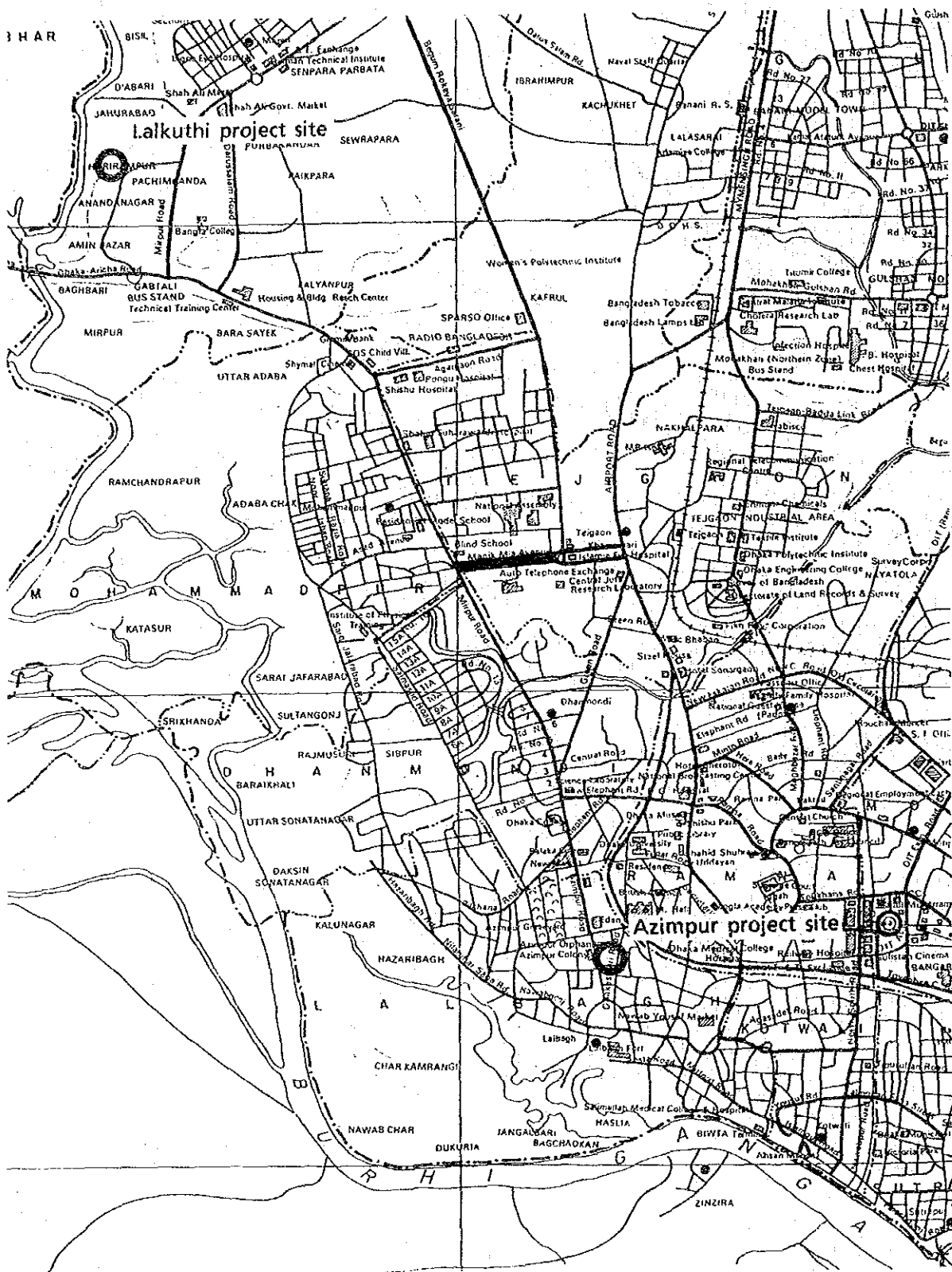


Fig. 3-3 Proposed project site

(1) Azimpur Main Center

1) Location of the Project Site

The proposed project site for the Azimpur main center is owned by the Ministry of Health and Family Welfare and is located in Azimpur in the southern part of Dhaka. This area belongs to the old part of the city and has many multi story buildings.

2) Present state of the project site

The project site faces Azimpur road on the west and the access road to the Directorate of Family Planning building on the south. The shape of the site is trapezoidal with an area of 2,990 m². Since the site area is small, it is necessary to make full use of the maximum building area permitted under the building regulations to construct the new facilities. Therefore, the remaining open space will be very limited. For this reason, place for the material stock yard and the site office needs to be secured outside of the project site while construction work is underway.

At present, MCHTI is operated in the three-storied reinforced concrete inpatient building and the two-storied reinforced concrete outpatient building. The two buildings must be demolished and removed prior to the start of the construction of the new facilities. Since the sewer pipe from the Directorate of Family Planning building passes the project site, it is necessary to relocate the pipe in advance of construction work.

3) Infrastructure of the surrounding area

• Electricity

An 11kV overhead power line runs along the Azimpur road which the project site faces on the west side, to which a service wire shall be connected. Although power failures occurs only

once or twice a month, it is necessary to install a power generator in order to ensure uninterrupted operation at the medical facilities. It is also necessary to install an automatic voltage regulator for the operation of some equipment since the voltage varies widely around the project site.

- Telephone

At present two T & T Board terminal boxes are installed on Azimpur road just across the site. Therefore, it will not be a problem to intake new telephone lines from one of these terminal boxes. Presently three lines are being used at the existing main center building.

- Water supply

Two DWASA water mains, one with a diameter of 150mm and the other 300mm, are laid along Azimpur road.

Water supply to the main center shall be connected to the 150mm water main which is closer to the site. The water supply around the project site is insufficient and is cut off regularly. For this reason, the water reservoir of the main center shall be large.

- Sewage

A DWASA sewer pipe with a diameter of 300mm is laid along Azimpur road. It is possible to discharge waste water from the main center into this pipe. Rainwater can be discharged into the side ditch running along Azimpur road.

- City gas

A gas main pipe with a diameter of 50mm of TITAS GAS is laid along the access road to the Directorate of the Family Planning building, which the site faces on the south side. A service pipe is to be connected to the gas main.

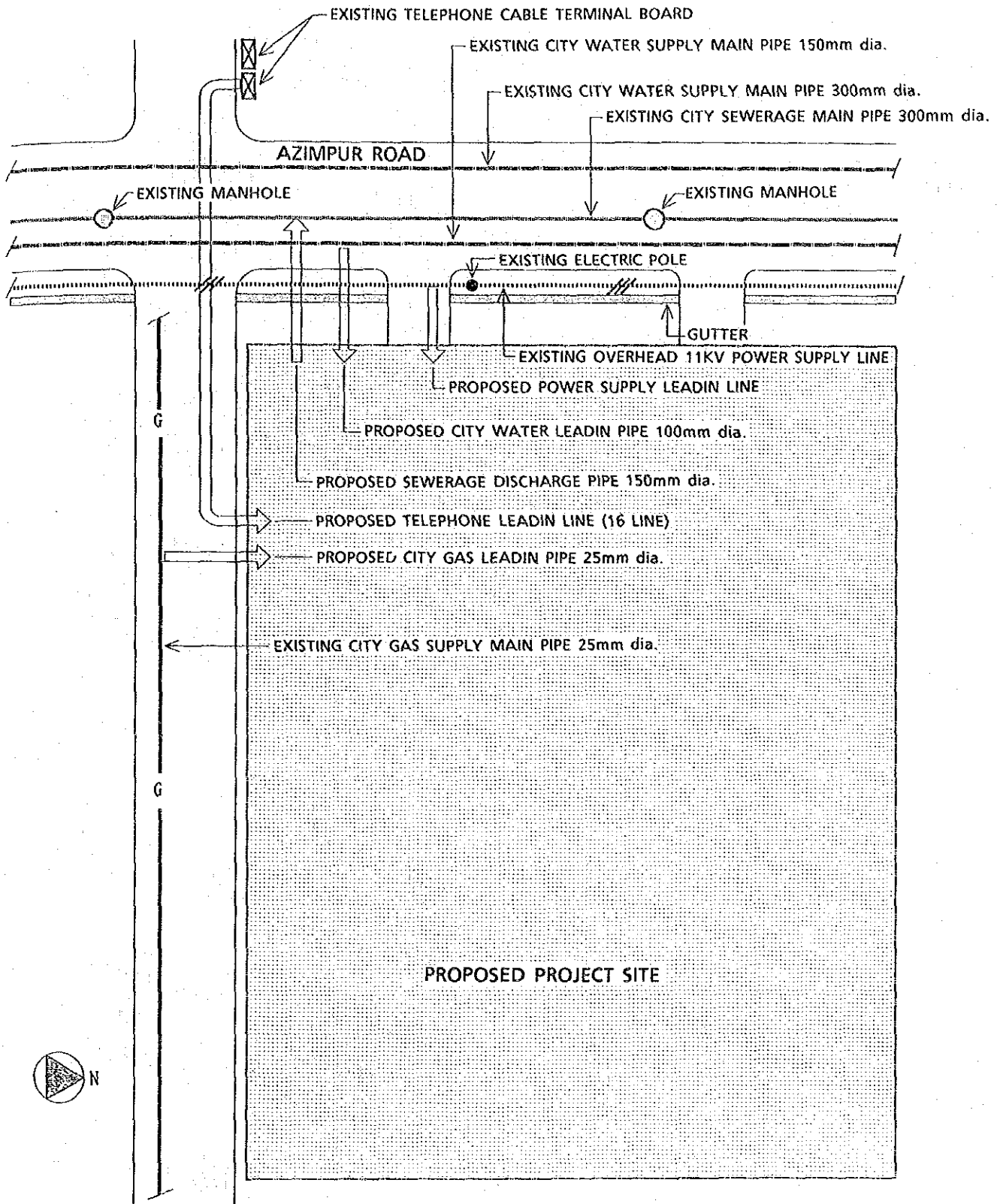


Fig. 3-4. Infrastructure around the Azimpur project site

(2) Lalkuthi Sub center

1) Location of the project site

The proposed project site for the Lalkuthi Sub center is owned by the Ministry of Health and Family Welfare and is located in Mirpur in the western part of the city of Dhaka. It is about 10km away from the Azimpur main center. This area has developed as a new residential section of the city.

The project site is located about 200 meters west of Mirpur road. Access to the site is via a concrete paved road with a width of about eight meters.

2) Present state of the project site

The shape of the project site is rectangular with an area of 4,125m². It faces brick roads with a width of about 4 meters on the west and north, and a concrete road leading to the Mirpur road on the south. The ground level of the site is lower than the road around it. Therefore, rain water will remain and form a pool at the eastern end of the site which is the lowest part of the site. It is necessary, therefore, to raise the ground level before construction of the new facilities.

The existing outpatient building, inpatient building and lodging house for the staff members must be demolished and removed before the start of the construction of the new facilities.

3) Infrastructure of the surrounding area

• Electricity

An 11kV overhead power line runs along the road on the southern side of the project site, to which a service wire shall be

connected. The frequency of power failures and voltage fluctuations is almost the same as the main center, and therefore it is necessary to install a power generator and an automatic voltage regulator in order to ensure uninterrupted operation at the medical facilities.

- Telephone

One T & T Board terminal box is installed on the access road from Mirpur road, to which a lead-in wire can be connected. Presently one telephone line is being used at the existing facility.

- Water supply

A water main with a diameter of 150mm is laid along the roads on the south and east sides of the project site. Water supply to the sub center can be connected to the water main. Since water supply around the area is cut off regularly, (as is the case of the main center), the water reservoir shall be large.

- Sewage

There are no public sewer pipes laid around the project site. Sewage is to be treated in a septic tank and then made to sink into the ground. Rainwater can be discharged into the side ditches running around the project site.

- City gas

A gas main with a diameter of 50mm of TITAS GAS is laid along the roads on the south, east and west sides of the project site. A service pipe can be connected to one of these gas mains.

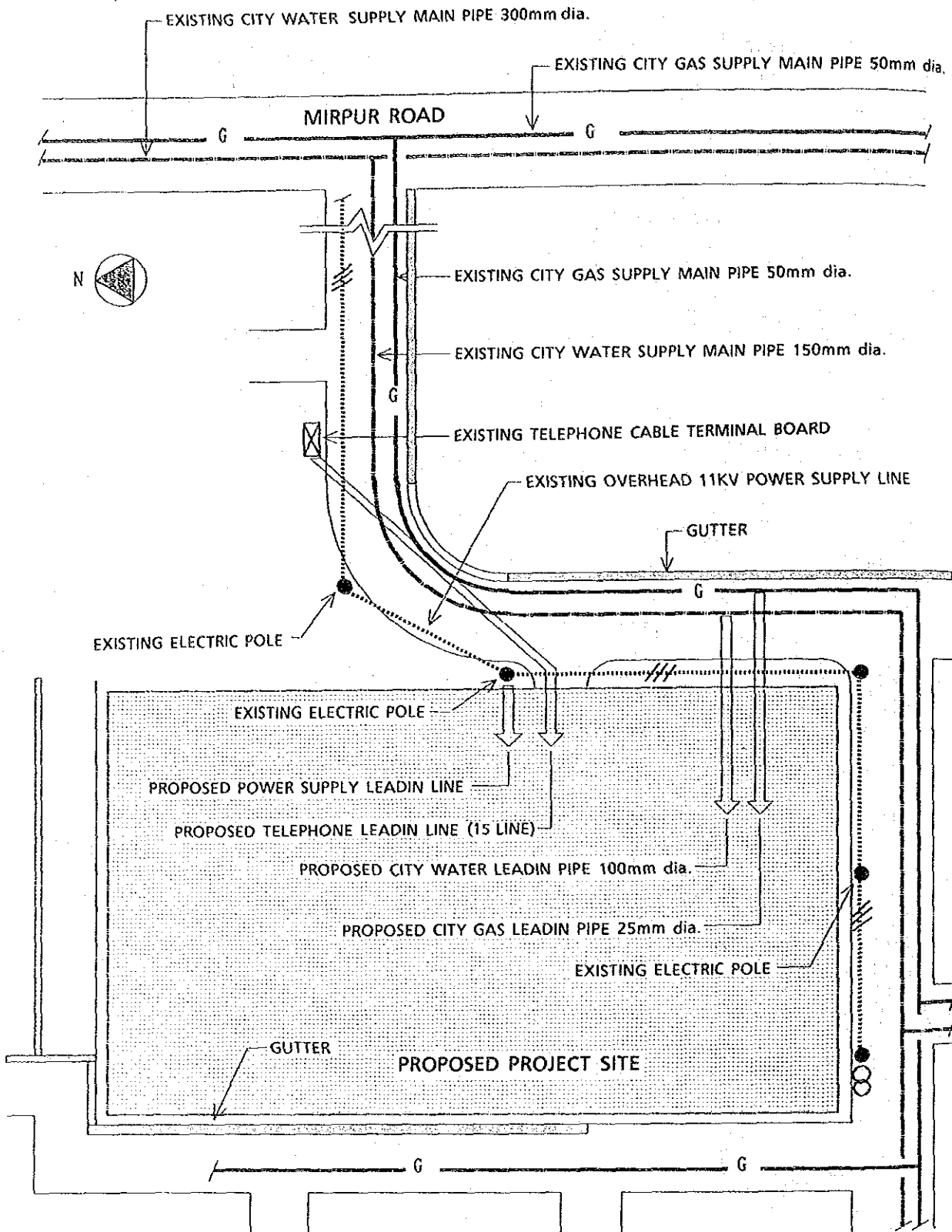


Fig. 3-5 Infrastructure around the Lalkuthi project site

3-3-4 Outline of the Facilities and Equipment

Shown below is the outline of the facilities and equipment which are considered reasonable for inclusion in the project based on the results of "3-2 Examination of the Contents of the Request".

(1) Facilities

1) Azimpur Main center (6605m²)

- Clinical Service Section (954m²)
Examination room, Treatment room, Maternity classroom, Pharmacy, Medical record room, Immunization room etc.
- Inpatient Section (2901m²)
Obstetrics ward (6-bed room, 4-bed room, 2-bed room), Gynecology ward (6-bed room, 2-bed room), New born baby room, Pediatrics ward (60bed room, 2-bed room), Nurse station, Medical officers' room, Treatment room, Linen room, Waste disposal room, Attendant room etc.
- Operation/Delivery Section (566m²)
Labour room, Delivery room, Operation theater, C.S.S. room, Recording office, Nurse station, Preparation room etc.
- Laboratory Section (126m²)
General lab., Toilet, Hematology lab., Ultrasonograph room etc.
- Administration/Service Department (1042m²)
Director room, Deputy Superintendent room, Senior Consultant room, Administration office, Account office, Conference room, Electrical room, Pump room, Generator room, Kitchen etc.
- Training Department (245m²)
Lecture room etc.
- Miscellaneous public space (771m²)

2) Lalkuthi Sub center (6364m²)

- Clinical Service Section (822m²)
Examination room, Treatment room, Maternity classroom, Pharmacy, Medical record room, Immunization room etc.
- Inpatient Section (2520m²)
Obstetrics ward (6-bed room, 2-bed room), Gynecology ward (6-bed room, 2-bed room), New born lab room, Pediatrics ward (6-bed room, 2-bed room), Nurse station, Medical officers' room, Treatment room, Linen room, Waste disposal room, Attendant room etc.
- Operation/Delivery Section (531m²)
Labour room, Delivery room, Operating theater, O.T. all, C.S.S. room, Recording office, Nurse station, Preparation room etc.
- Laboratory Section (108m²)
General lab., Hematology lab., Ultrasonograph room etc.
- Administration/Service Department (973m²)
Deputy superintendent room, Senior Consultant room, Administration office, Account office, Conference room, Electrical room, Pump room, Generator room, Kitchen etc.
- Training Department (791m²)
Lecture room, Dormitory etc.
- Miscellaneous public space (619 m²)

(2) Equipment

1) Azimpur Main center

- Clinical Service Section
Obstetrical diagnostic unit, Examining table, Examining light, Gynecological instrument set, Pediatric surgical instrument set, Diathermy unit, Suction unit, Instrument trolley, Boiling

sterilizer, Height scale, Weighing scale, Stethoscope, Fetal detector, etc.

- Inpatient Section

Bed, Neonatal bed, Step, Instrument cabinet, Film illuminator, Nurse table, Instrument set, Chart carriage, Work table, Oxygen inhaler, Wash basin stand, Steam sterilizer, Fetal detector, Instrument cabinet, Refrigerator, etc.

- Operation/Delivery Section

Surgical instrument set, Operating table, Manual resuscitator, Shadowless lamp, Portable infant incubator, Suction unit, Anesthetic machine, Stretcher, Instrument wagon, Fetal weighing scale, Fetal detector, Work table, etc.

- Laboratory Section

Calorimeter, General purpose centrifuge, Microscope, Incubator, Water bath, Water distiller, Spectrophotometer, Steam sterilizer, Refrigerator, Blood bank refrigerator, Table for blood collection, Titrator, Glassware, Ultrasonic diagnostic unit, Examining table, etc.

- Administration/Service Department

Storage cabinet, Locker, Desk, Chair, Conference table, Notice board, Photocopier, Typewriter, Personal computer, Ambulance, Microbus, etc.

- Training Department

Overhead projector, Storage cabinet, Screen, Slide film projector, Video deck, Monitor TV, Notice board Pregnancy models, Human body models, etc.

2) Lalkuthi Sub center

- Clinical Service Section

Obstetrical diagnostic unit, Examining table, Examining light, Gynecological instrument set, Pediatric surgical instrument set, Diathermy unit, Suction unit, Instrument trolley, Boiling

sterilizer, Height scale, Weighing scale, Stethoscope, Fetal detector, etc.

- Inpatient Section

Bed, Neonatal bed, Step, Instrument cabinet, Film illuminator, Nurse table, Instrument set, Chart carriage, Work table, Oxygen inhaler, Wash basin stand, Steam sterilizer, Fetal detector, Instrument cabinet, Refrigerator, etc.

- Operation/Delivery Section

Surgical instrument set, Operating table, Manual resuscitator, Shadowless lamp, Portable infant incubator, Suction unit, Anesthetic machine, Stretcher, Instrument wagon, Fetal weighing scale, Fetal detector, Work table, etc.

- Laboratory Section

Calorimeter, General purpose centrifuge, Microscope, Incubator, Water bath, Water distiller, Spectrophotometer, Steam sterilizer, Refrigerator, Blood bank refrigerator, Table for blood collection, Titrator, Glassware, Ultrasonic diagnostic unit, Examining table etc.

- Administration/Service Department

Storage cabinet, Locker, Desk, Chair, Conference table, Notice board, Photocopier, Typewriter, Personal computer, Ambulance, Microbus, etc.

- Training Department

Overhead projector, Storage cabinet, Screen, Slide film projector, Video deck, Monitor TV, Notice board, Pregnancy models, Human body models, Bed for dormitory, etc.

3-3-5 Maintenance and Operation Plan

(1) The personnel plan and the budget

In implementing the project, the Bangladesh side is planning to recruit 293 staff for the main center and 240 staff for the sub

center.

Positions in the Ministry of Health and Family Welfare are classified into four classes. Salary base is classified in 20 ranks. Personnel authority varies depending upon each position. Table 3-6 gives an outline of the basic salary structure.

Table 3-6 Salary Structure

Class	Positions	Salary Rank	Basic Salary	Personnel Authority
I	Superintendent, Dy. Superintendent	4	7,100 TK	Ministry of Health and Family Welfare
	Sr. Consultant	6	4,800 TK	
	Asst. Surgeon, Pediatrician, Medical officer, Anesthetist, Pathologist	8	3,200 TK	
	Medical social worker, Nutrition officer, Engineer	9	2,850 TK	
II	Administrative officer, Jr. Matron	10	2,300 TK	Director General
III	Sister tutor, O.T. sister	10	2,300 TK	Director/ Superintendent
	Pharmacist, Sr. staff nurse	11	1,725 TK	
	Accountant, Stenographer	13	1,475 TK	
	Steward, Lab. assistant, Storekeeper, LDA cum clerk, Cashier, FWV	14	1,375 TK	
	Driver	15	1,300 TK	
	House keeper, Typist cum clerk, LDA cum typist	16	1,200 TK	
IV	Cook	19	975 TK	
	Male attendant, Guard, Sweeper, Aya, Mali, MLSS	20	900 TK	

(2) Maintenance and operation

Upon designing facilities, special attention shall be placed on air conditioned areas and utilization of natural lighting and ventilation in order to minimize utility costs. Since elevators require maintenance and operation costs, no elevators will be provided. However, a shaft will be constructed under the project so that an elevator can be added to each facility in the future.

The engineer must be familiar with the facilities so that maintenance and repairs can be fulfilled properly. Since the facilities belong to the government property, Public Works Department (PWD) will be responsible for repair. And the engineer has to be responsible for troubleshooting and report to PWD. Therefore, it is essential to

recruit the engineer who will be responsible for the maintenance in advance to enable him to obtain sufficient knowledge while the facilities are being constructed.

In selecting types of equipment, the emphasis should be placed on easy maintenance in consideration of present equipment level of MCHTI, maintenance system and personnel, operation costs and technical maintenance level of local equipment supplier. The criterion for selection of sophisticated equipment such as ultrasonograph and high pressure steam sterilizer is whether the equipment manufacturer has an agent or a subsidiary in Bangladesh which is well provided with maintenance system.

Most equipment procured under the project are simple and can be repaired by the maintenance staff of MCHTI or at NEMEMW which is the maintenance workshop of the Ministry of Health and Family Welfare. Therefore, the following information shall be transmitted to the maintenance personnel before the equipment is turned over to the Bangladesh side so that they acquire adequate knowledge for maintenance:

- Method of routine maintenance (cleaning and adjustment)
- Method of operation and maintenance (simple troubleshooting)
- Method of managing the stock of expendable spare parts
- Method of managing the stock of operation manuals

Following chart shows maintenance organization for facilities and equipment of MCHTI.

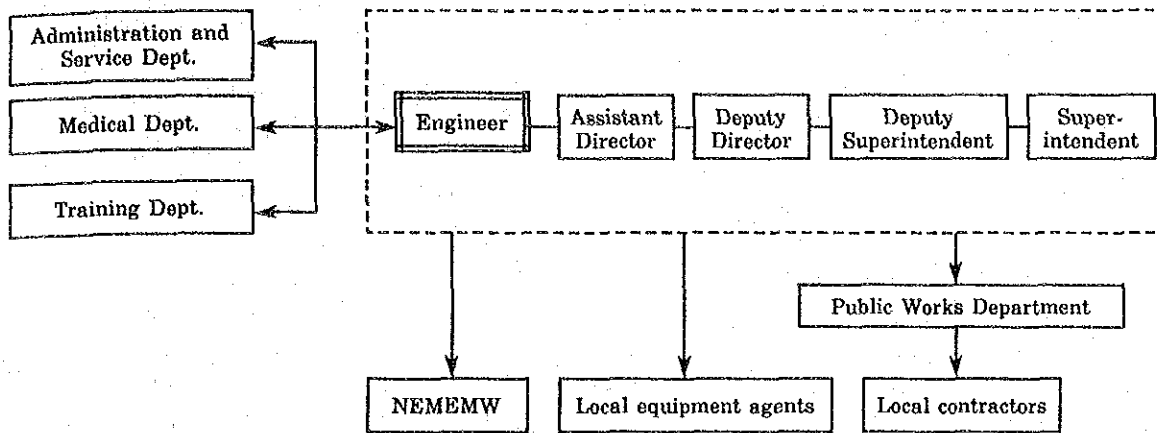


Fig. 3-6 Maintenance organization

The engineer is responsible for troubleshooting of facilities and equipment. He will conduct periodical inspection and also collect information about troubles of facilities and equipment from the Administration and Service Dept., the Medical Dept. and the Training Dept. All the troubles will be recorded in daily, weekly and monthly report by the engineer for consideration by the maintenance committee which consists of the assistant director, the deputy director, the deputy superintendent and the superintendent. Maintenance and repairment will be ordered upon approval by the maintenance committee with issuance of budget.

Repair of equipment will be ordered to NEMEMW or local equipment agents depending upon types of equipment. Maintenance of facilities will be ordered directly to local contractors or through the Public Works Department depending upon type and quantity of each work.

(3) Operational costs

Operational costs of MCHTI are roughly classified into personnel expenses, consumable expenses and general expenses. Annual operation costs of MCHTI are estimated as shown below.

Table 3-7 Operational costs

(Unit: TK)

	1991/1992
Personnel expenses	7,660,049
Consumable expenses	1,411,062
Medical contingency	745,847
Diet	524,109
Other contingency	141,106
General expenses	1,007,901
Utility and telephone charges	497,903
Water charge	10,079
Electricity charge	212,667
Gas charge	93,735
Medical gas charge	62,490
Telephone charge	118,932
Other	509,998
Total	10,079,012

The personnel expenses occupy a considerable part of the entire operational costs (76 percent). This is because medical consumable expenses is low due to the nature of MCHTI as an institution in which obstetric/gynecology department is the main field of activities.

Therefore, this cost trend will remain unchanged after the completion of the project.

Operational costs upon completion of Phase I and Phase II are estimated as shown below.

Table 3-8 Estimate results and operation costs

(Unit: TK)

	Upon completion of Phase I Main center	Upon completion of Phase II	
		Main center	Sub center
Personnel expenses	14,589,095	16,066,958	10,605,510
Consumable expenses	2,687,465	2,959,703	1,953,647
Medical contingency	1,322,290	1,456,236	870,902
Diet	1,115,013	1,227,962	917,979
Other contingency	250,163	275,504	164,765
General expenses	2,631,000	2,908,590	2,271,000
Utility and telephone charge	1,752,000	1,936,849	1,565,000
Water charge	130,000	143,716	53,000
Electricity charge	1,100,000	1,216,058	1,000,000
Gas charge	130,000	143,716	120,000
Medical gas charge	140,000	154,771	140,000
Telephone charge	252,000	278,588	252,000
Other (bulbs etc., repairment)	1,495,000	1,652,741	1,355,000
Total	20,523,560	22,616,251	15,479,916
Grand total	20,523,560	38,096,167	

1) Personnel expenses

The total amount of salaries of 293 staff members at the main center and 240 staff members at the sub center is calculated on the basis of the salary structure as shown in Table 3-6. The prescribed rates of salary increase are taken into account, but future changes in these salary increase rates are not considered.

2) Consumable expenses

The total amount of consumable expenses is calculated on the basis of the present consumable expenses and future increase in the number of outpatients as well as inpatients. Cost escalation is considered at the same rate as that of personnel expenses.

Azimpur Main Center

① Medical Contingency

The rate of increase of outpatient and the number of delivery is 5/3.

$$745,847 \times 5/3 = 1,243,078 \text{ TK/year}$$

② Diet

The rate of increase of hospital beds is 200/100.

$$524,109 \times 200/100 = 1,048,218 \text{ TK/year}$$

③ Other Contingency

The rate of increase of outpatient and the number of delivery is 5/3.

$$141,106 \times 5/3 = 235,177 \text{ TK/year}$$

Lalkuthi Sub center

① Medical Contingency

The number of outpatient & delivery are equivalent to that of the existing main center.

$$745,847 \text{ TK/year}$$

② Diet

The rate of increase against the existing bed in the main center is 150/100.

$$524,109 \times 150/100 = 786,164 \text{ TK/year}$$

③ Other Contingency

The number of outpatient & delivery are equivalent to that of the existing main center.

$$141,106 \text{ TK/year}$$

3) General expenses

Since the tentative calculation of general expenses as shown below is based on the 1991 tariffs, an annual price increase rate of 3.4 percent should be taken into account in estimating future general expenses.

Azimpur Main Center

① Electricity charge

a. Estimate of equipment capacity

• Lighting fixtures/wall sockets:	$30\text{w/m}^2 \times 6,600 \text{ m}^2$	=	198 kW
• Air conditioners (15% of floor area):	$(6,600\text{m}^2 \times 0.15 \times 200\text{kcal/h} \cdot \text{m}^2) + (860\text{kcal/h} \times 2.5)$	=	92 kW
• Ventilation system:	$5\text{W/m}^2 \times 6,600 \text{ m}^2$	=	33 kW
• Sanitary equipment:	$5\text{W/m}^2 \times 6,600\text{m}^2$	=	33kW
• Medical equipment:			50kW
• Others (10% of the total for the above items):	$460\text{kW} \times 0.10$	=	41 kW
		Total	447 kW

b. Estimate of electricity charge

- Number of days of use of facilities per monthly 30days/month
- Number of hours of use of facilities per day 18hours/day

- Daily rate of demand 0.15
- Tariff 2,35TK/kW
- Annual electricity charges
 $447\text{kW} \times 30\text{days/month} \times 18\text{hours/day} \times 0.15 \times 2.35\text{TK/kW} \times 12\text{months/year}$
 $= 1,021,037 \text{ TK/year}$
 $\div 1,100,000\text{TK/year}$

② Telephone charge

It is assumed that future monthly average telephone use will be increased three times since the number of officers will be increased by three times.

$$7,000\text{TK/month} \times 3 \times 12\text{months/year} = 252,000 \text{ TK/year}$$

③ Water charges

a. Water consumption

Water consumption per bed at local hospitals is 200ℓ

$$200\text{beds} \times 200\ell/\text{beds} \cdot \text{day} = 40,000 \ell/\text{day}$$

Water consumption per person at local offices is 120ℓ

$$293 \times 120\ell/\text{people} = 35,160 \ell/\text{day}$$

Other (20% of the total for the above items) = 15,032 ℓ/day

$$\text{Total } 90,192 \ell/\text{day}$$

$$\div 90\text{m}^3/\text{day}$$

b. Estimate of water/sewage charges (the sewage tariff is the same as the water tariff)

- Monthly water consumption 90m³/month
- Number of days of use of facilities per monthly 30day/month
- Monthly rate of demand 0.7
- Tariff 2.76 TK/m³
- Annual water/sewage charge
 $90 \text{ m}^3/\text{day} \times 30\text{day/month} \times 0.7 \times 12\text{months/year} = 22,680 \text{ m}^3/\text{year}$
 $22,680\text{m}^3/\text{year} \times 2.76\text{TK/m}^3 \times 2 = 125,194 \text{ TK/year}$
Total 130,000 TK/year

④ City gas charge

a. City gas consumption

At the existing facility, cooking of ward meal requires 1000 kcal/meal in average.

Hospital beds

$$200\text{beds} \times 3\text{meals} \times 1,000\text{kcal/meal} = 600,000 \text{ kcal/day}$$

$$\text{Others} \quad 5,000\text{kcal/h} \cdot \text{No} \times 15\text{Nos} \times 3\text{h/day} = 225,000 \text{ kcal/day}$$

$$\text{Total} \quad \quad \quad 825,000 \text{ kcal/day}$$

b. Calculation of city gas charge

- Daily city gas consumption 825,000 kcal/day
- Number of days of use of facilities per monthly 30days/month
- Monthly rate of demand 0.9
- City gas calorific value 9,255kcal/m³
- Tariff 4.46 TK/m³
- Annual city gas charges
(825,000kcal/day × 0.9 × 30days/month × 12months/year × 4.46TK/m³)
+9,255 kcal/m³ = 128,812 TK/year
÷ 130,000 TK/year

⑤ Medical Gas Charge

In consideration of increase in MR and caesarean operation etc., future consumption will be three times as large as those for the existing facilities

- Medical gas consumption

O ₂	130 m ³ /day
N ₂ O	15 kl/day
- Medical gas charge

O ₂	40 TK/m ³
N ₂ O	420 TK/m ³
- Monthly medical gas charge
(130m³ × 40TK/m³ + 15kl × 420TK/Kl) × 12month/year
= 138,000 TK/year
÷ 140,000 TK/year

Lalkuthi Sub Center

① Electricity charges

a. Estimate equipment capacity

- Lighting fixtures/wall sockets: $30W/m^2 \times 6,400 m^2 = 192 kW$
 - Air conditioners (15% of floor area):
 $(6,400m^2 \times 0.15 \times 200kal/h \cdot m^2) + (860kal/h \times 2.5) = 89 kW$
 - Ventilation system: $5W/m^2 \times 6,400 m^2 = 32 kW$
 - Sanitary equipment: $5W/m^2 \times 6,400m^2 = 32 kW$
 - Medical equipment: 50 kW
 - Other (10% of the total for the above items):
 $460kw \times 0.10 = 41 kW$
- Total 435 kW

b. Estimate of electricity charges

- Number of day of use of facilities per monthly 30days/month
- Number of hours of use of facilities per daily 18hours/day
- Daily rate of demand 0.15
- Tariff 2,35TK/kW
- Annual electricity charges
 $435kW \times 30days/month \times 18hours/day \times 0.15 \times 2.35TK/kW \times 12months/year$
 $= 993,627 TK/year$
 $\div 1,000,000 TK/year$

② Telephone charge

Number of officers will be almost 90% of that of the main center.

$$7,000TK/month \times 3 \times 0.9 \times 12months/year = 226,800 TK/year$$

③ Water charges

a. Water consumption

Water consumption per bed at local hospitals is 200ℓ.

$$150beds \times 200\ell/beds \cdot day = 30,000 \ell/day$$

Water consumption per person at local offices is 120ℓ.

Staff members	240people×120L/people	= 28,800 ℓ/day
Trainee	40people×0.75×120ℓ/person	= 3,600 ℓ/day
Other		=12,480 ℓ/day
(20% of the total for the above items)		
		Total 74,880 ℓ/day
		÷ 75 m ³ /day

b. Calculation of water/sewage charges (the sewage tariff is the same as the water tariff)

• Monthly water consumption	75m ³ /month
• Monthly number of days of use of facilities	30days/month
• Monthly rate of demand	0.7
• Tariff	2.76 TK/m ³
• Annual water/sewage charges	
75 m ³ /day×30day/month×0.7×12month/year	= 18,900 m ³ /year
18,900m ³ /year×2.76TK/m ³ ×2	= 52,164 TK/year
	÷ 53,000 TK/year

④ City gas charges

a. City gas consumption

At the existing facility, cooking of ward meal requires 1000 kcal/meal in average.

Hospital beds

150beds×3meals×1,000kcal/meal	= 450,000 kcal/day
Other 5,000kcal/h·No×15Nos×3h/day	= 225,000 kcal/day
Trainees 40trainees×0.75×3meal×1,000kcal/meal	= 90,000 kcal/day
Total 765,000 kcal/day	

b. Calculation of city gas charges

• Daily city gas consumption	765,000 kcal/day
• Monthly number of days of use facilities	30days/month
• Monthly rate of demand	0.9
• City gas city calorific value	9,255kcal/m ³
• Tariff	4.46 TK/m ³
• Annual city gas charges	
(765,000kcal/day×0.9×30day/month×12month/year×4.46TK/m ³)÷11	

9,444kcal/m³

≐ 120,000 TK/year

⑥ Gas for medical use

Consumption will be almost same as that of the main center.

- Medical Gas Consumption O₂ 130 m³/day
N₂O 15 kℓ/day
- Medical Gas Charge O₂ 130 m³/day
N₂O 420 TK/m³
- Monthly medical gas charges
(130m³×40TK/m³+15kℓ×420TK/Kℓ)×12month/year
= 138,000 TK/year
≐ 140,000 TK/year

CHAPTER 4 BASIC DESIGN

CHAPTER 4 BASIC DESIGN

4-1 Design Policies

The facility and equipment plans are to be worked out taking into consideration Bangladesh natural and social conditions as well as the present state of the implementing organization of the project.

(1) Design policy relating to natural conditions

Bangladesh is situated on the Indian Subcontinent, at 20°34' to 36° 36' north latitudes and 88° 1' to 92° 41' east longitudes. The mountainous region in the southeastern part of the country borders on Myanmar, and all of its eastern, northern and western parts border on India. Eighty-five percent of the country's land area is a plain of alluvia soil, where the country's seven large rivers Padma, Meghna, Jamuna, Brahmaputra, Teesta, Surma, Karnaphuli and their 230 tributaries flow. The country has a typical tropical rain forest climate which is affected by the monsoons from the Indian Ocean. It has three seasons - winter (November to December), summer (March to May) and the rainy season (June to October). Its annual average temperature is 10°C to 34°C and its annual rainfall ranges between 1,194mm and 3,454mm. During the rainy season, there are many heavy rainfalls accompanied by tropical gales.

Table 4-1 Weather of Dhaka City

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum	12.5	13.2	18.0	23.0	25.1	25.5	25.5	25.3	25.1	23.5	17.5	13.5
Maximum	25.1	27.5	30.2	35.1	33.5	32.0	30.5	31.5	31.3	31.0	28.5	26.5
Average	18.6	20.7	25.7	29.3	29.6	28.8	28.4	28.6	28.5	27.3	23.1	19.5
Sunshine Hour	272.8	254.8	275.9	264.0	257.3	147.0	161.2	179.8	183.0	232.5	258.0	279.0
Humidity (%)	75.3	71.0	66.3	73.3	79.7	84.3	85.0	84.0	83.3	81.0	77.7	77.7
Rainfall (mm/mo)	14.2	28.5	46.0	164.1	240.5	348.2	347.0	364.7	243.1	147.0	30.7	2.0
Wind velocity (m/sec)	14.2	13.6	12.7	10.8	7.7	5.4	4.4	4.5	5.0	6.7	10.3	12.6
Wind Direction	N/NW	N/NW	SW	S	S	S	SE	SE	SE	N/NE	N	N

1) Project sites

The city of Dhaka, where the project sites are located, is 5 to 7 meters above sea level. During the rainy season, the city is often flooded. The Azimpur District, where the main center is located, is situated in the old city of Dhaka. The ground level of this project site is relatively high. The road running in front of the project site is wide and is provided with a pavement, a green belt and side ditches. This means that the project site is very unlikely to be flooded. On the other hand, the ground level of the site of the sub center, which is located in Lalkuthi of the Mirpur District, is lower than that of the roads running around it, and therefore this site will flood when it rains heavily. In this project, the ground level of the site should be raised prior to the start of the construction of the new facilities to the extent that the site's ground level is higher than that of the roads and such that rainwater automatically flows into the side ditches.

2) Wind

In and around the project sites, the wind blows from the south and the southeast in march to September, from the north and the northwest in October to February. The projected buildings should be so designed as to minimize the air conditioning cost, and they should have as many openings as possible in their southern and northern sides for natural ventilation.

3) Rain

During the rainy season, there are many rainfalls accompanied by gales. Sometimes it continues to rain for several days. It is therefore necessary to attach balconies or eaves to the buildings to prevent rainwater from entering the buildings.

4) Sunlight

In summer, the sun is strong and the temperature is high. It is necessary, therefore, to pay special attention to the insulation of the rooves. It is also necessary to prevent the interiors of the building from being exposed to direct sunlight by attaching eaves and louvers above or by the openings in the southern sides of the buildings. The number of openings in the western sides of the buildings should be minimized in order to avoid the direct sunlight.

5) Humidity

The humidity rises to more than 80 percent from summer to the rainy season. It is necessary to maximize the height of the ceiling and make each room well ventilated in order to ensure a comfortable living environment while minimizing the air conditioning cost due to the limited maintenance and management budget.

(2) Design policy relating to social condition

The project is designed to bring direct benefits to mothers and their children as a maternal and child health training institute. Moreover, the director, medical officers, administrative officer and many other staff members of the institute are women.

Therefore, male access to the training institute is limited in terms of both area and time. It is necessary to clearly indicate where men can access and make open the passageway connecting the outpatient section and the inpatient section so that it may be easy to identify the persons visiting the facility. In determining the scale of each room, it is necessary to take Bangladesh customs into consideration. First, when a child is hospitalized, the mother stays with either him or her. Second, it is customary for a medical institution to have

offices for the director and senior Consultants equipped with a private toilet and a space for receiving visitors.

- (3) Design policy relating to the present state of the local construction industry and the local building standards

Before the projects are constructed on the sites in the Azimpur District and Lalkuthi, the Mirpur District, it is necessary to obtain the approval of RAJUK (Dhaka City Planning Authority). A project implemented under Japanese grant aid cooperation is no exception to this rule. For this reason, the Directorate of Family Planning of the Ministry of Health and Family Welfare of Bangladesh, which is the organization to take charge of the implementation of this project, is required to submit all necessary drawings and specifications signed by the architects to RAJUK for approval. All projects must be designed in compliance with the Bangladesh building standards.

- (4) Design policy relating to the utilization of local suppliers and locally available equipment and materials

Equipment and building materials should be procured locally as much as possible. In consideration of their maintenance and management after the completion of this project, locally available materials should be processed using locally available machines and architectural techniques. On the other hand, most of the requested items of medical equipment are hard to procure locally, and therefore are to be imported from Japan, however medical equipment of which manufacturers have distributors with sufficient maintenance and management capabilities in Bangladesh should be selected. Since there is no problem with the quality of Bangladesh-made furniture, all necessary pieces of furniture are to be procured locally.

- (5) Design policy relating to the project implementing organization's maintenance and management capabilities

A comparison of the results of the tentative calculation of the project operating costs and the present operating costs shows that the operating costs after the completion of the main center and those after the completion of the sub center will be about 2.04 times and 3.78 times as large as the present ones, respectively. It appears these figures will impose a considerable financial burden on the Directorate of Family Planning, the Ministry of Health and Family Welfare, which is the organization responsible for the implementation of the project. For this reason, it is essential to minimize the maintenance and management costs by maximizing natural lighting and ventilation in designing the projected facilities. Ideally, the size of a nursing unit should be as small as possible if sufficient medical and nursing services are to be provided at the wards. From the standpoint of reduction in the number of staff members in charge as well as in the maintenance and management costs, partitions in each bed room should only be as high as the waist so that observation of all the patients in a bed room may be conducted at a single nurse station.

4-2 Examination of the Basic Design Conditions

(1) Facilities

It is necessary to design the project for the following six divisions so that they may be most suitable for operations to be carried out at the main center and sub center.

1. Main Center

- | | | | |
|---------------------------------|---|---|--|
| 1) Clinical service sec. | [| Obstetric/gynecology Unit | examination rooms, treatment rooms, maternity class room, etc. |
| | | Pediatric unit | examination rooms, treatment rooms, etc. |
| | | Common facilities | entrance hall, pharmacy, etc. |
| 2) Inpatient section | [| Obstetric ward | 6-bed room, 4-bed room(observation room), -bed room, etc. |
| | | Gynecology ward | 6-bed room, 2-bed room, newborn babies' room, etc. |
| | | Pediatric ward | 6-bed room, 2-bed room, attendants' room, etc. |
| 3) Operation/delivery section | — | labor room, delivery room, operation theater, Central sterilizing supply room, etc. | |
| 4) Laboratory section | — | general laboratory, hematology laboratory, ultrasonograph room, etc. | |
| 5) Administration/service dept. | — | director's room, administrative office room, machine room, etc. | |
| 6) Training Dept. | — | lecture rooms, etc. | |

2. Sub Center

- | | | | |
|---------------------------------|---|---|--|
| 1) Clinical service sec. | [| Obstetric/gynecology Unit | examination rooms, treatment rooms, maternity class room, etc. |
| | | Pediatric unit | examination rooms, treatment rooms, etc. |
| | | Common facilities | entrance hall, pharmacy, etc. |
| 2) Inpatient section | [| Obstetric ward | 6-bed room, 4-bed room(observation room), -bed room, etc. |
| | | Gynecology ward | 6-bed room, 2-bed room, newborn babies' room, etc. |
| | | Pediatric ward | 6-bed room, 2-bed room, attendants' room, etc. |
| 3) Operation/delivery section | — | labor room, delivery room, operation theater, Central sterilizing supply room, etc. | |
| 4) Laboratory section | — | general laboratory, hematology laboratory, ultrasonograph room, etc. | |
| 5) Administration/service dept. | — | director's room, administrative office room, machine room, etc. | |
| 6) Training dept. (Dormitory) | — | lecture rooms, etc. | |

(2) Conditions for the determination of the size of each projected facility

The size of each projected facility should be determined with reference to the size of a similar existing facility of the training center, Dhaka Seishu Children's Hospital, Salimullah College Hospital, Narayanganj Hospital and other public hospital in Bangladesh, as well as the Japanese standard for medical facilities.

Azimpur Main Center

1) Examination rooms, treatment rooms

The number of examination rooms is calculated on the assumption that the daily average number of outpatients will be 500 (obstetric/gynecology section: 250; pediatric section: 250;) and that daily diagnosis and treatment services will be provided from 8:00a.m. to 2:00 p.m., with a patient being diagnosed and treated every five minutes on average. Therefore, the calculation is $250 \text{ patients} \times 5 \div 6 \text{ hours} \div 4$. It will be reasonable for each section to have four examination rooms and two treatment rooms (half the number of examination rooms). The size of each room should be 18.0m^2 so that each room can also be used for practical training.

2) Entrance hall

It is assumed that the outpatients will wait for 30 minutes until they are received and for an additional 30 minutes until they are diagnosed and that about one-sixth of the daily total number of outpatients (including attendants) will stay in the entrance hall and the waiting space. Thus the calculation is $500 \times 1/6 \div 84$ patients. And the space per outpatient of the entrance hall should be $1.4 \sim 1.6\text{m}^2$, however most of the outpatient bring their family. Therefore the space provided for a patient should be 2.0m^2 .

3) Maternity class room

The time table for maternity class is not settled. Class will begin when 40 mothers are gathered. Lecture benches should be furnished for 40 mothers. Ordinary lecture room requires $1.6\text{m}^2\sim 1.8\text{m}^2$ of space for one person, however, for this project the majority of mothers come with their children. Therefore, the space provided for per mother should 2.7m^2 .

4) Bed room (6-bed room, 2-bed room)

A standard of the Ministry of Health & Welfare of Japan for the minimum requirement of floor area per bed in hospital bed room is 4.2m^2 . But, for the project, $6.0\text{m}^2/\text{bed}$ are used as a standard because a member of patient's family will stay with them. Beds are to be placed within 6.0m span.

5) Labor room, delivery room

The labor room should have six beds, and the delivery room should have four beds, in order to handle about 5,000 childbirths a year (about 15 a day, $1/3$ of that can be received at the labor room simultaneously, and $1/2$ of the received women suppose to be delivered of at the same time, also making allowance with one extra bed each). These rooms should be larger than ordinary bed room in case of emergency use and also be used for practical training (for groups of about five trainees per session). The space per bed should be 9.0m^2 for the labor room and 20.0m^2 for the delivery room.

6) Operation theater

Mainly sterilization and Caesarean operations are to be performed in the Operation theater. It is estimated that a single operation theater will suffice for the projected number of operations, but

that two operation theaters should be provided in order to prevent secondary infection as a result of an operation being performed on a patient suffering from an infectious disease. The size of each operation theater should be 36.0m² so that it can also be used for practical training (for groups of about five trainees per session). Ordinary operation theaters require 24.0m²~30.0m² of floor area for one, therefore 6.0m²~12.0m² of area is for training space.

7) Administration office room

The size of the administration office room should be determined on the basis of a 6.0m² space for the administrative officer and a 4.0m² space for each office staff.

8) Lecture rooms

Judging from the proposed training time schedule, 6 training courses will be conducted at the facility simultaneously. The lecture rooms will be used for mainly 3 subjects; dietetics, hygenics and family planning. Each subject takes 1.0 hour. Therefore, total number of subject hours is 6 courses × 3 subjects × 1 hour = 18 hours. Business hour of MCHTI is 18 hours ÷ 6 hours = 3 rooms. Each lecture room should be seating capacity of 20.

Lalkuthi: Sub center

The design of facilities which differ from the ones planned at the main center is explained below:

1) Examination rooms, treatment rooms

The number of examination rooms is calculated on the assumption that the daily average number of outpatients will be 400

(obstetric/gynecologic section: 200; pediatric section: 200) and that daily diagnosis and treatment services will be provided from 8:00 a.m. to 2:00 p.m., with a patient being diagnosed and treated every five minutes on average. Therefore, the calculation is $200 \text{ patients} \times 5 \text{ minutes} \div 6 \text{ hours} \doteq 3$. It will be reasonable for this section to have three examination rooms and a treatment room. The size of each room should be 18.0m^2 so that each room can also be used for practical training (for groups of about five trainees per session).

2) Entrance hall

It is assumed that the outpatients will wait for 30 minutes until they are received and for an additional 30 minutes until they are diagnosed and that about one-sixth of the daily total number of outpatients will stay in the entrance hall and the waiting space. Thus the calculation is $400 \times 1/6 \doteq 67$ patients. And the space per outpatient of the entrance hall should be $1.4\sim 1.6\text{m}^2$, however the most outpatient bring their family. Therefore the space provided for a patient should be 2.0m^2 .

3) Labor room, delivery room

The labor room should have four beds, and the delivery room three beds, in order to handle about 3,000 childbirths a year (about 10/day, $1/3$ of which can be received at the labor room simultaneously). These rooms should be larger than ordinary bed room in case of emergency use and also be used for practical training (for groups of about five trainees per session). The space per bed should be 9.0m^2 for the labor room and 20.0m^2 for the delivery room.

4) Dormitory

The sub center is to accept two groups of about 20 trainees to participate in a long-term basic FWV training course. The size of the dormitory for these trainees should be determined on the basis of 20 rooms in total and a 15.0m² space for each room (to be occupied by two trainees).

(3) Selection of Medical Equipment

Selection of medical equipment will be based upon the activities of both centers - diagnosis/treatment of Obstetrics/Gynecology, and pediatrics. For laboratory, equipment will be selected to meet the requirements for general tests, pathology tests and blood test. For the operation theater, the selected equipment will be for Caesarean section operations and sterilization. For training activities, fundamental teaching material and equipment will be selected.

(4) Applicable Laws, regulations and standards

The following laws, regulations and standards are applicable to the basic design for this project:

1) Architectural design:

"The Building Standard of Bangladesh"

2) Structural design:

"Regulations to Enforce the Building Standard" (Japan), "Standard of Calculation for the Design of Reinforced Concrete Structures" (Japan)

3) Electrical design:

"IEC (International Electrotechnical Commission) Standards," "BS (British Standard) Standards"

4-3 Basic Facility Plan

4-3-1 Layout Plan

(1) Actual situation of the project sites

1) Azimpur Main center

The site for the project main center is located in Azimpur District which is situated in the southwestern part of the city of Dhaka. This corresponds to the west end of the old city. The site can be easily accessed by many citizens of the city. It is surrounded by school buildings, government employees' housing and other buildings. The road running in front of the project site has a width of 15 meters and a width of about 25 meters with a green belt. The project site is conveniently located for a medical institution. However, the project site is a part of the premises of the Directorate of Family Planning of the Ministry of Health and Family Welfare, under whose supervision MCHTI is operating, and its area is relatively small (about 2,200 m²). Therefore it will be necessary, to design a multi-story building to build a facility with 200 beds on the project site.

2) Lalkuthi Sub center

The site for the sub center, is located in a new residential section of the city, which is situated in the northwestern part of the city of Dhaka. Being surrounded by many residential buildings, the project site can be said to be conveniently located as the site for a medical institution. It is about 200 meters away from the main road in the district (Mirpur Road). It has an area of about 4,590m², which is large compared to that of the site for the main center. It is shaped like a rectangle with the long side extending south to north. The design conditions of the site for constructing a building is the same as the site of the main

center. Therefore, the building which has an east-west axis can not be built. It will be necessary to design the building with 150 beds as one with a relatively large number of stories. And the site is lower than the roads, it will therefore be flooded when it rain havily.

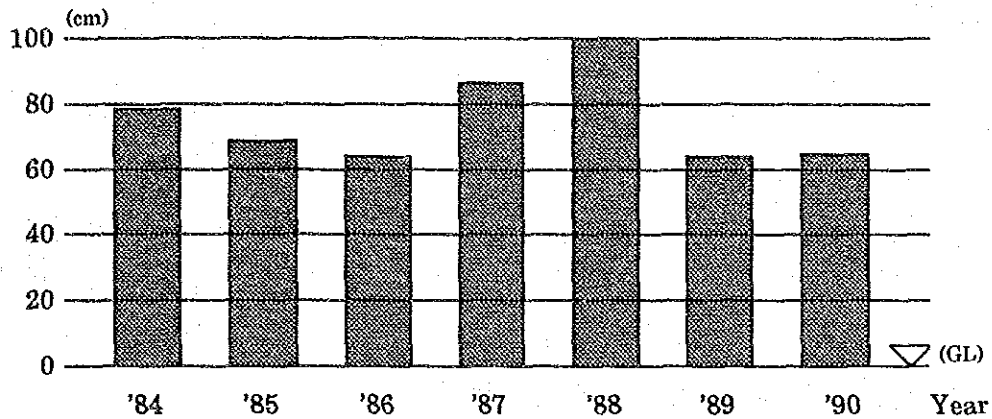


Fig. 4-1 Flooded Water Level at Lalkuthi

(Source: MCHTD)

According to the record, fig. 4-1, the site will be covered with water every year. The level of the site has to be raised prior to construction.

(2) Layout plan

1) Main center

Under the project, a medical building and a service building are to be constructed. The two buildings are to be connected to each other with a corridor at each story. The main paths of flow are to be placed at suitable position for both buildings. Judging from the present conditions of the surrounding roads and traffic on them, the main flow of both the patients and the staff members is the approach from Azimpur Road on the western side of the site. For this reason, the main entrance to the site should be constructed adjacent to Azimpur Road. A service entrance should also be constructed adjacent to the private road that leads to the

building of the Directorate of Family Planning so that it will not cross the path of flow from the main entrance.

2) Sub center

Facilities of the sub center consist of the medical building, the service building and the dormitory building. Main entrance to the premises is located on the south , due to the location of an access road on the south and east side of the site. To avoid confusion of traffic flow on the premises, the medical building is placed facing the access road with the service building placed behind it. The dormitory building is placed along the north boundary which is the other end of the site from the entrance.

4-3-2 Architectural Plan

(1) Determination of the size of each facility

The size of each projected room should be determined on the basis of the room layout plan and the planned number of staff members to occupy it.

Azimpur Main center

1. Clinical Service Section

Room Name	No.	Area (m ²)	Remarks
Obstetrics/Gynecology			<ul style="list-style-type: none"> It is assumed that the Clinical service section will diagnose and treat 500 outpatients (obstetric/gynecologic section: 250 outpatients; pediatric section: 250 outpatients) a day (from 8:00 a.m. to 2:00 p.m.), each outpatient being diagnosed and treated for 5 minutes. $250 \times 5 \text{ minutes} \div 6 \text{ hours} \div 4$ Each clinical department will have 4 examination rooms and the number of the treatment rooms will be about half of the number of examination rooms. A maternity class will consist of 30 mothers. The floor space per mother/child will be 2.7m². It is assumed that outpatients' average waiting time will be 60 minutes (30 minutes till registration and 30 minutes diagnosis and treatment) and that about 84 outpatients (500×1/6) and their attendants will stay in the waiting space. The waiting space per patient/attendant will be about 2.0m². The Pharmacy, the immunization room and other facilities will be designed with reference to the training center's existing one. Each medical officer room is to accommodate 2 MOS. The floor space of each toilet is to be calculated on the basis of the necessary number of Sanitary fixture (one Sanitary fixture for every 40 to 50 outpatient)
Examination Rm	4	72.0	
Treatment Rm	2	36.0	
Maternity Class Rm	1	108.0	
Pediatrics			
Examination Rm	4	72.0	
Treatment Rm	2	36.0	
Entrance Hall	1	108.0	
Medical Records Rm	1	30.0	
Pharmacy	1	24.0	
Immunization Rm	1	18.0	
M.O. Rm -1	1	18.0	
M.O. Rm -2	1	18.0	
Guard Rm	1	9.0	
Duty Rm	1	9.0	
Toilet (F)	1	21.6	
Toilet (M)	1	14.4	
Corridor	1	324.0	
Staircase	1	36.0	
Total		954.0	

2. Inpatient Section

Room Name	No.	Area (m ²)	Remarks
Obstetrics Ward			
6-Bed Rm	9	324.0	• Each bed is to be placed within a 6.0m span. In consideration of the space for inpatients' attendants, the standard floor space per bed will be 6.0m ² .
4-Bed/Observation Rm	1	36.0	
2-Bed Rm	4	72.0	• Each of nurse stations and the treatment rooms is to be large enough to accommodate 4 to 5 trainees, as well as the equipment.
Nurse Station	1	27.0	
Duty Rm	1	13.5	
Treatment Rm	1	13.5	
Pantry	1	9.0	• The floor space of each shower stall is to be calculated on the basis of the necessary number of shower stalls (one shower stall for every 20 inpatients).
Wash Rm	1	9.0	
Waste Disposal	1	10.8	• The floor space of each M.O. room will be about 9.0m ² on the assumption that 2 M.O. in charge and a M.O. on duty will attend to their respective duties and take a rest there.
Shower Rm	1	10.8	
Linen Rm	1	18.0	• The floor space of the conference room is to be calculated on the assumption that 8 to 10 staff members will have meetings in the conference room and that groups of trainees will use it.
Storage	1	18.0	
M.O. Rm	1	18.0	
Conference Rm	1	21.0	
Toilet	1	14.4	
Corridor	1	360.0	
Staircase	1	36.0	• Each bed is to be placed within a 6.0m span. In consideration of the space for inpatients' attendants, the standards floor space per bed will be 6.0m ² .
Gynecologic Ward			
6-Bed Rm	7	252.0	
2-Bed Rm	2	36.0	• The treatment and other rooms is to be large enough to accommodate 4 to 5 trainees, as well as the equipment.
Nurse Station	1	27.0	
Duty Rm	1	13.5	
Treatment Rm	1	13.5	• The floor space of each shower stall and toilet will be calculated on the basis of the necessary numbers of shower stalls and lavatories (one shower stall for every 20 inpatients and one lavatory for every 20 inpatients).
Pantry	1	9.0	
Wash Rm	1	9.0	
Waste Disposal	1	10.8	
Shower Rm	1	10.8	
Linen Rm	1	18.0	
Storage	1	18.0	
M.O. Rm	1	18.0	• The floor space of each M.O. room will be about 9.0m ² on the assumption that 2 M.O. in charge and a M.O. on duty will attend to their respective duties and take a rest there.
Toilet	1	14.4	
Corridor	1	288.0	

Room Name	No.	Area (m ²)	Remarks
Staircase	1	36.0	<ul style="list-style-type: none"> • The floor space per bed of each infant observation room will be 5.0m² in consideration of the arrangement of the equipment and the necessary space for nursing and treatment, as well as the space for newborn babies' mothers. • Each bed is to be placed within a 6.0m span. In consideration of the space for inpatients' attendants, the standard floor space per bed will be 6.0m². • The treatment room should be large enough to accommodate a group of about 5 trainees, as well as the equipment. • The floor space of shower Rm is to be calculated on the basis of the necessary number of shower stalls (one shower stall for every 20 inpatients). • The attendants' area is one for mothers of infant patients. • The floor space of conference room is to be calculated on the assumption that 8 to 10 staff members will have meeting in the Conference room and that groups of trainees will use it. • The floor space of each M.O. room will be about 9.0m² on the assumption that 2 M.O. in charge and a M.O. on duty will attend to their respective duties and take a rest there.
Infant Observation			
Infant Observation Rm-1	1	81.0	
Infant Observation Rm-2	1	81.0	
Attendant Area	1	36.0	
Pediatric Ward			
6-Bed Rm	7	252.0	
2-Bed Rm	5	90.0	
Nurse Station	1	27.0	
Duty Rm	1	13.5	
Treatment Rm	1	13.5	
Pantry	1	9.0	
Wash Rm	1	9.0	
Waste Disposal	1	10.8	
Shower Rm	1	10.8	
Linen Rm	1	18.0	
Storage	1	18.0	
Attendant Area	1	36.0	
Conference	1	18.0	
M.O. Rm	1	18.0	
Toilet	1	14.4	
Corridor	1	324.0	
Staircase	1	36.0	
Total		2901.0	

3. Operation/Delivery Section

Room Name	No.	Area (m ²)	Remarks
Labor Rm	1	54.0	<ul style="list-style-type: none"> • It is assumed that 6 labor beds and 4 delivery beds will be installed and that about 5,000 deliveries will be handled a year (about 15 deliveries a day). It is also assumed that these facilities will be used in case of emergency as well as for practical training. The floor space per labor bed will be 9.0m² and that per delivery bed 20.0m².
Nurse Station	1	18.0	
Duty Rm	1	15.0	
Delivery Rm 1	1	42.0	
Delivery Rm 2	1	42.0	
Preparation Rm	1	24.0	

Room Name	No.	Area (m ²)	Remarks
Ante Rm	1	21.0	<ul style="list-style-type: none"> Mainly sterilization and Caesarean operations will be performed in the O.T. Although only one O.T. is needed in light of the projected frequency of operation, two operating rooms will be constructed because of the need to prevent secondary infection following operations on infectious disease patients. The floor space of other rooms is to be calculated taking into account the equipment to be installed.
Changing Rm (F)	1	13.2	
Changing Rm (M)	1	15.0	
O.T. Hall	1	61.92	
O.T. 1	1	36.0	
O.T. 2	1	36.0	
Recording Office	1	13.2	
C.S.S. Rm	1	24.0	
Staff Rm	1	7.5	
Storage 1	1	12.6	
Storage 2	1	18.0	
Storage 3	1	4.5	
Corridor	1	99.0	
Staircase	1	18.0	
Total		565.92	

4. Laboratory Section

Room Name	Number	Area (m ²)	Remarks
General Lab	1	36.0	<ul style="list-style-type: none"> The floor of each room will differ depending on the arrangement of the equipment. Biochemical and urinal test will be conducted in the general Lab. room, while blood tests will be conducted and blood will be stored in the Hematology Lab. It is also assumed that a washing will be installed within Lab.
Toilet	1	18.0	
Hematology Lab	1	36.0	
Ultra Sonograph Rm	1	36.0	
Total		126.0	

5. Administration/Service Dept.

Room Name	No.	Area (m ²)	Remarks
Director	1	36.0	<ul style="list-style-type: none"> Director require a private room with reception area. Deputy superintendent is the Head of the Center. Deputy and Asst. Director are next to Deputy Superintendent. Sr. Consultants are equivalent to Asst. Director
Deputy Superintendent Rm	1	24.0	
Deputy Director Rm	1	18.0	
Asst. Director Rm	1	16.32	
Sr. Consultant Rm 1	1	16.92	
Sr. Consultant Rm 2	1	16.92	

Room Name	No.	Area (m ²)	Remarks
Sr. Consultant Rm-3	1	16.92	
Sr. Consultant Rm-4	1	16.92	
Sr. Consultant Rm-5	1	16.92	
Administration Office	1	49.2	Office and 10 others: 1 person×6.0m ² + 10persons × 4.0m ² =46.0m ²
Registrar Rm	1	36.0	The registrar and 3 others: 4 persons×9.0m ² =36.0m ²
Accountant Office	1	15.6	Accountant and 3 others: 1 person×6.0m ² +2 persons ×4.0m ² =14.0m ²
PABX Rm	1	9.0	According to equipment layouts.
Pantry	1	5.0	According to equipment layouts.
Machine Rm	1	18.0	According to equipment layouts.
Kitchen	1	57.6	According to Kitchen equipment layout
Pump Rm	1	18.0	According to equipment layout
Electrical Rm	1	71.8	According to equipment layout
Meter Rm	1	5.0	According to equipment layout
Generator Rm	1	38.4	According to equipment layout
Linen Storage	1	36.0	
Staff Rm	1	18.0	1 technical and 4 staffs 1 person×6.0m ² +3 persons ×4.0m ² =18.0m ²
Administration Office	1	18.0	4 administrative staff: 4 persons×4.0m ² =16.0m ²
Storage 1	1	36.0	
Storage 2	1	9.0	
Storage 3	1	9.0	
Library	1	14.4	This room is to be used also as the lecturers' preparation room
Expert's Rm	1	24.0	The post of Expert is equivalent to that of deputy director.
Staff Rm	1	24.0	7 assistants to lecturer: 7 persons×4.0m ² =28.0m ²
Conference Rm	1	24.0	13 persons×1.85m ²
M.S. Rm	1	21.6	3 lecturers: 3 persons×6.0m ² =18.0m ²
Training Coordinator	1	21.6	Training coordinator is equivalent to Asst. Director
Pantry	1	5.0	
Toilet 1	1	5.0	The floor space of each tile is to be calculated on the basis of the necessary number of lavatories.
Toilet 2	1	7.0	
Toilet 3	1	4.0	
Toilet 4	1	5.0	
Corridor	1	231.2	
Staircase	1	27.0	
Total		1042.32	

6. Training Dept.

Room Name	No.	Area (m ²)	Remarks
Lecture Rm 1	1	36.0	<ul style="list-style-type: none"> The floor space per trainee of each lecture room will be 1.3m² to 1.5m² on the assumption that 3 class of trainees (each class consisting of 20 trainees) will be in room at a time. The floor space of each toilet is to be calculated on the basis of the necessary number of lavatories (one lavatory for every 20 trainees).
Lecture Rm 2	1	36.0	
Lecture Rm 3	1	54.0	
Toilet	1	18.0	
Corridor	1	82.8	
Staircase	1	18.0	
Total		244.8	

7. Common

Room Name	No.	Area (m ²)	Remarks
Slope	—	259.2	
Balcony	—	475.5	
Penthouse	—	36.0	
total		770.7	

Grand Total	6604.74
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Lalkuthi Sub center

1. Medical Dept.

Room Name	No.	Area (m ²)	Remarks
Obstetrics/Gynecology			<ul style="list-style-type: none"> It is assumed that the medical departments will diagnose and treat 400 outpatients (obstetric/gynecologic section: 200 outpatients; pediatric section: 200 outpatients) a day (from 8:00 a.m. to 2:00 p.m.), each outpatient being diagnosed and treated for 5 minutes. $200 \text{ persons} \times 5 \text{ minutes} + 6 \text{ hours} \div 3$ Each section will have 3 examination rooms and the number of the treatment rooms will be about half of the number of the examination rooms. Maternity class will consist of 30 mothers. The floor space per mother/child will be 2.7m². It is assumed that outpatients' average waiting time will be 60 minutes (30 minutes till registration and 30 minutes till diagnosis and treatment) and that about 67 outpatients ($400 \times 1/6$) and their attendants will stay in the waiting area. The waiting area per patient/attendant will be about 2.0m². The pharmacy, the immunization room and other facilities will be designed with reference to the training center's existing ones. Each medical officer room is to accommodate 2 MO. The floor space of each toilet is to be calculated on the basis of the necessary number of sanitary fixture (one sanitary fixture for every 40 to 50 outpatients).
Examination Rm	3	54.0	
Treatment Rm	2	36.0	
Maternity Class Rm	1	81.0	
Pediatrics			
Examination Rm	3	54.0	
Treatment Rm	1	18.0	
Entrance Hall	1	81.0	
Medical Records Rm	1	18.0	
Pharmacy	1	24.0	
Immunization Rm	1	18.0	
M.O. Rm -1	1	18.0	
M.O. Rm -2	1	18.0	
Guard Rm	1	15.0	
Duty Rm	1	9.0	
Toilet (F)	1	21.6	
Toilet (M)	1	14.4	
Corridor (inc. waiting)	1	306.0	
Staircase	1	36.0	
Total		822.0	

2. Inpatient Section

Room Name	No.	Area (m ²)	Remarks
Obstetrics Ward			<ul style="list-style-type: none"> Each bed is to be placed within a 6.0m span. In consideration of the space for inpatients' attendants, the standard floor space per bed will be 6.0m². Each of the nurse stations and the treatment rooms is to be large enough to accommodate 4 to 5 trainees, as well as the equipment.
6-Bed Rm	6	216.0	
2-Bed/Observation Rm	1	18.0	
2-Bed Rm	4	72.0	
Nurse Station	1	27.0	
Duty Rm	1	13.5	
Treatment Rm	1	13.5	
Pantry	1	9.0	
Wash Rm	1	9.0	

Room Name	No.	Area (m ²)	Remarks
Waste Disposal	1	10.8	
Shower Rm	1	10.8	• The floor space of shower room is to be calculated on the basis of the necessary number of shower stalls (one shower stall for every 20 inpatients).
Linen Rm	1	18.0	
Storage-1	1	18.0	• The floor space of each M.O. room will be about 9.0m ² on the assumption that 2 M.O. in charge and a M.O. on duty will attend to their respective duties and take a rest there.
Storage-2	1	18.0	
M.O. Rm	1	18.0	
Conference Rm	1	18.0	• The floor space of the conference room is to be calculated on the assumption that 8 to 10 staff members will have meetings in the conference room and that groups of trainees will use it.
Toilet	1	14.4	
Corridor	1	324.0	
Staircase	1	36.0	
Gynecology Ward			
6-Bed Rm	5	180.0	• Each bed is to be place within a 6.0m span. In consideration of the space for inpatients' attendants, the standard floor space per bed will be 6.0m ² .
2-Bed Rm	1	36.0	
Nurse Station	1	27.0	
Duty Rm	1	13.5	• The treatment and other rooms is to be large enough to accommodate 4 to 5 trainees, as well as the equipment.
Treatment Rm	1	13.5	
Pantry	1	9.0	
Wash Rm	1	9.0	• The floor space of each shower stall and toilet will be calculated on the basis of the necessary numbers of shower stalls and lavatories (one shower stall for every 20 inpatients and one lavatory for every 20 inpatients).
Waste Disposal	1	10.8	
Shower Rm	1	10.8	
Linen Rm	1	18.0	• The floor space of each M.O. room will be about 9.2 m ² on the assumption that 2 M.O. in charge and a M.O. on duty will attend to their respective duties and take a rest there.
Storage	1	18.0	
M.O. Rm	1	18.0	
Toilet	1	14.4	
Corridor	1	270.0	• The floor space per bed of each infant observation room will be 5.0m ² in consideration of the arrangement of the equipment and the necessary space for nursing and treatment, as well as the space for newborn babies' mothers.
Staircase	1	36.0	
Infant Observation			
Infant Observation-1	1	54.0	
Infant Observation-2	1	54.0	• Each bed is to be place within a 6.0m span. In consideration of the space for inpatients' attendants, the standard floor space per bed will be 6.0m ² .
Attendant Area	1	36.0	
Pediatric Ward			
6-Bed Rm	7	252.0	
2-Bed Rm	2	36.0	

Room Name	No.	Area (m ²)	Remarks
Nurse Station	1	27.0	<ul style="list-style-type: none"> • The treatment room should be large enough to accommodate a group of about 5 trainees, as well as the equipment. • The floor space of shower Rm is to be calculated on the basis of the necessary number of shower stalls (one shower stall for every 20 inpatients). • The attendants area is one for mothers of infant patients. • The floor space of each M.O. room will be about 9.0m² on the assumption that 2 M.O. in charge and a M.O. on duty will attend to their respective duties and take a rest there.
Duty Rm	1	13.5	
Treatment Rm	1	13.5	
Pantry	1	9.0	
Wash Rm	1	9.0	
Waste Disposal	1	10.8	
Shower Rm	1	10.8	
Linen Rm	1	18.0	
Storage	1	18.0	
Attendant Area	1	18.0	
Conference Rm	1	18.0	
M.O. Rm	1	18.0	
Toilet	1	14.4	
Corridor	1	306.0	
Staircase	1	36.0	
Total		2520.0	

3. Operation/Delivery Section

Room Name	No.	Area (m ²)	Remarks
Labor Rm	1	45.0	<ul style="list-style-type: none"> • It is assumed that 4 labor beds and 3 delivery beds will be installed and that about 3,000 deliveries will be handled a year (about 10 deliveries a day). It is also assumed that these facilities will be used in case of emergency as well as for practical training. The floor space per labor bed will be 9.0m² and that per delivery bed 20.0m². • Mainly sterilization and Caesarean operations will be performed in the O.T. Although only one O.T. is needed in light of the projected frequency of operation, two operating rooms will be constructed because of the need to prevent secondary infection following operations on infectious disease patients. • The floor space of other rooms is to be calculated taking into account the equipment to be installed.
Nurse Station	1	13.5	
Duty Rm	1	13.5	
Delivery Rm 1	1	21.0	
Delivery Rm 2	1	54.0	
Preparation Rm		15.0	
Ante Rm	1	21.0	
Changing Rm (F)	1	13.2	
Changing Rm (M)	1	15.0	
O.T. Hall	1	61.92	
O.T. 1	1	36.0	
O.T. 2	1	36.0	
Recording Office	1	13.2	

Room Name	No.	Area (m ²)	Remarks
C.S.S.	1	24.0	The arrangement of the equipment should be taken into account.
Staff Rm	1	7.5	
Storage 1	1	17.28	
Storage 2	1	18.0	
Storage 3	1	4.5	
Corridor	1	83.52	
Staircase	1	18.0	
Total		531.12	

4. Laboratory Section

Room Name	No.	Area (m ²)	Remarks
General Lab.	1	36.0	* The floor of each room will differ depending on the arrangement of the equipment. Biochemical and urinal test will be conducted in the general lab, while blood tests will be conducted and blood will be stored in the Haematology Lab. It is also assumed that a washing will be installed within Lab.
Haematology Lab.	1	36.0	
Ultra Sonograph Rm	1	36.0	
Total		108.0	

5. Administration/Service Dept.

Room Name	No.	Area (m ²)	Remarks
Deputy Superintendent Rm	1	26.0	The post of deputy superintendent is the head of the center. The post of deputy director ranks second to that of deputy superintendent. The post of assistant director ranks second to that of deputy director. The post of senior consultant is equivalent to assistant director.
Deputy Director Rm	1	18.0	
Asst. Director Rm	1	18.0	
Sr. Consultant Rm 1	1	16.3	
Sr. Consultant Rm 2	1	16.3	
Sr. Consultant Rm 3	1	16.3	
Sr. Consultant Rm 4	1	16.3	
Registrar rm	1	31.2	The registrar and 3 others: $4 \text{ persons} \times 9.0\text{m}^2 = 36.0\text{m}^2$
Administration Rm	1	42.6	Officer and 10 others: $1 \text{ person} \times 6.0\text{m}^2 + 10 \text{ persons} \times 4.0\text{m}^2 = 46.0\text{m}^2$
Accountant Office	1	18.0	Accountant and 3 others: $1 \text{ person} \times 6.0\text{m}^2 + 3 \text{ persons} \times 4.0\text{m}^2 = 18.0\text{m}^2$
PABX RM	1	10.5	The arrangement of the equipment should be taken into account.
Conference Rm	1	23.1	$13 \text{ persons} \times 1.78\text{m}^2$
Machine Rm-1	1	18.0	The arrangement of the equipment should be taken into account.
Pantry	1	2.25	

Room Name	No.	Area (m ²)	Remarks
Library	1	9.0	This room is to be used also as the lecturers' preparation room.
M.S. Rm	1	18.0	3 lecturers: 3 persons \times 6.0m ² = 18.0m ²
Staff Rm -1	1	25.2	7 assistants to lecturer: 7 persons \times 4.0m ² = 28.0m ²
Training Coordinator	1	21.6	The post of training coordinator is equivalent to that of deputy superintendent.
Conference Rm	1	18.0	this room is to be used as a place for section meeting and training.
Kitchen	1	54.0	The arrangement of the kitchen equipment should be taken into account.
Electrical Rm	1	73.22	The arrangement of the kitchen equipment should be taken into account.
Generator Rm	1	36.48	The arrangement of the machine should be taken into account.
Meter Rm	1	5.5	The arrangement of the machines should be taken in account.
Pump Rm	1	10.8	The arrangement of the machines should be taken in account.
Linen Storage	1	36.0	
Staff Rm-2	1	18.0	5 persons \times 3.0m ²
Storage 1	1	12.6	
Storage 2	1	36.0	
Storage 3	1	10.8	
Storage 4	1	9.0	
Toilet 1	1	6.75	The floor space of each toile is to be calculated on the basis of the necessary number of lavatories.
Toilet 2	1	5.4	
Toilet 3	1	5.4	
Corridor	1	252.12	
Staircase	1	360	
Total		972.72	

6. Training Dept.

Room Name	No.	Area (m ²)	Remarks
Lecture Rm 1	1	36.0	• The floor space per trainee of each lecture room will be 1.3m ² to 1.5m ² on the assumption that 3 class of trainees (each class consisting of 20 trainees) will be in room at a time. The floor space of each toilet is to be calculated on the basis of the necessary number of lavatories (one lavatory for every 20 trainees).
Lecture Rm 2	1	36.0	
Lecture Rm 3	1	54.0	
Toilet	1	18.0	• The training division is to accept trainees to take basic courses for FWVs (two classes, each class consisting of 20 trainees). Therefore, a dormitory with 20 rooms (each room to be occupied by two trainees) will be constructs.
Corridor	1	82.8	
Staircase	1	18.0	
Dormitory	1	546.0	
Total		790.8	

7. Common

Room Name	No.	Area (m ²)	Remarks
Slope	-	259.2	
Balcony	-	324.0	
Penthouse	-	36.0	
Total		619.2	
Grant Total		6363.84	

(2) Floor Plan

The basic floor plan is common to both the main center and the sub center. All the functions relating to outpatient service are to be concentrated on the ground floor of the clinical service section. For this reason, all the facilities of clinical service section and the laboratory section should be located on this floor. The kitchen, the linen storage, the machine room and other internal service-related rooms should be located on the ground floor of the service building. The entire first floor of the medical building should be the obstetric ward, with the facilities of the operation and delivery section being located in the service building. This arrangement is aims for smooth flow of patients from the ward to the service building. The gynecology ward and the infant observation should be located on the second floor of the medical building, and the facilities of the administration division in the service building. The entire third floor of the medical building should be space for the pediatric ward, and the facilities of the training division in the service building. The floor plan for each of the main section is as described below:

1) Clinical Service Section

A long open counter that faces the entrance hall will be installed, and three to four staff members will receive outpatients there. At the reception counter, these staff members will fill in outpatients'

medical record cards, medical examination notebooks and family planning card and then receive the registration fee. After that, outpatients will be told which room to go. This department's rooms will be classified by section and unit - the family planning unit, the obstetric/gynecologic unit, the pediatric unit and the laboratory section. The obstetric/gynecologic unit's rooms, in order to minimize the effects of crying and infection from the pediatric unit, should have the laboratory section's rooms located in between. Each of these rooms should be spacious enough to accommodate about five trainees. The medical record room and the pharmacy will be so located that they will face the entrance hall. Under such an arrangement, it will be easy to retrieve medical record cards, send them to relevant medical sections, receive prescriptions and dispense drugs. A courtyard should be included in the floor plan so that all these rooms, as well as the entrance hall and the waiting space, may be well lighted and ventilated.

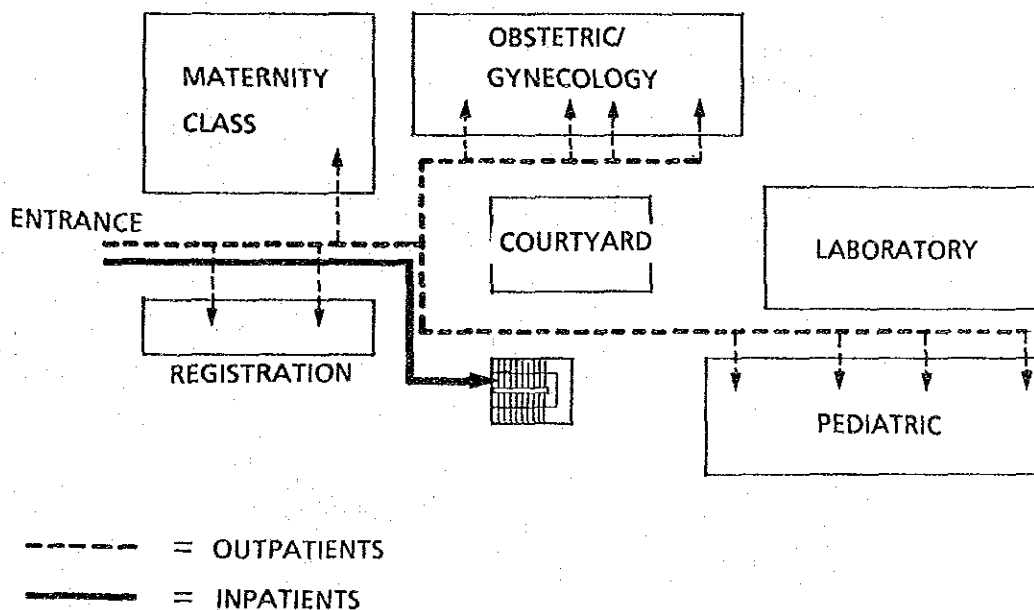


Fig. 4-2 Flow in Clinical Service Section

2) Inpatient Section

The main center's wards will be an obstetric ward (72 beds) on the first floor of the medical building, a gynecology ward (46 beds) and a infant observation room (30 beds) on the second floor and pediatric ward (52 beds) on the third floor. The sub center's wards will be an obstetric ward (50 beds) on the first floor of the medical building, a gynecology ward (34 beds) and infant observation room (20 beds) on the second floor, and a pediatric ward (46 beds) on the third floor.

① Obstetric ward

The facilities of the obstetric ward should be designed with an emphasis on their relationship with those of the operation/delivery section, where mainly Caesarean operations and sterilization will be performed. For this reason, they will be located on the same floor of the operation and delivery section. Each room should be well lighted and ventilated, and a light court will be provided in the center of the building. The nurse station should be located in a place convenient for monitoring all the bed room. An observation room should be located adjacent to the nurse station for the care of serious cases. The incidental facilities include: toilets; pantry; shower room; a wash room; a water heating room; a linen warehouse; a general warehouse; and a conference room.