MINISTRY OF HEALTH AND FAMILY WELFARE

THE PEOPLE'S REPUBLIC OF BANGLADESH

BASIC DESIGN STUDY REPORT

ON

THE PROJECT FOR SUPPORT TO STRENGTHENING

OF

EMERGENCY OBSTETRIC CARE SERVICE

IN

THE PEOPLE'S REPUBLIC OF BANGLADESH

FEBRUARY 2002

JAPAN INTERNATIONAL COOPERATION AGENCY
DAIICHI HEALTH CARE FACILITY CONSULTANTS INC.

Preface

In response to a request from the Government of the People's Republic of Bangladesh, the Government of Japan decided to conduct a basic design study on the Project for Support to Strengthening of Emergency Obstetric Care Services and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Bangladesh a study team from 5 August to 12 September, 2001.

The team held discussions with the officials concerned of the Government of Bangladesh, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Bangladesh in order to discuss a draft basic design, and as this result, the present report was finalized.

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

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

February, 2002

Takao Kawakami

President

Japan International Cooperation Agency

February,2002

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Support to Strengthening of Emergency Obstetric Care Services in the People's Republic of Bangladesh.

This study was conducted by Daiichi Health Care Facility Consultants Inc, under a contract to JICA, during the period from July, 2001 to February, 2002. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Bangladesh and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

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

Very truly yours,

Masanori Abe
Project manager,
Basic design study team on
The Project for Support to Strengthening of
Emergency Obstetric Care Services
in the People's Republic of Bangladesh

Location Map

Abreviations

A / P	Authorization to Pay
B / A	Banking Arrangement
B-EOC	Basic Emergency Obstetric Care
C-EOC	Comprehensive Emergency Obstetric Care
DEMEW	District Electro Medical Equipment Maintenance Workshop
DGHS	Directorate General of Health Service, Ministry of Health and Family Welfare
DGFP	Directorate General of Family Planning, Ministry of Health and Family Welfare
DH	District Hospital
E / N	Exchange of Notes
EOC	Emergency Obstetric Care
ESP	Essential Service Package
GNP	Gross National Product
HPSP	Health and Population Sector Programme
HPSS	Health and Population Sector Strategy
IDA	International Development Association
MMR	Maternal Mortality Ratio
MOHFW	Ministry of Health and Familiy Welfare
NEMEW&TC	National Electro Medical Equipment Maintenance Workshop & Training Center
NGO	Non-Governmental Organization
THC	Thana Health Complex
TK	Taka(Currency
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
WB	World Bank
WHO	World Health Organization

SUMMARY

In the People's Republic of Bangladesh (hereinafter referred to as "Bangladesh"), the average life expectancy is 58 years, which is substantially lower than that of principal developed nations; the figure is more than two years shorter than that of neighboring countries such as India, for example, where the average life expectancy is 60 years. As shown in the table below, the situation in the field of health and hygiene is deplorable. In particular, with regard to maternal and child health, women on the average marry and first give birth at very young ages, and because social values favor males, women give birth numerous times until a male child is born. In addition, because it is difficult to avoid unwanted pregnancies, women become pregnant and give birth numerous times, and in addition to the factor of chronic malnutrition, persons with no training in delivery care serve as midwives or birth assistants at home births in the majority of cases. Because of these and other factors, the rate of mothers (expecting and nursing mothers) who die or become ill in childbirth is extremely high, and these factors contribute to lowering the average life expectancy for women.

	Bangladesh	India	Sri Lanka	Pakistan	Developed countries	Developing countries
Average life expectancy (male/female)	58.1 / 58.2	62.3 / 62.9	70.9 / 75.4	62.9 / 65.1	71.1 / 78.8	61.8 / 65.0
Infant mortality rate	79	72	18	74	9	63
Maternal mortality rate	850	437	30	340	13	470

In order to improve the poor health and hygiene conditions in Bangladesh, a "National Health and Population Strategy" was formulated in 1997 that consolidates health policies and population policies, and is aimed both at providing the health and medical services (an Essential Service Package) required by the people of the country and at suppressing population increases.

The foremost issues addressed by this strategy are:

1) the ongoing preservation and expansion of policies designed to lower the birth rate and mortality rate;

2) lowering the mortality rate and morbidity rate of mothers (pregnant and nursing women);

3) working to prevent communicable diseases.

The "Fifth Population and Health Five-Year Plan (1998 – 2003)" that serves as the action plan for the strategy takes into consideration an evaluation of the previously implemented "Fourth Population and Health Plan", and presents specific policies aimed at achieving the priority issues outlined above, through the cooperation of the Bangladesh Ministry of Health and Family Welfare and multiple donors such as the World Bank, UNICEF and other organizations, as well as of donors such as Japan and the U.S., and persons involved in NGOs.

With regard to 2), lowering the maternal mortality and morbidity rates, in particular, because at least 15% of all pregnancies and births involve serious complications that cannot be anticipated ahead of time, an approach has been adopted that "unless an environment is provided in which institutions providing emergency medical services are available to pregnant and nursing women, the maternal mortality rate will not decrease". To provide that environment, the Bangladesh Ministry of Health and Family Welfare has joined forces with UNICEF and other organizations to improve the quality of emergency obstetric care (hereinafter referred to as EOC) at District Hospitals (set up at one location in each district) and Thana Health Complexes (set up at one location in each area comprising a district, and provided with hospital functions) in each of the 64 districts making up the country, and to boost the rate of facility usage by pregnant and nursing women. "EOC" indicates the obstetrical medical care needed to sustain life in the event of an abrupt change in the condition of the pregnant or nursing woman, such as a sudden hemorrhage, toxemia, or communicable disease, and consists of the following classifications.

Comprehensive Emergency Obstetric Care (C-EOC): This is a system of comprehensive emergency care that includes Caesarian sections, blood transfusions and other services provided in the event of serious complications in the pregnant or nursing woman. Facilities providing this service are called C-EOC facilities.

Basic Emergency Obstetric Care (B-EOC): This is basic emergency obstetrical care provided for normal deliveries and minor perinatal care, and facilities providing this service are called B-EOC facilities.

The network of EOC services was constructed in all 64 districts based on the thinking that it was necessary to provide emergency medical care in order to sustain life in the event of the abrupt complications that emerge in at least 15% of all pregnancies, such as a sudden hemorrhage, toxemia, or communicable disease. Based on the number of pregnancies and births estimated to take place annually nationwide (approximately 2.1 million per year), facilities were established on a scale that would allow use by the 15% or more of pregnant women who develop serious complications, numbering approximately 315,000. To accommodate these numbers, the Ministry of Health and Family Welfare is aiming to erect facilities providing B-EOC services at four locations for a population of 500,000, along with one facility providing C-EOC services.

Specifically, under the "Fifth Population and Health Five-Year Plan (1998-2003), medical facilities are being planned for all 64 districts by the year 2003, as shown in the table below, and the provision of these facilities is currently underway with support from UNICEF, UNFPA, and other organizations, but because of severe financial limitations and other factors, the provision of supplies and equipment for Thana Health Complexes, which form the nucleus of regional medical care, is lagging far behind the target (100% provision by 2001).

Medical facility	Services provided	1999 target	2000 target	2001 target	2002 target	2003 target	Facilities provided as of 2001	Supporting organization	Aid provided
District Hospital (59 locations)	C-EOC	100% (59)					59% (35)	UNICEF	Equipment and instruments, personnel training, monitoring, other
Thana Health Complex (120 locations)	C-EOC	50% (60)	75% (90)	100% (120)			20% (24)	UNICEF	Equipment and instruments, personnel training, monitoring, others
Thana Health Complex (280 locations)	B-EOC	50% (140)	75% (210)	100% (280)			8% (23)	World Bank, etc.	Equipment and instruments provided as part of sector aid
Health & Family Welfare Center (4,770 locations)	Obs. First Aid	20% (954)	40% (1,908)	60% (2,862)	80% (3,816)	100% (4,770)	N.A.	World Bank, etc.	Equipment and instruments provided as part of sector aid
Maternal & Child Welfare Center (68 locations)	C-EOC		100% (68)				90% (61)	UNFPA	Equipment and instruments, personnel training, others

Given these circumstances, in June 2000 Bangladesh requested Japan to provide grant aid assistance for providing some of the equipment and instruments needed in order to establish and strengthen emergency medical care organizations in the 30 District Hospitals and 250 Thana Health Complexes in 54 districts in which refurbishment was behind schedule.

In response to the request submitted by Bangladesh in June 2000 for some of the equipment and instruments needed in order to establish and strengthen emergency medical care organizations in the Thana Health Complexes, the Japanese government decided to implement a preliminary study based on the District Hospitals and Thana Health Complexes at which there was judged to be a high degree of necessity for refurbishing an emergency obstetric care system, and Japan International Cooperation Agency (JICA) dispatched a preliminary study team from August 8 to September 12, 2001. The study team worked together with persons involved in the Bangladesh government and with UNICEF and other donors to formulate the background and contents of the plan through a local study, as well as compiling documents. The study team also drafted a report on the preliminary study through subsequent domestic analysis and a local explanation of a preliminary study overview implemented between November 16 and December 14, 2001.

As a result of the local study, it was found that the state of refurbishment of the emergency obstetric care system up to the current point in time was as indicated in the previous table (see the number of facilities refurbished by December 2001), and, based on funds provided by NGOs such as the Bill Gates Foundation, UNICEF is currently refurbishing equipment and instruments at District Hospitals in all of the districts and at one Thana Health Complex in each district as C-EOC facilities, but it has been confirmed that the goal of completely refurbishing the remaining Thana Health Complexes by 2001 is still far beyond reach.

Based on the results of the above study and other data, the contents of the plan were established as follows.

1) As a result of consultations held by the Ministry of Health and Family Welfare of Bangladesh with UNICEF and adjustments made in the cooperation of other donors, 47 C-EOC and 192 B-EOC Thana Health Complexes in 45 districts were targeted for cooperation (the areas within the double lines in the previous table are those at the target facility level).

2) Based on the functions, ranking, state of personnel arrangement and training, and current state of facilities and equipment at these target facilities, the upgrading and replacement of aging existing equipment and instruments, and the replenishment of insufficient equipment and instruments, were made a priority, and the necessity for and appropriateness of the state of personnel arrangement and other factors with respect to newly procured equipment and instruments (such as anesthesia machines) were thoroughly examined.

3) In order to provide comprehensive medical services such as Caesarian sections at C-EOC Thana Health Complexes, it will be necessary to provide personnel such as obstetricians, anesthesiologists, nurses and laboratory technicians. With UNICEF support, the Bangladesh Ministry of Health and Family Welfare is implementing a one-year training and study program at Dhaka Medical College Hospital etc., and the program is being implemented in response to a strong request by Bangladesh for the procurement of equipment and instruments in accordance with the schedule at which these personnel are assigned, and phasing in order to assure the effective utilization of the procured equipment. The phasing will be carried out in the following phases.

4) Phase I will target facilities at which obstetricians and anesthesiologists are already assigned, or are currently undergoing training and whose assignments have already been decided, while Phase II will target facilities at which obstetricians and anesthesiologists undergoing training subsequent to August 2002 will be assigned once their training is completed. The facilities targeted for planning are as follows, based on the implementation process.

	Phase I	Phase II	Total
Thana Health Complexes (C-EOC facilities)	27	20	47
Thana Health Complexes (B-EOC facilities)	64	128	192
Total	91	148	239

There is a large number of target facilities (sites) at 239, but because technical guidance is needed for persons running the equipment and carrying out maintenance at the various facilities, and those handling maintenance and control of the equipment, the procured materials will be distributed and transferred at the various target facilities (on-site at the sites).

Furthermore, in order to contribute to the smooth management and maintenance control of the equipment and instruments, refurbishing and repair tools will also be procured, targeting medical supply and repair centers (National Center in Dhaka and 19 District Centers in 18 districts).

The following table shows the contents, applications and procurement quantities for the principal equipment and instruments to be procured.

Equipment/ Instrument	Unit(s)	Application	C-EOC facility	B-EOC facility	Quantity procured		Total
					Phase I	Phase II	
Anesthesia machine	1	Used for general anesthesia in Caesarian sections, laparotomies, etc.	○		17	30	47
Labor table	1	Necessary for obstetrics	○	○	82	125	207
OT table	1	Necessary for emergency deliveries, surgeries, etc.	○		24	18	42
OT Light with Battery	1	Same as above	○		25	18	43
Instrument Sterilizer	1	Necessary equipment used for steam sterilization of surgical instruments	○	○	75	144	219
Electric Suction Pump(large, small)	Set of 1 large and 1 small	Necessary equipment for surgeries and deliveries; most existing equipment is aging and needs replacement	○	○ (large-sized only)	27 48	20 102	47 150
Episiotomy Set	2 sets; 1 pair per set	Instruments needed for episiotomies during delivery	○	○	54 64	40 128	94 192
Laparotomy set Including Caesarian Section Set	2	Equipment needed for Caesarian sections and emergency laparotomies; equipment needed at C-EOC facilities	○		54	40	94
Centrifuge Machine, Table Top	1	Compact desk-top type, used for general blood testing	○		27	19	46
Vacuum Extractor	1	Equipment necessary to extract fluids during delivery and for suction deliveries, etc.	○		27	20	47

Equipment/ Instrument	Unit(s)	Application	C-EOC facility	B-EOC facility	Quantity procured		Total
					Phase I	Phase II	
Generator	1	Equipment necessary for emergency surgeries, etc. if power fails	○		20	12	32
Pulse oxymeter (gauge for measuring saturation level of oxygen in blood)	1	Equipment used to monitor the level of oxygen in the patient's blood during surgery under anesthesia; indispensable when surgery is done under anesthesia	○		17	30	47
Infant warmer	1	Used to maintain body temperature in infants	○		27	20	47
Tool set for repair and maintenance	1	Used in maintenance and control of equipment (for equipment repair centers)			19		19

It would take approximately 23 months to implement the project, including the period for the implementation design. Because most of the equipment and instruments included in the project would be upgraded or replaced, the facilities at which the procured equipment and instruments would be set up and installed have already been, or are being, refurbished, and basic requirements such as water supply and drainage systems and electricity supply systems are already in place.

The overall implementation of the project would be handled by the Director, Primary Health Care and Communicable Disease Control, ESP, Directorate General of Health Services, the Ministry of Health and Family Welfare.

The Thana Health Complexes targeted by the project are run by Upazila(Thana) Health & Family Planning Officer (UH & FPO) appointed by MOHFW under supervision of District Civil Surgeon. Each project site has responsibility for maintenance and repair of the medical equipment supported by National Electro-Medical Equipment Maintenance Workshop & Training Center (NEMEW) at Dhaka and District Electro-Medical Equipment Maintenance Workshop (DEMEW) located in 18 districts.

The Thana Health Complexes targeted by the project basically provide diagnostic and treatment services, and the expenses for operation and for maintenance control are met entirely by the Ministry of Health and Family Welfare (at the District Hospital level, a collection system is already in place under which the recipients of medical diagnosis and treatment pay part of the cost). The operating and development budgets of the Ministry of Health and Family Welfare are increasing steadily, and the expenses for operation and for maintenance control of the Thana Health Complexes targeted for cooperation are covered entirely by the operating budget. It is anticipated that the operating budget will also be increased to cover the cost of upkeep and management of the procured equipment and instruments.

With regard to the physicians, nurses and other medical care technicians who utilize the equipment and instruments at the various Thana Health Complexes, personnel training programs are being comprehensively implemented with support from UNICEF, and because most of the

procured equipment and instruments consist of basic equipment and instruments that are already possessed by the facilities and are simply being upgraded and replaced, no problems are foreseen with the technical level of the personnel.

The results obtained through implementing the project can be organized as shown in the following table.

Current situation and problems	Project countermeasures (undertakings targeted for cooperation)	Project results / degree of improvement
Because there are few facilities that can provide emergency obstetrics services for pregnant and nursing women in the 45 districts targeted for cooperation, pregnant and nursing women are unable to utilize these facilities, resulting in high mortality and morbidity rates for these women.	The necessary equipment and instruments at a targeted 47 Thana Health Complexes providing C-EOC services in 45 districts will be refurbished, as will the necessary equipment and instruments at a targeted 192 Thana Health Complexes providing B-EOC services.	The project will enable approximately 1.66 million pregnant and nursing women (an estimated 250,000 of whom have serious complications) in the 45 districts targeted for cooperation to utilize emergency obstetrics care services. This will contribute to lowering the maternal mortality and morbidity rates, and pediatric-related equipment such as warmers will make it possible to manage the body temperatures of infants and other types of care, helping to lower the infant mortality rate. Also, as a secondary result, because the project equipment and instruments are basic equipment and can also be used in fields outside of obstetrics, the project will contribute to improving basic medical services for the general population in the target area.
When medical personnel (midwives and other birth assistants) being trained by the “Development of Technical Resource Personnel in Reproductive Health”, a project-type cooperation currently being implemented, are assigned to the various facilities where the necessary equipment and instruments are not available, and services cannot be provided.	Same as above	Medical personnel (midwives, etc.) trained through project-type technical cooperation will be assigned to facilities targeted by the project, and will use the procured equipment and instruments, heightening the support efficacy.

The project has been evaluated as being an appropriate venue for grant aid assistance by Japan, based on a review of the results of items (1) to (5) below.

(1) The facilities targeted for cooperation consist of Thana Health Complexes in 45 of the country's 64 districts. They provide primary and secondary medical care, and are medical facilities that serve as the basis of the medical care system in Bangladesh. The project will benefit the local population, including 1.66 million (estimated annual figure) pregnant and nursing women in the 45 districts who will benefit directly from the project, and 83 million people, primarily in the poverty class, who will benefit indirectly.

(2) The project is directly tied to lowering the maternal mortality and morbidity rates (those for pregnant and nursing women), which is the foremost priority of the Health and Population Sector Strategy, and will contribute to achieving the goals of Bangladesh's mid- and long-term development planning.

(3) Many of the target facilities are located in small local cities and towns, and in addition to minimizing the gap between medical services provided in urban and local areas, and by refurbishing the medical system involving maternal care, the project will be linked to holding down the population, which is the foremost issue for Bangladesh, where the number of planned births has been rising. The project is thus one that will contribute to stabilizing the civil government of Bangladesh and to improving the lifestyle of the people.

(4) As described earlier, it is anticipated that ample use can be made of the procured equipment and instruments. In addition, because the project targets mainly the upgrading of equipment and instruments that involve very few maintenance expenses and are already owned, Bangladesh will be able to handle operation and maintenance control using its own funds, human resources, and technology, and a high level of sophisticated technology will not be required.

(5) Because most of the project equipment and instruments will be upgraded or replaced, the facilities at which the procured equipment and instruments would be set up and installed have already been, or are being, refurbished, and basic requirements such as water supply and drainage systems and electricity supply systems are already in place. The Bangladesh Ministry of Health and Family Welfare has already been the recipient of grant aid assistance from Japan in the past, and no problems are foreseen with respect to implementing the project under Japan's system of grant aid assistance.

The issues listed below must be addressed by Bangladesh in order to make maximum use of the equipment and instruments procured through the implementation of the project and to achieve and sustain the resulting effects.

(1) The continuation of the health and medical policies of Bangladesh

The current policies, which target the integration of health and population policies and are aimed at providing the people with the necessary health and medical services (Essential Service Package), as well as at suppressing increases in the population, must be maintained by Bangladesh with cooperation from the World Bank and other donors.

(2) The establishment of administrative systems for public medical institutions and the establishment of budgets and finances for health and medical care

The Ministry of Health and Family Welfare needs to set up administrative systems for public medical institutions and to provide the necessary medical personnel, along with allocating the necessary budgets. In particular, because the budget allocations for Thana Health Complexes are less sufficient than those for other medical institutions due to harsh financial circumstances, the Ministry needs to strive for improvements such as having the recipients of medical care pay part of the cost.

(3) The elimination of various factors that hinder access to medical institutions, and the boosting of the degree of utilization

The Ministry of Health and Family Welfare must continue to promote policies designed to facilitate changes in the action and behavior of local societies, including those of pregnant and nursing women (such as education that encourages the use of facilities and instructional activities that teach the population about hygienic and safe births), in order to boost the rate of utilization of medical institutions by local residents.

CONTENTS

Chapter 1 Background of the Project

Chapter 1 Background of the Project

The People's Republic of Bangladesh is a rising nation who came into being as a sovereign state in 1971 separated from Pakistan.

During the British colonial regime,which had occupied sub-continent since 1876, Bangladesh consisted a part of Bengal and Assam province, and attained its independence in 1947 from British rule as a part of Pakistan called East Pakistan, and finally came into being as a sovereign state in 1971.

Soon after came into being as a sovereign state, Bangladesh made her full efforts for improving health situations and high population growth problems by preparing and implementing successive planns/programs supported by donors, which shown in Table-1.

Although Bangladesh attained some improvements, shown in Table-2, it is necessary for her to make more efforts to improve her health situations compared with neighboring countries as shown in Table-3.

Table-1 Past and Present Projects/Program of Health Sector in Bangladesh

The First Population Project	1975-1980	Re-establishing a physical infrastructure for family planning service delivery which had been greatly damaged during the war for independence in 1971
The Second Population and Family Health Project	1980-1986	Strengthening family planning services for achieving the national family planning program
The Third Population and Family Welfare Project	1986-1991	Strengthening family planning services along with reduction of infant mortality
The Fourth Population and Health Project (FPHP)	1992-1998	Not only strengthening family planning services but also further including projects for strengthening maternal and child health services and disease control activities
The Fifth Health and Population Sector Program (FHPP)	1998-2003	Implementation plan of the Government developed the Health and Population Sector Strategy (HPSS) which formulated in consultation with donors to reform the health and population sector to provide a package of essential health care services for the people and to reduce population growth rate based on reviews of the Fourth Project, and strongly supported by donors. A feature of HPSS is the transition from a project driven approach under the Fourth Project to a programme integrated health and family planning that links a sector-wide policy framework to an immplementation and expenditure plan for the sector.

Table-2 Key Health Indicators of Bangladesh

Indicator	1990 Results	1995 Targets	1995 Estimated Results	2002 Targets	2005 Targets
Population(Million)			122.0	132.5	137.5
Cryde Birth Rate(CBR)	33.50	28.90	27.50	22.00	21.00
Crude Death Rate(CDR)	12.00	10.70	9.00	7.80	7.80
Population Growth Rate(%)	2.15	1.82	1.85	1.32	1.32
Infant Mortality Rate(IMR)	94.00	80.00	78.00	55.00	50.00
Maternal Mortality Rate(MMR)	6.00	4.50	4.50	3.00	
Contraceptive Prevalence Rate(CPR)	39.00	50.00	48.00		
Total Fertility Rate(TFR)	4.90	4.00	3.40	2.60	2.20
Expectation of Life at Birth	54.00	58.00	58.00	60.00	62.00
Population covered under Essential Health Care(% of Population)	50.00	80.00	45.00	70.00	
Immunization(% coverage-all)	75.00	85.00	66.00		
Antenatal Care(% coverage)%	45.00	60.00	35.00	80.00	
Diarrhoea Prevention	90.00	90.00	66.00	90.00	
Tnberculosis Prevention	20.00	50.00	30.00	100.00	
Nutrition(calorie intake)	1850	2100	1950	2300	

Table-3 Health Situation of Bangladesh compared with Neighboring Countries etc

	Bangladesh	India	Sri Lanka	Pakistan	Developed Countries	Developing Countries
Expectation of Life at Birth (Male/Female)	58.1 / 58.2	62.3 / 62.9	70.9 / 75.4	62.9 / 65.1	71.1 / 78.8	61.8 / 65.0
Infant Mortality Rate(IMR)	79	72	18	74	9	63
Maternal Mortality Rate(MMR) (per 100,000birth)	850	437	30	340	13	470

Bangladesh formulated and implemented her Fifth Five Year Plan (FFYP) (1997-2002) and one of the main objectives of the FFYP is to ensure the people to access essential health care services of acceptable quality and to further reduce population growth rate. Reduction of infant mortality and morbidity, reduction of maternal mortality and morbidity, improvement of nutritional status and fertility so as to reach the replacement-level fertility growth by the year 2005 will remain the most important basis of the FFYP.

The Health and Population Sector Strategy (HPSS) was formulated on 1997 in consultation with donors which reflected the results of FPHP to reform the health and population problems. The main sectoral objectives of the HPSS are follows.

* Maintenance of momentum of efforts in Bangladesh to lower fertility and mortality
* Reduction of maternal mortality and morbidity
* Reduction in the burden of communicable diseases

For achieving the HPSS, Bangladesh Government formulated Health and Population Sector Program (HPSP), sector investment plan , commencing on 1998 and ending on 2003. The main

purpose of HPSP is contribute to improvement of the health and family welfare status among the most vulnable women, children and poor. A number of programs in other key sectors like education implemented through Bangladesh will contribute to achieve of this goal along with HPSP.

HPSP is consist of following 8 conponent.

① *Essential Service Package defined, funded, promoted and implemented

② Services delivery mechanism unified, restructured and decentralized

③ Integrated support systems strengthened

④ Hospital level services focused and improved

⑤ Sector-wide programe management system established and operational

⑥ Policy and regulatory framework strengthened

⑦ Other services of public health importance strengthened

⑧ Other health and nutrition services strengthened

*Essential Service Package is a standard set of services made available at every level of service infrastructure and the structure of ESP under implementation are as follows.

Major areas	Sub-areas
Reproductive Health Care	1. Safe motherhood 2. Family Planning 3. Prevention and control of RTI /STD /AIDS 4. Maternal nutrition 5. Adolescent care 6. Infertility 7. Neo-natal care
Child Health Care	1. ARI 2. Diarrhoeal Diseases 3. EPI 4. Vit.A
Communicable Disease Control	1. TB 2. Leprosy 3. Malaria 4. Filaria 5. Kala-azar 6. Intestinal parasites 7. STDs/ RTIs (HIV /AIDS) 8. Other emerging and re-emerging disease
Limited Curative Care	1. Basic first aid 2. Medical emergencies 3. Pain relief and advice
Behaviour Change Communication	1. Social change 2. Social ownership 3. Provider relations 4. Advocacy 5. ESP intervention program 6. Social marketing

And some of the key indicators to be used for monitoring of implementation activities of HPSP are defined as follows.

Reduction in	Maternal mortality
	Infant mortality
	Mortality for female and male children under 5
	Communicable diseases
	Unwanted fertility and reduction of total fertility rate
Increase/Improvement in	Life expectancy for females and males
	Age of women at birth of first child
	Nutritional status
	Healthy life style

The progress was satisfactory with respect to reduce in fertility and child mortality, while the progress was unsatisfactory with respect to maternal mortality and morbidity due to early marriage and pregnancy, strong preference for sons among the society and requested so many pregnancies to get son, difficult to avoid the incidence of unwanted pregnancy, the discrimination against female and female children in the provision of food and in health-care-seeking behavior, and only 25% of pregnant women receive antenatal care and few institutional deliveries (about. 95% of birth proceeded by home) and only 14% of births are attended by trained personnel.

Table-4 Mean age at marriage(Female) and Age-specific fertility rates per 1000women

	Mean age at marriage	Total fertility rate per woman	15-19year old	20-24year old	25-29year old	30-34year old	35-39year old
1974	15.9	N.A	N.A	N.A	N.A	N.A	N.A
1981	17.8	N.A	N.A	N.A	N.A	N.A	N.A
1991	18.1	4.24 (4.48)	77 (84)	234 (253)	227 (246)	153 (163)	106 (114)
1994	19.8	3.58 (3.79)	56 (60)	205 (214)	207 (211)	126 (136)	98 (108)
1996	20.0	3.41 (3.76)	52 (56)	199 (210)	203 (208)	120 (132)	88 (102)

Notes：（Rural area）

During FPFH period, under different projects, namely, EOC Project (UNICEF assisted and OBGY Society Bangladesh implemented), TFIPP Project (assisted by Germany etc) etc were implemented by DGHS and MCH Strengthening Project (UNFPA assisted) etc were also implemented by DGFP. However , the strengthening was not uniform l y made in all areas and to bring the desired outcomes.

Under these circumstances, maternal mortality and morbidity is also considered as a key indicators of Gender Issues, donors strongly requested Bangladesh for making further efforts to reduce . The Government put the first priority for the reduction of maternal mortality and morbidity, and made strong efforts to reduce for placing Reproductive Health Care for top of ESP.

The services under reproductive health care of ESP will be aimed for ensuring safe pregnancy and delivery, including fertility regulation and treatment of abortions, avoiding unwanted pregnancies and postpone births, managing reproductive morbidity and mortality, including STD / HIV, and other aspects of sexual and reproductive health among adults and adolescents. To date there has been insuficient attention given to maternal care and although the physical infrastructure is in place, the concepts of the Safe Motherhood Initiative and the provision of Essential Obstetric Care (EOC) have only been implemented on a limited scale. ESP will provide increasingly sophisticated services at each level of the system, with a capacity to perform caesarean sections and blood transfusion at specified Thana Health Complexes (THCs), Maternal and Child Welfare Centers (MCWCs) and all District Hospitals.

Based on above concept, Implementing Agency, Director Primary Health Care & Communicable Disease Control, ESP, under the Directorate General of Health Services (DGHS) of The Ministry of Health and Family Welfare (MOHFW) has prepared implementation program for achieving to reduce the maternal mortality to below 2 per thousand live birth by 2003 and to increase utilization of EOC services from 26% in 1999 to 80% in 2003, by making 59 District Hospitals and 120 THCs by providing Comprehensive EOC services (C-EOC services), which include caesarean sections and blood transfusion, and 282 THCs for providing Basic EOC services (B-EOC services) by close cooperation with UNICEF who has supported EOC services in Bangladesh starting from 1993.

Hence, as explained in the above, the Government of Bangladesh has made a request to the Government of Japan for its grant aid assistance for procuring and installing equipment for 30 District Hospitals and 250 THCs which provide C- EOC services and B-EOC services.

Upon this request, the Government of Japan sent Study team in August of 2001 to study its relevance and related development plan and projects, feasibility and appropriateness as a project, and accordingly decided a policy to perform basic design and its implementation.

The objectives of the Project are to achieve the target of the HPSP by establishing “functioning” facilities for EOC services, increasing coverage and utilization of Emergency Obstetric Care (EOC) services shown in Table-5 and 6, by supplying and installing essential equipment/instruments for EOC services to the District Hospitals and THCs.

Table-5 Target for establishing “functioning” facilities at different level

Facility	Target level	%currently at target level	1999 target	2000 target	2001 target	2002 target	2003 target
Health & Family Welfare Center (H&FWC) (4,770)	Obstetric First Aid	0%	20% (954)	40% (1,908)	60% (2,862)	80% (3,816)	100% (4,770)
	WFHI	0%	10%	30%	60%	80%	100%
Thana Health Complex (THC) (280)	B- EOC	10-20%	50% (140)	75% (210)	100% (280)		
	WFHI	0%	10%	30%	60%	80%	100%
District Hospital (DH) (59)	C-EOC	70% (41)	100% (59)				
	WFHI	0%	20%	50%	75%	100%	
Thana Health Complex (THC) (120)	C-EOC	5-10% (6-12)	50% (60)	75% (90)	100% (120)		
	WFHI	0%	30%	60%	8%	100%	
Maternal & Child Welfare Center- (MCWC) (59+9)	C-EOC	86% (59)		100% (68)			
	WFHI	0%	40%	75%	100%		

Note：WFHI means “Women Friendly Hospital Initiative”

Table-6 Target for service utilization

Indicator of utilization	Current level	1999 Target	2000 Target	2001 Target	2002 Target	2003 Target
% of expected omplications availing services	5-10%	20%	50%	60%	70%	80%
% of pregnancies receiving ANC	25%	35%	40%	50%	75%	50%
% of births conducted by trained personnel	10%	15%	25%	35%	45%	50%
% of post-partum women being visited by FLW in 48 hrs. on birth	2%	20%	40%	60%	80%	

And present situations of EOC services are shown in Table-7.

Table-7 Present situations of EOC services.

	Baseline Survey of 1994	Review of EOC Services1999 (Oct/98-Sept/99Survey)
Distribution of Facilities surveyed	Medical College Hospitals(MCH) District Hospitals MCWCs THCs FWCs	Medical College Hospitals(13) District Hospitals(59) MCWCs(62)(55District,7Others) THCs(104,incl 40 C-EOC designated) FWCs Private & NGO Clinics/Hospitals(472)
Amount of EOC Services 1.Existing EOCFacilities	C-EOC 30 Facilities B-EOC 99Facilities 1 C-EOC for 3,938,700 Population 1-B-EOC for 1,312,900 Population	Findings are as follows C-EOC B-EOC MCH 100%(13) 100%(13) DHs 59.3%(35) 13.5%(8) MCWCs 27.4%(17) 19.4%(12) THCs C-EOCdesignated 5%(2) 27.5%(11) C-EOC not desig 1.6%(1) 35.9%(23) Priv/NGO 41.7%(197) 5.7%(27) (Total Facilities) (265) (81) Based on the findings, it is estimated that Govet.Facilities which provide C-EOC are 68 and which provide B-EOC are 115. Using the mid year of population of 1998 and birth rate of that year were 126,130,000 and 19.9 per thousand,the positions of the Govet. Facilities compared with the Guidelines (1 C-EOC and 4 B-EOC for 500,000) are as follows. C-EOC B-EOC Existing Facilities 68 151 Target Facilitis 252 1,008 Met rate 26.98% 14.98% Needs Faclities 184 857 1 C-EOC for 1,856,000 population 1 B-EOC for 835,000 population
2.Institutional Deliveries	Institutional Deliveries were estimated as 2.2% of total deliveries	Distribution of Deliveries (Facilities)(No. of deliveries) (%) MCHs 36,908 17.81% DHs 29,370 14.17% MCWCs 30,230 14.58% THCs(C-EOCdesig) 4,096 1.98% THCs(C-EOC not desg)33,316 16.07% All GOB施設 133,920 64.62% Priv/NGO 73,329 35.38% (total) (207,249) (100.0%)

	Baseline Survey of 1994	Review of EOC Services1999 (Oct/98-Sept/99Survey)
		Using the mid-year population and birth rate of 1998,total estimated births are 2,509,988. Based on this, it is seen that deliveries in the Govt.Facilities are counts for 5.33% of total deliveries. Deliveries in Private/NGO Facilities aew 2.93%. Total institutional deliveries are estimated 8.26% and this figure is far below the target/minimum required figure 15% Percentage distribution of type of deliveries by facility are as follows. MCHs 47.3% 5.1% 47.6% DHs 79.6% 2.7% 17.7% MCWCs 86.2% 3.6% 9.9% THCs 96.2% 3.7% 0.1% Priv 53.5% 4.2% 42.4% (All) (65.5%) (3.9%) (30.6%)
3.Obstetric Complications treated at different facilities	Percentage of Obstetric Complications treated at different facilities were estimated as 5.1% and also estimated as 0.7% of total deliveries	Distribution of Obstetric cases that sought treatment for Complications at sample facities are as follows. Septic and non-septic abortion 27.9% Obstructed/Prolonged Labour 16.1% Eclampsia/Pre-eclampsia 16.1% Retained Placenta 6.2% Antepartum Haemorhage 5.9% Others 27.8% (total) (100.0%) Percentage distribution of Obstetric Complications treated by type of facilities are as follows. MCHs 31.3% DHs 16.1% MCWCs 7.9% THCs 17.6% Pri/NGO 27.1% (total) (100.0%)
		No. of Obstetric Complications treated by sample facilities are 99,780 (Govt.facilities 72,505 and Private/NGO facilities 27,275). Based on the estimation that 15% of total deliveries are necessary for treatment of Obstetric complications, the latent demands for treatment are calculated to 376,498. It is found that Govt.facilities treated 19.3% of the minimum expected Obstetric Complications. Another 7.2% of the minimum expected complications are treated at Private/NGO, giving a total of 26.5% of the minimum expected complication treated at facilities.

<table>
<tr><th></th><th>Baseline Survey of 1994</th><th>Review of EOC Services1999
(Oct/98-Sept/99Survey)</th></tr>
<tr><td></td><td></td><td>Obstetric Complications treated by facilities are estimated 3.97% of total deliveries.
Compare with the baseline figures,5.1% and 0.76% respectively, these figures are improved but still under target.</td></tr>
<tr><td>4.Caesarean Section</td><td>Proportion of Caesarean Sections was 4.7% of estimated requirements and 0.23% of total deliveries.</td><td>Proportion of Caesarean Sections that performed at different facilities during Oct.1998 to Sept.1999 are as follows.
<table><tr><th></th><th>Deliveries</th><th>Caesarean</th><th>%</th></tr><tr><td>MCHs</td><td>36,908</td><td>17,580</td><td>31.5%</td></tr><tr><td>DHs</td><td>29,370</td><td>5,191</td><td>9.3%</td></tr><tr><td>MCWCs</td><td>30,230</td><td>2,068</td><td>3.7%</td></tr><tr><td>THCs</td><td>37,412</td><td>11</td><td>0.1%</td></tr><tr><td>Priv/NGO</td><td>73,329</td><td>31,231</td><td>55.4%</td></tr><tr><td>(total)</td><td>(207,249)</td><td>(56,081)</td><td>(100.0%)</td></tr></table>
Of the total estimated annual birth Caesarean Sections account for 2.23%.
Compared with the latent demands/ target which was estimated 5% of total deliveries, its account for 44.7% and below the target.
Proportion of Caesarean Sections that performed at Govt.facilities is estimated 0.99% and increased compared to 0.79% of baseline figures.</td></tr>
<tr><td>5.Case Fatality Rate</td><td>Case Fatality Rate 2.6</td><td>Case Fatality Rate by type of facility during survey term were estimated to be 2.24 in Medical College Hospitals, 4.22 in the DHs, 0.53 in MCWCs, 1.75 in THCs and 0.77 in Private. The total Case Fatality Rate was found to be 2.24 and decreased from baseline survey but is more than double of the maximum acceptable level/target of 1%.
Percentage distribution of maternal deaths by causes is as follows.
<table><tr><td>Eclampsia/Pre-Eclampsia</td><td>33.7%</td></tr><tr><td>PPH</td><td>10.6%</td></tr><tr><td>APH</td><td>8.4%</td></tr><tr><td>Obstructed/Prolonged Labour</td><td>7.7%</td></tr><tr><td>Rupture Uterus</td><td>5.0%</td></tr><tr><td>Septic Abortion</td><td>3.7%</td></tr><tr><td>Post-partum/Puerperal sepsis</td><td>3.3%</td></tr><tr><td>Others</td><td>27.6%</td></tr><tr><td>(total)</td><td>(100.0%)</td></tr></table></td></tr>
</table>

Chapter 2　Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

1. Overall goal and project purpose

One of the foremost priorities of the Fifth Health and Population Five-Year Plan (Health and Population Strategy, or HPSP) is to significantly reduce maternal (pregnant women and nursing mothers) mortality and morbidity rates. Statistics show that at least 15% of all pregnant women experience severe and unpredictable complications in their pregnancies. It is thought that three major elements are necessary in order to lower the mortality and morbidity rates for mothers (pregnant women): (1) the nationwide provision of (assurance of access to) facilities that can provide the emergency obstetrical care (EOC services) necessary in order to sustain life when there has been an abrupt change in the condition of a pregnant woman caused by a sudden hemorrhage, toxemia, communicable disease, or other factors during the pregnancy; (2) provision of the necessary supplies and equipment to the EOC service facilities (improvement of the quality of services); and (3) boosting the usage rate of EOC services by measures such as instructional activities that target the populations in local areas (appropriate use of services).

In order to achieve these aims, the Ministry of Health and Family Welfare of Bangladesh is planning to set up one C-EOC facility and four B-EOC facilities for each population segment of 500,000 people, in 64 districts nationwide, so that such facilities will be adequate to accommodate all pregnant women and the 15% of pregnant women, or approximately 315,000 women, having serious complications, based on an anticipated annual number of pregnancies nationwide (approximately 2.1 million per year). As indicated in Table 5 (see page 4) showing the purpose of the EOC services to be provided at the various medical facilities, the Ministry is currently implementing the planning with support from UNICEF and UNFPA, and based on a local study, the following has been confirmed to be the current situation.

Table-8 Current situations of the Project

Facilities that need to be provided (medical facility)	Content of services provided	Target by 2001	No. of facilities provided to date (2001)	Supervising bureau of Ministry of Health and Family Welfare	Supporting organization	Aid provided
District Hospital (59 locations)	C-EOC	59	35	Health Bureau	UNICEF	Equipment, personnel training, other
Thana Health Complex (120 locations)	C-EOC	120	24	Health Bureau	UNICEF	Equipment, personnel training, other
Thana Health Complex (280 locations)	B-EOC	280	23	Health Bureau	World Bank, etc.	Equipment and instruments provided as part of sector aid
Health & Family Welfare Center (4,770 locations)	First aid	Not yet decided	N.A	Health Bureau	World Bank, etc.	Equipment and instruments provided as part of sector aid
Maternal & Child Welfare Center (68 locations)	C-EOC	68	61	Family Planning Bureau	UNFPA	Equipment, personnel training, other

The purpose of the project is to improve the medical services provided at these facilities, targeting the 239 Thana Health Complexes at 239 locations in 45 districts (C-EOC Thana Health Complexes at 47 locations and B-EOC Thana Health Complexes at 192 locations) that cannot be covered by Bangladesh through its own budgets or through cooperation provided by UNICEF and other donor organizations.

2. Project overview

Through this project, in order to achieve the purpose outlined above, Bangladesh will train and assign the necessary personnel such as obstetricians and anesthesiologists (personnel resource investment) and procure the supplies and equipment necessary in order to provide EOC services through grant aid from Japan (commodities investment), and will set up Thana Health Complexes at 239 locations. As a result, the EOC services provided at the Thana Health Complex level will be improved, and an environment will be created in which pregnant women can be assured of receiving diagnostic services and medical care in the 45 districts targeted by the project. Activities targeted by the cooperation will include the procurement of supplies and instruments necessary for basic obstetrical care, including the supplies and materials necessary for complex obstetrical care such as Caesarian sections, blood transfusions and other procedures, among them anesthesia equipment and pulse oxymeters, at C-EOC Thana Health Complexes at 47 locations, and providing delivery tables, steam sterilizers and other equipment at B-EOC Thana Health Complexes at 192 locations.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

Design concept for this project is mentioned hereunder as follows.

1) Basic Concept

Basic concept for Level of Emergency Obstetric Care (EOC) services and Service Provider, Selecting Project Sites, Timing at which implementation will be undertaken, Distribution and transfer of equipment, and Selecting criteria for Equipment are as follows.

(1) Level of Emergency Obstetric Care (EOC) service and Service Provider

The Ministry of Health and Family Welfare, UNICEF, and UNFPA etc defined and monitored the Level of Emergency Obstetric Care (EOC) service and Service Provider as following categories as shown in Table-8.

And Table- 9 shows the Selection criteria and Monitoring indicator for Service Provider for the Project.

Accordingly, these definitions, criteria and indicators should be followed in the Basic Design.

Table- 9 Level of Emergency Obstetric Care Services and Service Provider

Level of Emergency Obstetric Care Services and its Functions/Elements	Service Provider (Facility)
*C-EOC -All basic EOC functions -Surgery/Caesarean section -Blood transfusion	District Hospital (59) Thana Health Complex (planned120 Present plan123) Maternal & Child Welfare Center
*Basic-EOC -Oxytocics(injectable) -Antibiotics(injectable) -Anticonvulsas(injectable) -Manual removal of placenta -Assisted vaginal delivery *Vacuum extraction *Refer and arrange transport	Thana Health Complex (280)
*Obstetric First Aid -Oxytocics(injectable) -Antibiotics(injectable) -Anticonvulsants(injectable) *Menstrual Regulation *Refer and arrange transport	Health & Family Welfare Center(Union level)
*Community education: -recognition of complications -when to seek medical care -where to go for medical care *Community mobilization -arrange transport and finance -arrange for blood donors	(Community/Village level)

Table-10 Selection criteria and Monitoring indicator for Service Provider

Amount of essential obstetric care(EOC) Basic EOC facilities Comprehensive EOC facilities	For every 500,000 population, there should be: At least 4 Basic EOC facilities At least 1 Comprehensive EOC facility
Geographical distribution of EOC facilities	Minimum level for amount of EOC services is met in subnational areas
Proportion of all births in Basic and Comprehensive EOC facilities	At least 15% of all births in the population take place in either Basic or Comprehensive EOC facilities
Met need for EOC: Proportion of women estimated to have Complications who are treated in EOC Facilities	At least 100% of women estimated to have obstetric complications are treated in EOC facilities
Caesarean sections as a percentage of all births	As a proportion of all births in the population, Caesarean sections account for not less than 5% nor more than 15%
Case fatality rate	The case fatality rate among women with obstetric complications in EOC facilities is less than 1%

(2) Selecting Project Sites

With respect to the sites targeted for cooperation, because the Columbia University / Bill Gates Foundation in the U.S. is already providing the equipment necessary for supplying C-EOC services at all district hospitals and at one Thana Health Complex in each district through UNICEF, Thana Health Complexes other than these will be targeted for cooperation.

Ultimately, Thana Health Complexes at 47 locations in 40 districts will be targeted for cooperation as C-EOC facilities, and Thana Health Complexes at 192 locations in 45 districts as B-EOC facilities.

Moreover, the NEMEW&TC and DEMEW noted earlier, which are handling the repair and installation of medical equipment and supplies at all of the government-related medical facilities in Bangladesh, are unable to provide satisfactory maintenance and control services because of a lack of tool sets for repairs, and because manuals for refurbishing the relevant medical equipment and supplies have not been distributed. Given that these facilities are responsible for handling maintenance and repair of the equipment and supplies at the Thana Health Complexes targeted by the project, tool kits for these facilities are being planned, along with the distribution of manuals for operation inspections and repair of the planned equipment and materials and other steps.

(3) Timing at which implementation will be undertaken

With respect to C-EOC facilities, personnel such as obstetricians and anesthesiologists are necessary in order to provide the planned complex medical services such as Caesarian sections. The Ministry of Health and Family Welfare with support from UNICEF, is implementing a one-year program of education and training at Dhaka Medical College Hospitals and other institutions. Given that the Bangladesh side is strongly requesting the procurement of equipment and materials in keeping with the schedule at which these personnel will be assigned, and to assure the effective utilization of the procured materials, Phase I will target C-EOC facilities at which obstetricians and anesthesiologists have already been assigned, and Phase II will target C-EOC facilities at which obstetricians and anesthesiologists will be assigned who are currently undergoing training. Based on this, B-EOC facilities will be refurbished at sites in the same districts as the C-EOC facilities targeted for refurbishment, at the same timing.

(4) Distribution and transfer of equipment

There is a large number of recipient facilities at 239, but because technical guidance is needed for persons running the equipment and carrying out maintenance at the various targeted facilities, and for persons in charge at NEMEW&TC and DEMEW where maintenance and repair of the medical equipment and supplies are being carried out, the procured materials will be distributed and transferred at the various recipient facilities (on-site at the sites).

(5) Selecting criteria for Equipment

Table-11 shows equipment to be provided under the Grant Aid after the series of discussions with Bangladesh and UNICEF, subject to equipment to be included in the Project will be decided after further studies. And the following Selecting criteria are agreed between Bangladesh side and Study team.

Table-11 Equipment to be provided for Project

For C-EOC Project Site	For B-EOC Project Site	Name of Equipment
C-1		Anaesthesia Machine with O2 & N2O Cylinder
C-2	B-1	Labour Table
C-3	B-2	Laryngoscope
C-4		OT Table
C-5		OT Light with Battery
C-6	B-3	Autoclave
C-7	B-4	Sterilising Drum S,M,L
C-8	B-5	Instrument Steriliser
C-9	B-6	Electric Suction pump
C-10	B-7	Ambu Bag
C-11	B-8	Cylinders (with Oxygen Therapy Unit)
C-12	B-9	Baby Weighing Scale
C-13	B-10	Episiotomy Set
C-14		Laparotomy Set including Caesarian Section Set
C-15	B-11	Neonatal Resuscitator/Laryngoscope
C-16	B-12	Uterine Evacution Set
C-17		Anaesthesia Table
C-18	B-13	Instrument Trolly
C-19	B-14	Instrument Table (Mayo type)
C-20	B-15	Instrument Tray
C-21	B-16	Revolving Stool
C-22	B-17	Stand (Bowl)
C-23	B-18	Basin (S/S Bowl)
C-24-1		Centrifuge Machine,Table Top
C-24-2		Hematocrit Centrifuge
C-24-3		Binocular Microscope
C-24-4		Blood Cell Counter,Manual type
C-24-5		Photo Colorimeter
C-24-6		Refrigerator for Reagents
C-25	B-19	Stabilizer
C-26	B-20	Examination Light
C-27	B-21	Vacuum Extractor
C-28	B-22	Patient Examination Table
C-29	B-23	Stretcher with Trolly
C-30	B-24	Wheel chair
C-31	B-25	Mercury Sphygmomanometer, Stand type
C-32	B-26	Stethoscope

For C-EOC Project Site	For B-EOC Project Site	Name of Equipment
C-33	B-27	Fetal Stethoscope
C-34		Air Conditioner
C-35		Generator, max. 6KVA
C-36	B-28	Instrument Cabinet
C-37		Pulse Oxymeter
C-38		Fetal Doppley
C-39		Exhaust Fan
C-40	B-29	Partitions (3 Pannels)
C-41	B-30	Height and Weighing Scale
C-42	B-31	Portable Weighing Machine
C-43		Infant Warmer

Criteria to select the Equipment

Basic Criteria for Selecting the Equipment

Criteria for giving high priority

(1) Equipment that is to be replaced for existing old/decrepit equipment

(2) Equipment that is to be supplemented for the equipment lacking distinctly in its quantity

(3) Equipment that is required for basic hospital treatment/diagnosis

(4) Equipment that easy to operate and maintain

(5) Equipment that may give big benefit/effect to hospital

(6) Equipment that is highly cost-effective

(7) Equipment that is proven for medical usefulness(necessity)

Criteria for giving low priority

(1) Equipment that requires high operation and maintenance cost

(2) Equipment that has limited benefit/effect to hospital

(3) Equipment that lowly cost-effective

(4) Equipment that is not for treatment/diagnosis use but for academic research purposes

(5) Equipment that can be substituted with a simple ones

(6) Equipment that may cause environmental pollution by its medical waste etc

(7) Equipment that is not proven for its medical usefulness (necessity)

(8) Equipment that is for personal usage by hospital staff (not medical use)

(9) Equipment whose quantity is more than necessity (inefficient ,duplicated equipment)

Additional Criteria for Selecting the Equipment (after Field survey and considering of the conditions of recipient side)

Additional Criteria for giving high priority

(1) Equipment that can be operated by hospital's current technical capabilities

(2) Equipment that bee operated/maintained by hospital staff assigned or to be assigned

(3) Equipment that matches with hospital's social position/function (referral system ,local needs)

Equipment that can be expected useful with the one provided by other donors

Additional Criteria for giving low priority

Equipment that is difficult to procure its spare parts and consumable locally

Equipment that cannot be operated by hospital's current technical capability

Equipment that seem to be difficult to operate/maintained by present hospital's staff

Equipment that dose not match with hospital's social position/function (referral system, local needs)

Equipment that requires large scope of infrastructure work (water, electricity supply, drainage,etc) for its installation

Equipment that can be substituted by existing equipment

Equipment that is duplicated with other donor's assistance

Equipment that has already decided to procure or secured the budget

Equipment that is easily purchases from the local market by own budget

<u>Criteria when International Standard exists</u>

Standard of WHO(ex X-ray equipment, etc) is applicable on case by case basis

2) Concept for natural conditions

Bangladesh lies in the north eastern part of South Asia between 20 ° 34' and 26 ° 38'north latitude and 88 ° 01' and 92 ° 41' east longtiude. It is bordered on the west, north and north-east by India, on the south-east by Myanmmar and on the south , by the Bay of Bengal.

The area of the country is 143,999 square kilometers and the population is about 132 million.

Except comparatively small areas such as the hilly region in the nort-east, the south-east and in part of north and north-west, the country is mainly a low flat and fertile land divided by a network of rivers. The major rivers are : the Padma, the Teesta, the Brahmaputra, the Suruma, the Meghna and the Karnaphuli. Their tributaries crisscross the country covering 24,140 kilometers of waterways which flow into the Bay of Bengal. The alluvial soil is continuously enriched by heavy silt deposits during rainy season. The total forest area covers about 8% of the land area.

Bangladesh enjoys a sub-tropical monsoon climate. While there are six distinctive climates in a year, three dominate-winter, summer and monsoon. Winter which is cool and dry begins in November and ends in February with temperature running from a minimum of 7 ° C -3 ° C to a maximum of 24 ° C-31 ° C. The maximum temperature recorded in Summer (March-June)

ranges from 36 ° C-41 ° C. The monsoon starts in June and continues to October. The average rainfall varies from 119cm-348cm. The relative humidity is lowest in December (60%) and high in July (99%). Table- 12 shows monthly average of Temperature, Humidity and Rainfall by major station in Bangladesh.

Considering on above mentioned sever natural conditions of Bangladesh, implementation schedule etc. should be planned.

Table-12 Monthly average of Temperature, Humidity and Rainfall by major station in Bangladesh

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Dhaka												
Max.Temp	25.2	27.7	33.1	31.1	32.7	34.5	31.7	32.7	31.5	32.1	30.6	25.0
Mini.Temp	11.5	14.5	21.1	21.1	24.5	25.8	26.4	26.6	25.5	22.1	18.9	18.7
Humidity	70	64	67	74	77	82	86	84	86	77	75	80
Rainfal(mm)	002	007	082	159	151	249	549	230	440	030	010	022
Chittagong												
Max.Temp	26.0	27.4	30.3	30.5	32.5	32.2	31.1	32.5	31.9	32.4	31.3	26.5
Mini.Temp	13.5	15.6	20.8	22.2	25.1	25.4	25.6	26.4	25.3	23.2	20.4	15.1
Humidity	72	74	81	78	81	83	89	85	86	80	78	79
Rainfal(mm)	000	032	118	040	005	507	1038	379	530	100	049	004
Sylhet												
Max.Temp	25.1	25.8	31.4	30.7	32.1	31.0	31.8	32.6	30.0	31.7	29.9	25.6
Mini.Temp	12.1	13.9	19.0	19.5	22.4	23.8	25.4	25.5	23.8	21.7	18.9	14.9
Humidity	74	73	70	74	80	88	89	85	89	80	79	82
Rainfal(mm)	001	027	112	170	347	797	678	492	947	031	023	019
Barisal												
Max.Temp	25.6	26.7	32.4	31.4	33.4	33.2	31.5	31.9	31.7	32.4	30.8	25.1
Mini.Temp	10.7	14.7	21.1	20.7	24.3	25.3	25.5	26.6	24.5	22.0	18.9	13.4
Humidity	79	79	81	84	84	86	90	89	89	84	85	89
Rainfal(mm)	001	030	079	205	235	205	406	191	378	007	011	012
Khulna												
Max.Temp	25.4	28.0	33.0	32.1	34.3	33.7	32.0	32.1	32.6	32.5	31.3	25.4
Mini.Temp	11.0	14.7	20.8	21.4	24.3	25.5	25.8	26.0	25.2	22.6	20.0	13.8
Humidity	75	74	75	76	78	83	87	86	89	79	76	80
Rainfal(mm)	010	022	099	080	181	218	456	321	364	044	002	020
Rajshahi												
Max.Temp	24.0	26.8	32.8	32.4	36.3	34.6	31.8	32.5	30.8	31.4	30.0	23.4
Mini.Temp	9.8	12.1	18.7	20.4	24.4	25.4	25.3	26.4	25.2	22.7	18.6	13.5
Humidity	76	71	66	72	71	82	90	88	89	81	81	86
Rainfal(mm)	8	35	19	55	53	242	765	468	348	4	44	22

3) Concept for Social Conditions

Social conditions of Bangladesh are summarized as follows and considering these conditions Basic Design for the Project should be planned.

Especially, in Bangladesh, 88.3% of the people follow religious practices, and the month of fasting, which is largest event taking place as part of the Islam religion, which is the national religion, will be October – November this year. Based on this, a process is being formulated to make sure that the procurement planning is not affected by the month of fasting. Moreover,

in the three districts of Khagrachari, Rangamati and Bandarban district which are in the hilly region of Chittagong, many of the people belong to minorities, and traffic conditions are deplorable, so that development in the region is slow even for Bangladesh. Because of this, and because of problems such as public order in the region, particularly detailed consultation with the persons involved will be necessary when distributing and installing the equipment and materials in the project sites in these three districts.

(1) Human Resources

The population and its by sex and age group is shown in Table- 14.

Among the least less developing countries (LLDCs), the population of Bangladesh is kept on the top position.

Table-13 Population by sex and age group (Unit:thousand, %)

		Total	0-4year	5-9 year	10-14 year	15-24 year	25-34 year	35-44 year	45-59 year	60year over
1974	Total	71,478	12073 (16.9)	13119 (18.3)	9181 (12.8)	10830 (15.1)	8928 (12.5)	7073 (10.0)	6217 (8.7)	4057 (5.7)
	(Female)	34,407	6058 (17.6)	6519 (18.9)	4194 (12.2)	5260 (15.3)	4539 (13.2)	3294 (9.6)	2778 (8.0)	1765 (5.2)
1981	Total	87,129	14793 (17.0)	14158 (16.3)	11650 (13.4)	14925 (17.1)	11383 (13.1)	8133 (9.3)	7173 (8.2)	4905 (5.6)
	(Female)	42,201	7344 (17.4)	6975 (16.5)	5424 (12.9)	7552 (17.9)	5650 (13.5)	3855 (9.1)	3247 (7.7)	2154 (5.1)
1991	Total	111,455	18695 (16.77)	18391 (16.50)	13443 (12.06)	18864 (16.92)	16269 (14.60)	10883 (9.77)	8865 (7.95)	6045 (5.42)
	(Female)	54,141	9213 (17.02)	8886 (16.41)	6267 (11.58)	9690 (17.90)	8236 (15.21)	4997 (9.76)	4104 (8.52)	2748 (3.68)
1996	Total	122,125	15502 (12.69)	18680 (15.30)	15455 (12.66)	21297 (17.44)	17374 (14.23)	13382 (10.95)	10687 (8.75)	9748 (7.98)
	(Female)	59,411	7921 (12.76)	9733 (15.06)	7839 (12.82)	10781 (17.70)	8629 (14.72)	6924 (10.87)	5625 (8.52)	5262 (7.55)
2001	Total	123,151	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	(Female)	60,415	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A

According to the Census of 1991, the Bengali consists about 98% of the population and some minorities like the Chakuma, the Rakines etc who lives in Chittagong Hill Tracts consist 1.13%.

In the religious, Islam which is national religion consists 88.3%, Hindu consists 10.5% and Buddhist consists 0.6% and Christian consist o.3%. Most of Hindu lives in Khulna and Rajshahi division, west part and near Indian border and Buddhist lives in Chittagong Hill Tracts.

The outline of Education Sector of Bangladesh is shown in Table-14 and Divisional-wise net enrollment ratio and Literacy rate are shown in Table-15.

Table-14 Outline of Education Sector of Bangladesh

	1995	1996	1997	1998
No. of Primary School	78,094	78,595	77,685	66,235
No. of Secondary School	12,553	12,858	N.A	13,419
No. of General College	2,845	3,032	N.A	3,344
No. of Govt Medical College	13	13	13	13
No. of Non Govt Medical College	5	5	5	11
No. of Engineering College	4	4	4	4
No. of Govt University	11	11	11	11
No. of Non Govt University	18	16	16	17
Govt. Expenditure to Education Sector (crore TK)	3,573	3,324	3,848	4,232
Per capit total public Expenditure (TK)	298	272	310	335

Table-15 Divisional-wise net enrollment ratio and Literacy rate in 1997

	National	Rural	Urban	Rajshah	Khulna	Barisal	Dhaka	Sylhet	Chit'ng
Primary school net enrolment ratio (6-10year)	82.0	79.2	95.4	75.1	84.8	88.0	80.7	72.5	81.6
(Male)	84.7	82.5	96.0	78.3	88.4	92.8	81.6	75.0	84.8
(Female)	77.1	73.6	93.0	69.6	78.5	80.5	77.4	67.8	75.3
Literacy rate Over 5y'r	45.1	39.1	57.7	37.3	49.9	54.9	47.2	36.4	45.9
(Male)	48.2	42.4	60.4	41.2	53.7	55.3	50.1	39.0	49.3
(Female)	39.6	33.7	52.0	31.3	43.5	51.8	41.8	31.9	40.1
Literacy rate Over 7y'r	47.3	41.0	59.9	39.3	51.5	56.3	49.5	39.0	48.8
(Male)	50.6	44.5	63.0	42.4	55.3	56.9	52.5	41.8	52.7
(Female)	41.5	35.3	53.7	34.1	44.9	52.9	43.8	34.0	42.4
Literacy rate Over 15y'r	51.0	-	-	47.4	54.9	66.2	48.3	39.3	52.0

(2) Transportation and Communication

The outline of transport and communication sector of Bangladesh are shown in Table-16.

The country is connected by a network of about 4,900 kilometers of railway, about 11,600 kilometers high type paved road and about 5,900 kilometers low type road and waterways but inland transport network is not so well established due to the necessity to cross over many rivers.

There are two international airport, Dhaka and Chittagong, linked with major foreign counyries especially with Singapore and Bangkok by daily flight.

The two seaports are Chittagong and Mongla (Khulna).

Table-16 Outline of Transport and Communication Sector of Bangladesh

	Unit	1993/94	1994/95	1995/96	1996/97	1997/98
Railway Broad gauge	Km	1,528	1,528	1,528	1,528	1,547
Railway Meter gauge	Km	2,836	2,836	2,836	2,836	2,847
Railway No. of Station	Nos	489	489	489	489	477
Railway Goods carried	'000M Tons	2,469	2,729	2,551	2,936	3,038
High type paved road	Km	9,704	9,842	11,663	N.A	N.A
Low type road	Km	5,965	6,228	5,891	N.A	N.A
No. of Truck	'000Nos	33	35	38	39	41
No. of Motor car/ Jeep	'000Nos	48	51	56	61	65
Movement of Goods by Organized Road transportation	'000M Tons	37,359	39,695	42,146	45,269	N.A
Organized Road transportation value added	milTK	17,267	17,760	19,267	20,479	21,935
Movement of Goods by Un-organized Road transportation	'000M Tons	47,032	47,480	48,346	47,211	N.A
Un-organized Road transportation value added	milTK	56,449	60,727	65,677	71,668	76,905
Movement of Goods by Organized Water transportation	'000M Tons	9,561	9,224	10,715	11,072	N.A
Organized Water transportation value added	milTK	5,106	5,219	6,282	5,881	6,254
Movement of Goods by Un-organized Water transportation	'000M Tons	40,925	41,428	42,663	43,936	N.A
Cargo handled at Chittagong port	'000M Tons	7,614	7,918	10,055	10,189	10,498
Cargo handled at Mongla port	'000M Tons	2,379	1,931	2,827	2,839	2,694
No. of Telephone sets	'000Nos	296	315	388	375	464

(3) Economy

The outline of Economic situation and Sectoral shares are shown in Table- 17 and 18.

GDP growth rate of 2000/2001 is 6.04%, altough below the target of 6.5%of 5.4% and recorded top of past five year.

Table-17. Outline of Economic situation of Bangladesh

	1994/95	1995/96	1996/97	1997/98	1998/99
GDP growth rate (%)	4.40	5.35	5.88	5.66	5.21
GDP (Mill TK)	15,251.8	16,632.4	18,070.1	20,017.7	21,969.5
Per capita GDP (TK)	12,720	13,622	14,538	15,824	17,137
Per capita income (TK)	13,108	14,028	15,008	16,337	17,726
Per capita income (US$)	326	343	351	359	369

Table-18 Sectoral Shares of GDP of Bangladesh (Unit:%)

	1995/96	1996/97	1997/98	1998/99	1999/2000
Agriculture,Fishery etc	25.68	25.87	25.34	25.28	25.47
Mining	1.05	1.03	1.03	1.00	1.00
Industry	15.43	15.41	15.88	15.60	15.40
Construction	6.89	7.12	7.39	7.67	7.84
Electricity, Gas etc	1.50	1.46	1.41	1.42	1.43
Transport, Communication etc	9.07	9.10	9.13	9.21	9.24
Trade	12.91	12.94	13.02	13.21	13.38
Housing	9.46	9.31	9.18	9.07	8.91
Finance	1.58	1.58	1.57	1.58	1.58
Public Administration and Defence	2.52	2.52	2.54	2.55	2.56
Others	13.91	13.66	13.51	13.41	13.19
（total）	100.00	100.00	100.00	100.00	100.00

4) Concept for local agents and their capability and reliability

There is a large number of local agents (including import agents) handling medical equipment and supplies in Dhaka, the capital city, and these agents employ personnel who have been trained by the manufacturers, so there are no problems anticipated from a technical standpoint. Also, there are daily flights between Dhaka and Singapore, Bangkok, and other locations, and after-sales services can be provided by local agents in these locations. Therefore, no problems are anticipated with after-sales services of equipment and instruments procured through this project, whether they be Japanese products or third-party products. Consequently, the procurement of the project equipment and instruments from third countries, as well as from Japan and local sources, is being investigated from the standpoint of effective and efficient aid implementation.

5) Concept for the use of local tradesman

The Project Sites are spread throughout 45 of the 60 districts nationwide, and because the project policy is to distribute and transfer the project equipment and materials at each of the recipient facilities, the smooth transportation of the equipment and materials to the recipient facilities, and the installation of the equipment and materials at those facilities, will be key to the successful implementation of the project. Because there are a number of traders in Bangladesh with ample capability of transporting the equipment, no problems are anticipated in terms of finding transportation means, but given the large number of recipient facilities, and the fact that each facility has a different equipment configuration, the utilization of persons responsible for local procurement control and installation is being planned. Also, local laborers will be used for distribution and installation, but because there is some question concerning their technical abilities, and because they must work in close collaboration with the persons responsible for local procurement and installation and complete these tasks in a short period of time, the utilization of distribution and installation supervisors with ample experience in installing medical equipment is being planned.

6) Concept for administrative capability of the executing agencies

Thana Health Complex, Project Site, is managed by Upazila(Thana) Health & Family Planning Officer (UH & FPO) appointed by MOHFW under supervision of District Civil Surgeon.

User' Fee/ Charges of THCs are free of charge in principal and necessary operation / recurrent cost for THCs are financed by MOHFW as per formulated rules (for example, medicines and consumables are supplied from MOHFW through District Store Depot by amount of TK10,000 per 1 bed ,etc).

Each project site has responsibility for maintenance and repair of the medical equipment supported by National Electro-Medical Equipment Maintenance Workshop & Training Center (NEMEW) at Dhaka and District Electro-Medical Equipment Maintenance Workshop (DEMEW) located in 18 districts.

NEMEW has so many experiences for repairing the planned equipment and DEMEW has not so much experience but maintaining necessary staff , and it seems to be better to include NEMEW and DEMEW for this project for maintenance and repair aspects by supplying manual and some spare-parts for planned equipment .

Because it will be necessary to strengthen the maintenance and control systems of the recipient facilities, however, planning has been formulated that takes alliances with the NEMEW&TC and DEMEW mentioned earlier into consideration.

As for necessary human-resources for EOC services, Bangladesh is proceeding training program for Obstetric/Gynecology specialist, Anesthetist, Nurse and Laboratory Technician for this project supported by UNICEF as follows.

	Up to 2000 Trainned and deployed to C-EOC Facilities	2000 to 2001 Training (up to 2001/10)	2001 to 2002 Training (up to 2002/8)	2002 to 2003 Recruting	Total
Obstetric/ Gynecology	45	16	24	N.A	85
Anaesthesist	47	16	11	N.A	74
Nurse	107	40	N.A	N.A	187
Laboratory Technician	35	30	N.A	N.A	65

7) Concept for the setting of grade for facilities and equipment

The basic concept concerning the project equipment and materials have been selected and planning formulated with reference to the status of the pertinent recipient facility, such as its function, role, and the current status of its equipment and supplies, as well as the operating and maintenance control capability of the facility and supplies and materials being provided by other donors such as UNICEF.

① Priority will be given to the upgrading and replacement of existing equipment that is aged and deteriorating, and to the replenishment of insufficient equipment and materials.

② New equipment and materials to be procured (such as anesthesia equipment, etc.) will be specified following thorough investigation of the necessity and appropriateness of such equipment, based on factors such as personnel assignments and other circumstances.

③ Rather than having the recipient facilities procure all of the project equipment and materials, plans and specifications will define equipment and materials for each individual recipient facility, separately.

8) Concept for publicity and procurement methods, and the term of the work

Equipment and materials procurement contractors will be selected by means of bidding, and lump sum contracts will be awarded that include all aspects from the procurement of the equipment and supplies to the recipient facilities to the transportation and delivery to the facilities, installation, trial operation, and technical guidance involving maintenance control. Also, considering the large number of recipient facilities, as well as the natural conditions, social conditions, and other aspects described earlier, a margin of extra time will be built into the period allowed for the work, in view of shortages and other potential situations.

2-2-2 Basic Plan

1) Overall planning

Based on the discussions with Bangladesh for planned project site and equipment etc, a Study team has conducted a survey to grasp present conditions, medical services and existing equipment of the project site by visiting project sites and collecting replies for questionnaire. Some off-limits areas could not be visited due to bad conditions of access roads, however, the mission visited 48 planned C-EOC sites and over 30 B-EOC sites.

Interviews to the sites for manpower allocation, conditions of medical equipment, supporting facilities, and investigation for the essential infrastructure such as water supply, drainage, electricity, and communication system were made. Not only from interviews but also documents collected by the District Civil Surgeon, general information were obtained including roles of the project site, staff allocation, size of the beneficiary, and accessibility to the site.

After conducted field survey of proposed C-EOC sites, three proposed C-EOC sites , Ruma THC of Bandarban District , Sandwip THC of Chittagong District and Monpura THC of Bhola District, should be changed to B-EOC site due to their present conditions and situations are not enough for providing C-EOC services at these three sites.

Considering for the positions and functions of each project sites in the health care system in Bangladesh which shown in Table-20, Thana Health Complexes at 239 locations in 45 districts in Bangladesh (facilities at which C-EOC services are provided in 47 locations and facilities at which B-EOC services are provided at 192 locations), as well as medical equipment repair centers (at a total of 19 locations: the National Center located in Dhaka and district centers located in 18 districts) are targeted for cooperation, which will be implemented in two phases (Phases I and II).

(1) At C-EOC facilities, Phase I will target 27 facilities at which obstetricians and anesthesiologists have already been assigned, or who are currently undergoing training and whose assignments have already been decided. Phase II will target 20 facilities at which obstetricians and anesthesiologists commencing their training subsequent to this March will be assigned. (However, of the Phase I C-EOC facilities at 27 locations, because obstetricians have already been assigned but anesthesiologists are still undergoing training at ten of the facilities, anesthesia equipment and pulse oxymeters will be excluded from the equipment to be procured in Phase I. This equipment will be procured during Phase II, after the anesthesiologists have completed their training, and will be installed at the ten locations described above. These ten locations are indicated with an asterisk in Table 21 below, “Divisional-wise, District-wise Planned Sites ”.)

(2) As a rule, taking costs such as transportation and delivery costs into consideration, Phase I will target B-EOC facilities in the same districts in which the C-EOC facilities are located for which all of the equipment and materials, including anesthesia equipment and pulse oxymeters, has been procured, and the remaining B-EOC facilities will be targeted in Phase II.

Because facilities targeted by Phase I must be covered by, tools and other equipment will be procured for medical equipment repair centers (NEMEW and DEMEW) during Phase I.

Table-20 Health care system in Bangladesh

Tertiary Referral Level	Central	Teaching Hospital / Institute	250-1,050 Beds
	Division	(Medical College Hospita 13)	
	District	(Teaching Institute/Post Graduate Hospital 5)	
		(Specialized Hospital 23)	
Secondary Referral Level	District	District Hospital 59	50-150 Beds
		MCWC 61	
Primary Referral Level	Thana	Thana Health ComplexTHC） x 400	31 Beds
		MCWC	
Primary Level Health Facility	Union	Health and Family Welfare Center	
	Community	Community Clinic	
	Ward & Village Level	Health Assistant(HA)	
		Family Welfare Assistant(FWA)-all Female	
		They are all civil Servants and provide door-step health and family planning services to each household, visit every 4-8week.	
		Under their guidance, there are some volunteers or independent health workers such as Village Health Volunteers(VHV) and trained birth attendants(TBA) providing limited health servicies at the village level.	
		Almost all the VHVs and TBAs have received limited training under Government programmes.	

2) Project Site and planned site for C-EOC and B-EOC

After conducted field survey of planned C-EOC sites, it is found that necessary human resources for providing C-EOC services like Obstetric/Gynecology specialist and Anesthetist are secured for 21 sites of 20 districts, they are already deployed and/or received 1 year training at medical college hospital, but remaining sites are not yet secured necessary human-resources.

Accordingly, basic design should be planned by phasing, and decide that 1st term consist of 27 C-EOC sites and 64 B-EOC sites of 24 district, and 2nd term consist of 20 C-EOC sites and 128 B-EOC sites of 21 district.

District-wise phasing and List of project site for Term I and Term II are shown in Table-21 and Table-22.

Table-21 Divisional-wise, District-wise Planned Sites

Division	District	Phasing	Planned C-EOC Site		Planned B-EOC Sites		Ref. for C-EOC Site etc
			Number	Name of Site	Number	Name of Sites	
Rajshahi	Panchagarh	I	1	Tetulia★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		II	(1)	(Tetulia)	3	Atwari, Boda, Debiganji,	For Tetulia, only Anesthesia machine and Pulse Oxymeter
	Lalmonnirhat	I	1	Kaliganj	2	Hatibandha, Aditmari	
	Kurigam	I	2	Roumari, Nageswari	6	Rajarhat, Fulbari, Ulipur, Bhurungamari, Chilmari, Rajibpur	
	Sirajganj	I	2	Chowwhali, Taras★,	0	—	For Chowwhali, all equipment For Taras, Equipment excluding Anesthesia machine and Pulse Oxymeter
		II	(1)	(Taras)	4	Ullapara, Belkuchi, Raigonj, Kamarkhand	For Taras, only Anesthesia machine and Pulse Oxymeter
	Bogra	I	1	Sariakandi	8	Adamdighi, Dupchachia Kahaloo, Sherpur, Gabtali, Shibgonj, Nandigram, Dhunut	
	C.Nawabganj	I	1	Shibgonj	2	Gomastapur, Bholahat	
	Thakurgaon	II	1	Baliadanga	2	Ranishankail, Pirgonj	
	Dinajipur	II	1	Birgonj	9	Bochagonj, Birol, Khansama, Chirirbandar, Parbatipur, Nawabgonj, Hakimpur, Kaharol, Fulbari,	
	Naogaon	II	1	Patonitala	8	Manda, Mohadebpur, Badalgachhi, Sapahar, Dhamurhat, Porsha, Atrai, Raninagar	
	Natore	II	1	Larpur	3	Bagatipara, Singra Baraigram	
	Gaibandha	II	0	—	4	Shaghata, Sadullapur, Polashbari, Fulchari	No C-EOC Site in this District
	Pabna	II	0	—	6	Sathia, Bera, Sujanagar, Faridpur, Chatmohar, Atghania	No C-EOC Site in this District

Division	District	Phasing	Planned C-EOC Site		Planned B-EOC Sites		Ref. for C-EOC Site etc
			Number	Name of Site	Number	Name of Sites	
Khulna	Jhenaidha	Ⅰ	1	Harinakunda	3	Moheshpur, Kotchadpur, Kaligonj	
	Magura	Ⅰ	1	Shalikah★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1)	(Shalikah)	1	Shreepur	For Shalikah, only Anesthesia machine and Pulse Oxymeter
	Jessore	Ⅰ	1	Jhikargacha	4	Bagerpare, Sharsha, Monirampur, Keshbpur	
	Satkhira	Ⅰ	1	Kalaros	4	Debhatta, Kaligonj, Tala, Ashashuni,	
	Kushtia	Ⅱ	1	Daulatpur	3	Kumarkhali, Khoksha, Mirpur	
	Chuadanga	Ⅱ	1	Alamdanga	1	Damurhuda	
	Khulna	Ⅱ	1	Koyra	6	Paikgachha, Batiaghata, Fultola, Rupsha, Daulatpur, Terokhada	
Barisal	Patukhali	Ⅰ	1	Bauphal★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1)	(Bauphal)	3	Mirzagonj, Dashmina, Galachipa	For Bauphal, only Anesthesia machine and Pulse Oxymeter
	Perojpur	Ⅱ	1	Mothbaria	3	Bhandaria, Kaowkhali, Swarupkathi (Nesarabad)	
	Barguna	Ⅱ	1	Betagi	2	Bamna, Amtali	
	Bhola	Ⅱ	1→0	—	4→5	Lalmohan, Tajumuddin, Borhanuddin, Monpura Daulatkhan	Monpura is changed from C-EOC to B-EOC
Dhaka	Madaripur	Ⅰ	1	Shibchar★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1)	(Shibchar)	2	Rajoir, Kalkini	For Shibchar, only Anesthesia machine and Pulse Oxymeter
	Gopalganj	Ⅰ	1	Tungipara★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1)	(Tungipara)	2	Kashiani, Mokshedpur	For Tungipara, only Anesthesia machine and Pulse Oxymeter
	Narshungdi	Ⅰ	1	Monohordi	4	Raipur, Shibpur, Polash, Belabo	
	Gazipur	Ⅰ	1	Kaligonj	2	Kapashia, Shreepur	

Division	District	Phasing	Planned C-EOC Site		Planned B-EOC Sites		Ref. for C-EOC Site etc
			Number	Name of Site	Number	Name of Sites	
	Sherpur	Ⅰ	1	Jhenaigati★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1)	(Jhenaigati)	3	Sreebadi, Nalitabari, Nakla,	For Jhenaigati, only Anesthesia machine and Pulse Oxymeter
	Mymensingh	Ⅰ	1	Nandail	8	Dhohaura, Fhulpur, Gauripur, Ishwargonj, Muktagachha, Fulbaria Gafargaon, Trishal	
	Kishoregonj	Ⅰ	2	Bhairab★ Karimgonj	0	—	For Bhairab, Equipment excluding Anesthesia machine and Pulse Oxymeter For Karimganj, all equipment
		Ⅱ	(1)	(Bhairab)	8	Hossainpur, Pakundia, Katiadi, Kuliarchar Bajitpur, Austagram Tarail, Itna	For Bhairab, only Anesthesia machine and Pulse Oxymeter
	Shariatpur	Ⅱ	2	Goshairhat, Zazira	2	Damuddya, Naria	
	Tangail	Ⅱ	1	Nagarpur	5	Mizapur, Delduar, Bashail, Kalihati, Ghatail	
	Jamalpur	Ⅱ	1	Sharishabari	4	Mathargonj, Melandaha, Islampur, Bakshigonj	
	Netrokona	Ⅱ	1	Kendua	7	Khaliajhuri, Madan, Atpara, Mohangonj, Barhatta, Purbadhala, Durgapur	
Sylhet	Hobigonj	Ⅱ	1	Chunarghat	5	Bahubal, Madhapur, Nabigonj, Baniachong Lakhai	
Chittgong	Braman Baria	Ⅰ	2	Sarail, Bancharampur★	0	—	For Sarail, all equipment For Bancharampur, Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1) 1	(Bancharampur) Nasinagar	3	Akaura, Kashba, Nabinagar	For Bancharampur, only Anesthesia machine and Pulse Oxymeter
	Chandpur	Ⅰ	1	Faridganj★	0	—	Equipment excluding Anesthesia machine and Pulse Oxymeter
		Ⅱ	(1)	(Faridganj)	3	Hazigonj, Kachua, Haimchar	For Faridganj, only Anesthesia machine and Pulse Oxymeter

Division	District	Phasing	Planned C-EOC Site		Planned B-EOC Sites		Ref. for C-EOC Site etc
			Number	Name of Site	Number	Name of Sites	
	Laxmipur	Ⅰ	1	Ramganj	1	Raipur	
	Khagrachari	Ⅰ	1	Panchari	6	Manikchari, Ramgarh, Matiranga, Laxmichari Mohalchari, Dighinala	
	Rangamati	Ⅰ	1	Rajsthali	8	Bagaichari, Langadu, Naniarchari, Kawkhali, Barkol, Jhuraichari Belaichari, Kaptai	
	Bandarban	Ⅰ	1→0	—	5→6	Rowangchari, Thanchi, Alikadam, Naikongchari Lama, Ruma	Ruma is changed from C-EOC toB-EOC
	Noakhali	Ⅱ	2	Hatiya Companiganj	3	Chatkhil, Begumganj, Senbag	
	Feni	Ⅱ	1	Parsuram	3	Sonagazi, Daganbhuiyan, Chagalnayan	
	Chittagong	Ⅱ	0	—	10	Rangunia, Rawzan, Hathazari, Sitakunda, Boalkhali, Patiya, Chandainish, Anowara Satkania, Sandwip	Sandwip is changed from C-EOC to B-EOC
	Cox's Bazar	Ⅱ	1	Teknaf	5	Chakaria, Kutubdia, Moheshlhali, Ramu, Ukhiya	
（Total）	(45)		50→47		189→192		

Table-22　Number of District-wise Planned Site by phasing

	Number of District	Number of C-EOC Sites	Number of B-EOC Sites	Total
Term I	24	27	64	91
Term II	21	20	128	148
Total	45	47	192	239

（Note）10 C-EOC Sites where marked ★ in Table-21 such as Tetulia in Panchagar District are supplied equipment excluding Anesthesia machine and Pulse Oxymeter at Term I and these 2 equipment will be supplied at Term II. Count these 10 Sites as Term I planned Site.

Table-23 Location of Medical Equipment Maintenance Workshop where maintenance tools etc are supplied at Term I

Name of Medical Equipment Maintenance Workshop	Location (District)
National Electro-Medical Equipment Maintenance Workshop & Training Center（NEMEW & TC）	Dhaka
District Electro-Medical Equipment Maintenance Workshop （DEMEW）	Bogra, Rangpur, Dinajipur,Rajshahi, Pabna Barisal, Patukhali, Kushtia, Jessore, Mymensingh, Faridpur, Tangail, Jamalpur, Sylhet, Comila, Noakhali, Rangamati, Bandarban

3) Equipment / Instruments Planning

In accordance with the design concepts for the selecting equipment as discussed in 2-1, essential Equipment/Instruments for C-EOC and B-EOC are examined and planned based on the results of field survey.

(1) General conditions of each project site

① Buildings

The buildings are two stories of bricks and RC made which constructed at the East Pakistan era as Rural Health Center. They are old but can be used for.

② Electricity

Electricity is supplied from PDB, and most of C-EOC sites have connection to electricity. However, blackout happens frequently and voltage fluctuates are commonly found.
Some B-EOC sites has no electricity supply.

③ Water Supply

In most sites, water is supplied from wells or water storage tank, and in a few sites there is direct supply of water from water supply tank through pipeline. The quality check shows it is hard water, but it does not have any problems and no arsenic contaminations.

④ Communication System

Almost all sites have telephone connections except some sites whose telephone connections were unstable and unreliable for emergency use.

⑤ Medical waste disposal

Medical waste is buried under the ground in the specific area after destroy by fire by Thana administration.

⑥ Gas supply

Almost all sites, have no supply of natural gas pipelining and gas is supplied from the cylinder.
Medical gas are also supply from the cylinder and no central piping system.

(2) Equipment for planned/included

C-EOC	B-EOC	Name of Equipment	New Substtute	Examinations etc
C-1		Anaesthesia Machine with O2 & N2O Cylinder	New	Equipment for general anaesthesia using at major operations like laparotomy and caesarean section It is necessary to manage operation cost and maintenance cost (abt US$100/year) At most cases , doctors are using spinal anaesthesia procedures (local anaesthesia) for caesarean section operation and in very rare cases they are using anaesthesia machine. Bangladesh side informed that they can easily get consumables and other necessary items and its maintenance cost is not so high and they can manage necessary fund. Bangladesh side insisted that this machine is mandatory for C-EOC services and they has a national plan to supply to all C-EOC facilities, as witout this no surgeon feels comfortable and confident in using spinal anaesthesia. And also informed that the Govt. has a plan of expanding the services of THCs by convering 31 beds to 50 bed hospitals and when use of this will further widened. Necessary human resource development are planning and proceeding (1 year training). UNICEF and UNFPA are suppling this machine for EOC project. Considering these ciecumstances , it is better to include.
C-2	B-2	Labour Table	Substitute	Essential equipment for obstetric service. Existing equipments are almost all old and deterioated.
C-3		Laryngoscope	New	Essential equipment to secure trachea at the emergency.
C-4		OT Table	Substiute	Essential equipment for operation room. Existing equipments are almost all old and deterioated.
C-5		OT Light with Battery	Substitute	Same as above
C-6		Autoclave	Substitue	Eseential equipment for sterlising materials and goods using for operation. Existing equipments are almost all old and deterioated.
C-7		Sterilising Drum S,M,L	Substiute	Equipment necessary for Autoclave.
C-8	B-5	Instrument Sterilizer	Substiute	Essential equipment for sterlising small materials for operation etc. Existing equipments are almost all old and deterioated.
C-9	B-6	Electric Suction pump 1Lit,	Substiute	Essential equipment for operation and delivery Existing equipments are almost all old and deterioated.
C-10	B-7	Ambu Bag	New Substitute	Essential equipment for revive pregnant and baby at the emergency. Existing equipments are almost all old and deterioated.
C-11	B-8	Cylinders (with Oxygen Therapy Unit)	New Substitute	Essential equipment for oxygen supply at the energency. Existing equipments are almost all old and deterioated.
C-12	B-9	Baby Weighing Scale	Substiute	Necessary equipment for measuring weight of new borne. Existing equipments are almost all old and deterioated.
C-13	B-10	Episiotomy Set	New Substitute	Essential material set for delivery. Only few items are held and lack of numbers.
C-14		Laparotomy Set including Caesarian Section Set	New	Essential material set for caesarean section.
C-15	B-11	Neonatal Resuscitator/Laryngoscope	New	Essential equipment for obstetric service

C-EOC	B-EOC	Name of Equipment	New Substtute	Examinations etc
C-16	B-12	Uterine Evacution Set	New Substitute	Essential materials set for obstetric service. Only few items are held and lack of numbers
C-18	B-13	Instrument Trolly	Substiute	Equipment using for keeping necessary materials and goods for treatment, operation and delivery. Existing equipments are almost all old and deterioated.
C-20	B-15	Instrument Tray	Substiute	Essential equipment for keeping materials and goods for treatment. Existing equipments are almost all old and deterioated.
C-21	B-16	Revolving Stool	Substiute	Essential equipment for diagnosis. Existing equipments are almost all old and deterioated.
C-22	B-17	Stand (Bowl)	Substiute	Essential equipment for diagnosis and treatment. Existing equipments are almost all old, deterioated and lack of numbers.
C-23	B-18	Basin (S/S Bowl)	Substiute	Same as above. Using with above.
C-24-1		Centrifuge Machine,Table Top	Substiute	Essential equipment for laboratory for using general examination of blood. Existing equipments are almost all old and deterioated.
C-24-3		Binocular Microscope	Substiute	Essential equipment for laboratory.
C-24-4		Blood Cell Counter,Manual type	New	Essential equipment for laboratory for counting blood cell.
C-25	B-19	Stabilizer	New	Essential equipment for electric equipment using at voltage fluctuated facilities.
C-26	B-20	Examination Light	Substiute	Essential equipment for diagnosis. Existing equipments are almost all old and deterioated.
C-27		Vacuum Extractor	New	Essential equipment for vacuum extracting delivery.
C-28	B-22	Patient Examination Table	Substiute	Essential equipment for diagnosis etc. Existing equipments are almost all old,,deterioated and lack of numbers.
C-29	B-23	Stretcher with Trolly	Substiute	Essential equipment for patients difficult to walk. Existing equipments are almost all old and deterioated.
C-31	B-25	Mercury Sphygmomanometer, Stand type	Substiute	Essential equipment for diagnosis. Existing equipments are almost all old and deterioated.
C-32	B-26	Stethoscope	Substiute	Same as above.
C-33	B-27	Fetal Stethoscope	New Substitute	Essential equipment to confirm heart beat of fetus.
C-34		Air Conditioner	New	Not so much necessary for diagnosis and treatment,and using at only operation room UNICEF and UNFPA are supplying this and Bangladesh are strongly requested to include. Considering wether conditions and other donors policy etc, It is included.
C-35		Generator, max. 6KVA	New Substitute	Essential equipment for emergency loadshedding.
C-37		Pulse Oxymeter	New	Essential equipment for operation using anaesthesia.
C-39		Exhaust Fan	New	Necessary equipment for storing drugs, goods and equipment etc.
C-40	B-29	Partitions (3 Pannels)	New Substitute	Necessary equipment for hindering patients from others.
C-41	B-30	Height and Weighing Scale	Substiute	Essential equipment for diagnosis. Existing equipments are almost all old and deterioated.
C-42	B-31	Portable Weighing Machine	Substiute	Same as above.
C-43		Infant Warmer	New	Necessary equipment for maintaing body temparature of newborne.

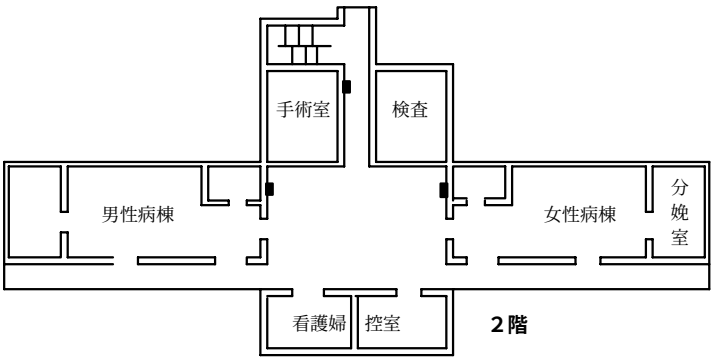
And based on the field survey and collecting the replies for the questionnaire from each project site, planned equipment for each project sites are decided and summed up as follows.

		Name of Equipment	Pl'nd Unit	Term I C-EOC Site Nos.	Term I B-EOC Site Nos.	Total Term I	Term II C-EOC Site Nos.	Term II B-EOC Site Nos.	Total Term II	Grand Total	Ref.
C-1		Anesthesia Machine with O2 & N2O Cylinder	1	17	0	17	30	0	30	47	
C-2	B-1	Labour Table	1	23	59	82	18	107	125	207	
C-3	B-2	Laryngoscope	1	26	58	84	19	104	123	207	
C-4		OT Table	1	24	0	24	18	0	18	42	
C-5		OT Light	1	25	0	25	18	0	18	43	
C-6		Autoclave, electric	1	27	0	27	20	0	20	47	
C-7		Sterilizing Drum	1	27	0	27	20	0	20	47	1 unit=4 pcs
C-8	B-5(a)	Instrument Sterilizer (Electric)	1	24	51	75	20	124	144	219	
	B-5(b)	Instrument Sterilizer (Kerosene)	1	0	5	5	0	4	4	9	
C-9	B-6(a)	Electric Suction pump set	1	27	0	27	20	0	20	47	1 Large and 1small
	B-6(a)	Electric Suction pump	1	0	48	48	0	102	102	150	1 Large
	B-6(b)	Foot pedal Suction pump	1	0	5	5	0	4	4	9	
C-10	B-7	Manual Resuscitator	1	23	44	67	18	84	102	169	
C-11	B-8	Cylinders (with Oxygen Therapy Unit)	1	20	44	64	19	70	89	153	
C-12	B-9	Baby Weighing Scale	1	26	55	81	18	102	120	201	
C-13		Episiotomy Set	2	27	0	27	20	0	20	47	
	B-10	Episiotomy Set	1	0	64	64	0	128	128	192	
C-14		Laparotomy Set including C/S Set	2	27	0	27	20	0	20	47	
C-15	B-11	Neonatal Resuscitator/ Laryngoscope	1	27	59	86	20	106	126	212	
C-16	B-12	Uterine Evacuation Set	1	27	59	86	20	106	126	212	
C-18	B-13	Instrument Trolly	1	25	53	78	17	99	116	194	
C-20	B-15	Instrument Tray Set	1	25	54	79	20	94	114	193	1 unit=3 pcs (L,M,S)
C-21	B-16	Revolving Stool	1	27	59	86	20	105	125	211	1 unit=3 pcs
C-22	B-17	Stand (Bowl)	1	27	59	86	20	105	125	211	
C-23	B-18	Basin (S/S Bowl)	1	27	59	86	20	105	125	211	1 unit=2 pcs
C-24-1		Centrifuge Machine, Table Top	1	27	0	27	19	0	19	46	
C-24-3		Binocular Microscope	1	14	0	14	12	0	12	26	
C-24-4		Blood Cell Counter	1	27	0	27	20	0	20	47	

		Name of Equipment	Pl'nd Unit	Term I C-EOC Site Nos.	Term I B-EOC Site Nos.	Total Term I	Term II C-EOC Site Nos.	Term II B-EOC Site Nos.	Total Term II	Grand Total	Ref.
C-25	B-19	Stabilizer	1	27	54	81	20	102	122	203	For C-EOC 1 unit=3 pcs For B-EOC 1 unit=1 pc
C-26	B-20	Examination Light	1	27	50	77	18	100	118	195	
C-27		Vacuum Extractor	1	27	0	27	20	0	20	47	
C-28	B-22	Patient Examination Table	1	25	51	76	19	89	108	184	1 unit=2 pcs
C-29	B-23	Stretcher with Trolly	1	27	57	84	20	102	122	206	
C-31	B-25	Mercury Sphygmomanometer, S tand type	1	24	59	83	19	101	120	203	
C-32	B-26	Stethoscope	1	24	50	74	17	86	103	177	1 unit=5 pcs
C-33	B-27	Fetal Stethoscope	1	27	55	82	18	102	120	202	
C-34		Air Conditioner	1	26	0	26	20	0	20	46	
C-35		Generator	1	20	0	20	12	0	12	32	
C-37		Pulse Oxymeter	1	17	0	17	30	0	30	47	
C-39		Exhaust Fan	2	25	0	25	19	0	19	44	
C-40	B-29	Partition (3 Pannels)	1	27	59	86	20	104	124	210	1 unit=3 pcs
C-41	B-30	Height and Weighing Scale	1	27	59	86	19	103	122	208	
C-42	B-31	Portable Weighing Machine	1	27	55	82	19	97	116	198	1 unit=2 pcs
C-43		Infant Warmer	1	27	0	27	20	0	20	47	
ADD-1		Tool for NEMEW/ DEMEW	1			19			0	19	

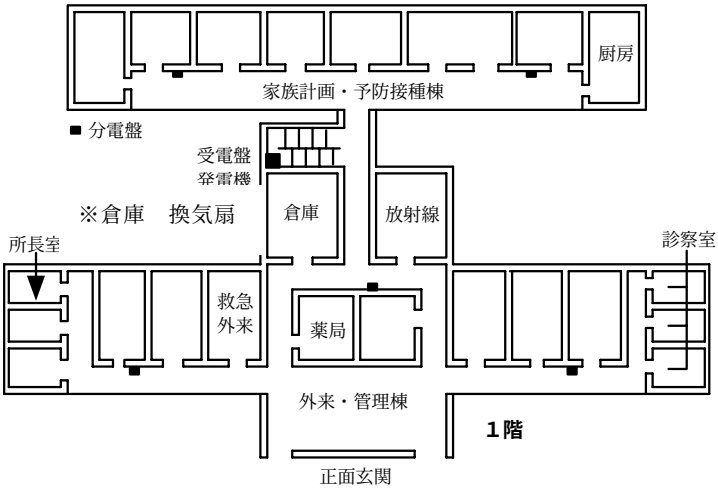
2-2-3 Basic Design Drawing

Facility Components of Thana Health Complex and Proposed Place where Equipment installed are as follws.



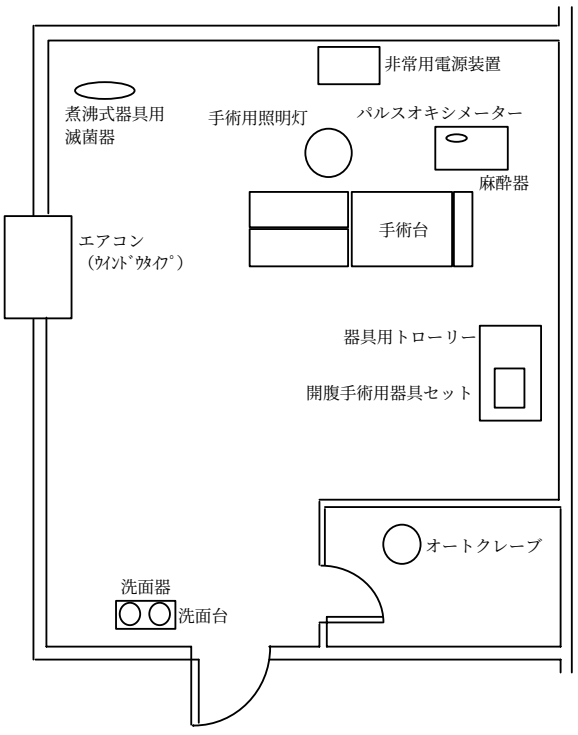
1 st Fl Laboratory
Centrifuge (Table-top), Binoculars Microscope, Blood Cell Counter.

1 st Fl Labors Room
Labour Table, Vacuum Extractor, Examination Light, Infant Warmer, Exhaust Fan.



Examination and Emergency Room.
Height and Weighing Scale, Partition.
Examination Table, Stethoscope.

Operation Room



1 st. El. Operation Room.
Anesthesia Machine, OT Table, OT Light, Suction Pump,Air Conditioner, Pulse Oxymeter, Laparotomy Set,Uterine Evacuation Set. Autoclave

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

This Project shall be implemented strictly in accordance with the Japanese Grant-in-aid principle. After signing Exchange of Notes (E/N), Japanese Consultant will act on behalf of the Government of Bangladesh based on the consultant agreement between the Government of Bangladesh and the Consultant to;

(1) select and finalize the specifications of the Equipment

(2) select and determine the Supplier (Japanese Enterprise) who will procure the Equipment and necessary services therewith upon evaluation thereof.

(3) inspect the quality of equipment strictly in accordance with the technical specifications and the relevant tender requirements to give approval to the Supplier on behalf of the Government of Bangladesh.

(4) supervise shipment and in-land transportation.

(5) supervise commissioning of the Equipment which includes initial operational training to the end users

(6) furthermore, until the fulfillment of the warranty, careful supervision shall be done by the Consultant and when some default will be found, such remedy shall be done immediately by the Supplier upon the direction and supervision of the Consultant

The equipment for the Project will be procured from Japan, Bangladesh and third countries. Necessary consumables and spareparts to be required with the equipment will be included for the quantity that will be necessary for the period in accordance with the estimation made by the Consultant for each equipment. The equipment which requires installation and commissioning shall be made by the Supplier as his works under the Project. Pre-shipment inspection shall be made by the Consultant by employing neutral inspection agencies. Necessary labors required for the installation works will be prepared by the Supplier.

Intimate discussions will be made at the detailed designing stage and thereafter between the representatives of the Supplier and the project officers of the Government of Bangladesh as to the Equipment transportation, installation, initial operation and commissioning will be made until the final acceptance of the Project Equipment.

To lead the discussions to be successful, following will be required.

(1) Bangladesh is located in the subtropical monsoon area and some difficulties are anticipated for transportation, storage and opening the packages during monsoon season.. Also special care will be needed to prevent from thievery during the storage from opening package to the final delivery. Therefore, both parties should have mutual consultation well in advance about delivery, storage and installation procedures

(2) Some Equipment will need modification work of the existing facility (they are partition, foundation, switch board, outlet fixing etc.). Detailed drawings will be prepared to fix the scope of work between the parties in order to avoid unnecessary troubles from such modification work.

(3) Reasonable period of time will be assigned to secure successful technical transfer from the manufacturers to the relevant personnel including medical officers and paramedical personnel of the project site. Time schedule of such transfer will be prepared by mutual consultation between the parties well in advance.

(4) Safety precaution should be made as to the installation and operation of the specific Equipment. Sufficient care should be taken to minimize trouble and accident with enough preparation and discussions.

(5) Sufficient quantity of electricity supply, water supply, enough care to sanitary system and pollution to the community and safety precaution would be secured.
These considerations are inevitably required for the successful operation of the Equipment as appropriate.

(6) The consultant will supervise the Supplier if they will fulfill all the duties and obligations specified in the Supply Contract until the completion of the Project. The Consultant will make the Supplier to submit necessary reports to the Government of Bangladesh from time to time in due course of the procedure.

The Project shall be implemented on the following responsibility of each party concerned.

(1) Project Executing Institution
The Government of Bangladesh is responsible to direct the project in Bangladesh and The Director of Primary Health Care & Communicable Disease Control, ESP, DGHS will be acting as the executing agency.
Director of Primary Health Care & Communicable Disease Control, ESP, DGHS is responsible for the Project as the project management and he will select and appoint relevant experts to implement the project.
And Upazila Health & Family Planning Officer, chief executive officer of the project site, should cooperate for the project implementation.

The Supplier is further responsible for proper operation and maintenance of the equipment even after the acceptance of the equipment.
During the mechanical warranty period, the Supplier will replace any and all the defaults with new one at the cost of the Supplier. Bangladesh party shall be cooperative to carry out such remedy and modification work smoothly.

The relevant experts are totally responsible for the following scope of work during the period from storage, package opening, installation and commissioning until final acceptance.

① Set up the project implementation team who can ensure smooth technical transfer at commissioning stage.

② Select and appoint qualified technical experts to attend/supervise the initial operational training and trouble shooting of the Equipment.

③ Select and appoint qualified engineers who are responsible for electricity and water supply and drainage of facility.

(2) Consultant

Consultant will execute Consultant Agreement with the Government of Bangladesh within reasonable period of time after signing E/N between the governments concerned. This agreement extensively covers from detailed designing, project supervision to the completion of the Project. This agreement becomes valid upon verification of the Japanese Government.

Consultant is responsible for the following services at each stage of the Project:

① To prepare and finalize tender documents for the procurement of the Equipment

② To evaluate the tenders and recommend the Supplier

③ To supervise the procurement procedures and make inspection as well as managing initial operational training after installation to be made by the Supplier

④ To maker preparation of the technical documents to implement the Project which includes the Equipment layout drawings as appropriate and its approval

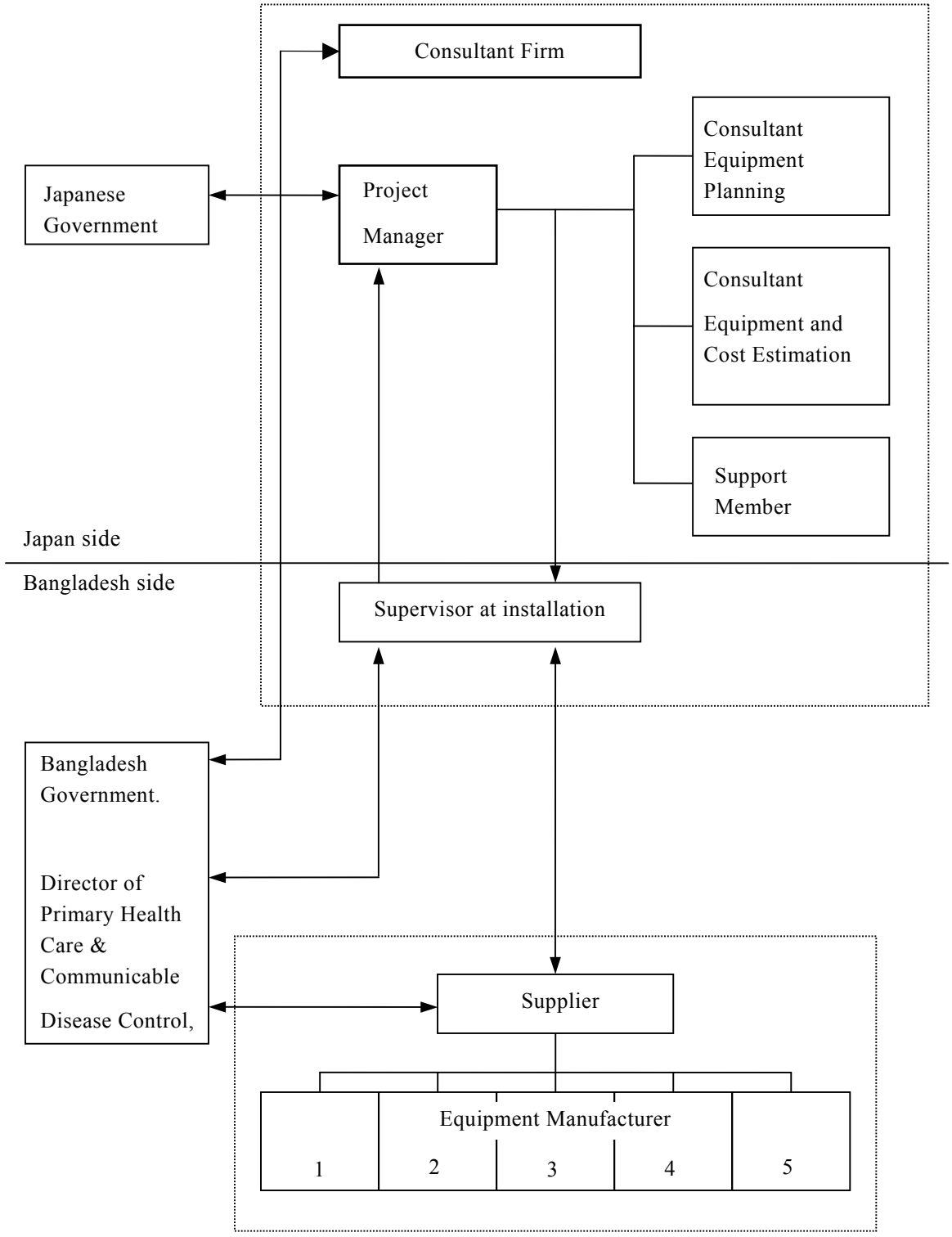
(3) Procurement of the Equipment

The Supplier will be selected to procure Equipment by the competitive tender, and the Supply Contract will be signed between the Government of Bangladesh and the Supplier. This Contract will become valid upon the verification of the Japanese Government.

The Supplier is responsible to procure Equipment and make smooth delivery thereof to the project sites after installation and commissioning if required for which the Consultant will supervise every services performed by the Supplier to the satisfaction of the Government of Bangladesh under the Contract.

The Project implementation organization chart is shown as follows.

Project implementation organization chart



2-2-4-2 Implementation Conditions

Currently it is observed as follows:

1) Electricity supply conditions
   Voltage is fluctuating in some way and unexpected power failure takes place occasionally.
2) The project sites are 239 and located 45 districts out of 64 districts and distributed whole Bangladesh. Considering the bad road conditions and the severe natural conditions, it is necessary to implement the project cautiously.

2-2-4-3 Scope of Works

Scope of work of each party concerned is confirmed as follows:

1) Scope of Work by Bangladesh Side
   * To secure enough space for large scale Equipment to be installed and to remove existing facility and equipment if necessary.
   * To secure enough space for storage of the Equipment to be procured.
   * To bear cost not attributable to the Japanese grant aid budget.

2) Scope of Work by the Japanese Side
   * To procure the Equipment under the Project.
   * To transport the Equipment to the project sites.
   * To install with its commissioning thereafter.
   * To give orientation of the operational and maintenance training of the Equipment.

2-2-4-4 Consultant Supervision

Consultant Agreement will be executed by and between the Executing Organization and the Japanese Consulting Firm strictly in accordance with the current grant-in-aid scheme.

The Consultant is neutrally responsible to conduct detailed designing, and execution of the Project supervision. The Consultant will supervise every acts taken by the Supplier during the Project implementation whether they are made in accordance with the requirements under the tender documents.

The details of the services are specified as follows:

1) Tendering followed by the Supply Contract
   All the tender documents will be prepared and delivered to all the eligible tenderers. These

documents become effective upon approval by the Government of Bangladesh.

All the tender procedures will be managed and organized by the Consultant and all the tenders are carefully and extensively evaluated by the Consultant together with the Government of Bangladesh.

Government of Bangladesh and the Supplier will execute the Supply Contract for the fulfillment of the services for the Project.

2) Advice, instruction and adjustment to be given to the Supplier.
Examine the procurement and installation schedule which prepared by the Supplier and the Consultant will give advice, instruction and adjustment on behalf of the Government of Bangladesh.

3) Confirmation and check in conformity with tender documents.
The Consultant is solely responsible to check the quality and workmanship of the Equipment whether they are procured strictly in accordance with the tender documents.

4) Pre-shipment Inspection
Pre-shipment inspection will be done by the Consultant using inspection agency to confirm whether the equipment are procured in accordance with the specifications and give approval on behalf of the Government of Bangladesh before its shipment.

5) Prepare and submit periodic Report to the Government of Bangladesh and JICA.
Consultant is responsible to wake periodic report to the Government of Bangladesh and JICA in connection with the procurement/shipment as well as the installation progress.

6) Test Run and Final Acceptance
When all the Equipment are properly installed and/or handed over, the Consultant will give order to the Supplier to implement test run and necessary commissioning services for the equipment so required until final acceptance by the Government of Banglades. The Consultant will prepare the necessary report and make them known to all the people concerned for the issuance of the Completion Certificate.

2-2-4-5 Procurement Plan

Majority of the Equipment will be procured from Japan and the third countries. Therefore, manufacturers and its local agents must be responsible to render spare parts supply, and various technical services including repair and maintenance. Such being the situation, the Supplier must be equipped with the comprehensive maintenance and after sales service ability. It would be therefore preferred that the Equipment could be planned to be procured from the manufacturers who have its local agents in Bangladesh and or the neighboring countries as well.

1) The equipment for this project must meet the following preference which should be carefully mentioned in the specifications included in the tender documents.

   ① The local agents who will provide maintenance services must have their own workshops with adequate staff allocation.

   ② The project site must keep necessary spare parts and consumable items for the Equipment.

2) Local agents and their respective capacity have been checked at Basic Design stage and it is concluded that they are equipped with sufficient ability.

Procurement of Bangladesh products is limited but possible on the conditions that the quality is good and acceptable and their delivery schedule meets.

3) It takes for about 40 days to reach the Chittagong port and it is necessary to transport to so many project sites.
Procurement schedule together with installation schedule must have sufficient time allowance.

4) Japanese Firms will be nominated as the qualified Suppliers. The Supplier will be selected with the tender price and the compliance with the tender requirements carefully managed by the Consultant

The Supplier shall be the one who has submitted the lowest tender price. The tender price will be made on lump sum basis.

5) Transportation
The Equipment will be brought to Japanese port by truck and the ocean vessel will bring them to Bangladesh port (Chittagong). In-land transportation thereafter will be made by truck and other ways. As climate condition in Bangladesh is so sever, special export package as water proof is necessary. The Supplier must provide special care and attention to the Equipment while they are kept in Bangladesh until their installation and hand over.
Equipment delivery requirement is shown in Table-24 as follows.

Table-24 Delivery terms of major equipment

Item No.	Name of Equipment	Delivery Terms		
		Installation	Operation Manual	Training*
C-1	Anaesthesia Machine	○	○	○
C-2 / B-2	Labour Table	○	○	
C-4	OT Table	○	○	○
C-5	OT Light with Battery	○	○	○
C-6 / B-3	Autoclave	○	○	○
C-9 / B-5	Suction Pump	○	○	○
C-11 / B-8	Cylinder(with Oxygen Therapy unit)	○	○	○
C-24-1	Centrifuge	○	○	○
C-24-4	Blood Cell Counter	○	○	○
C-27 / B-21	Vacuum Extractor	○	○	○
C-34	Air Conditioner	○	○	○
C-35	Generator	○	○	○
C-37	Pulse Oxymeter	○	○	○

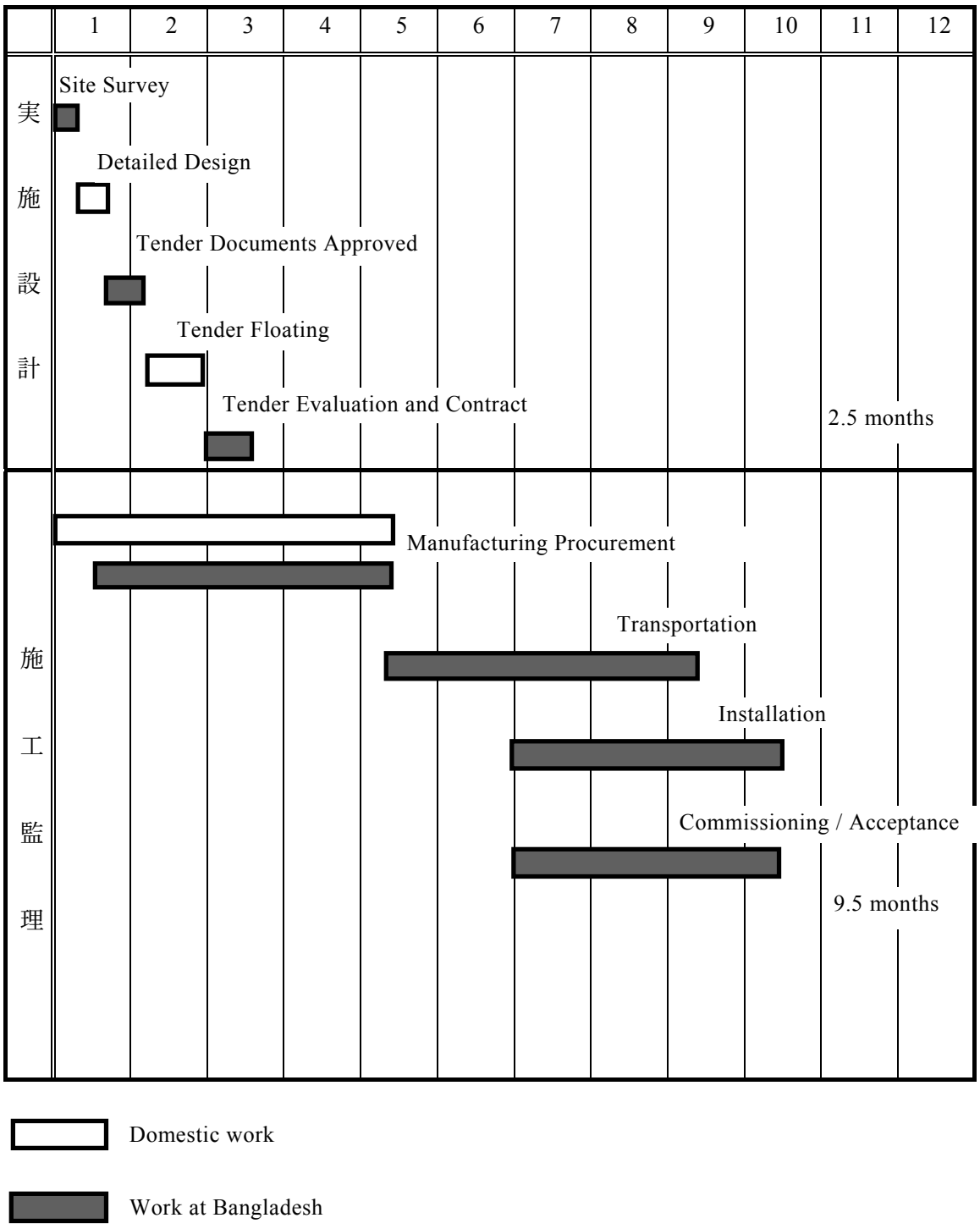
2-2-4-6 Implementation Schedule

The project implementation schedule will be divided into following stages.

1) Exchange of notes by both governments:
   Official notes exchanged for the execution of the Project.
2) Banking arrangement:
   Suitable bank will be selected for necessary banking procedures for the payment of the Project costs.
3) Consultant Service Agreement:
   Agreement to be concluded between the Government of Bangladesh and the Consultant.
4) Verification:
   Verification to be made to the Consultant Service Agreement by the Government of Japan.
5) Authorization to Pay:
   A/P for the Consultant to be issued by the Bangladesh authority after banking arrangement.
6) Tender Documents preparation:
   Consultant will prepare the Tender Documents to select the Supplier. The evaluation on the submitted tenders will be made jointly by the Government of Bangladesh. Supply Contract will be concluded between the Government of Bangladesh and the Supplier.
7) Verificatione:
   Verification to be made to the Supply Contract by the Government of Japan.
8) Authorization to Pay:
   A/P for the Supplier to be issued by the Bangladesh authority after banking arrangement.
9) Final approval of the drawings and specifications prepared and submitted by the Supplier to the Consultant. Careful check will be done by the Consultant on behalf of the Government of Bangladesh and will give approval to them.
10) Pre-shipment inspection:
    Pre-shipment inspection will be done by the Consultant on behalf of the Government of Bangladesh by inspection agency whether the equipment is made in accordance with the specifications and all the requirements in the tender documents.
11) Supervision by the Consultant:
    The Consultant will dispatch its technical experts to the site to enable necessary technical transfer to be made successfully to the Government of Bangladesh.
12) Schedule Management:
    The Consultant will carefully manage the procurement and installation schedule so as to finish the final acceptance within the specified time limit.
13) Commissioning and Completion:
    Test run and other necessary commissioning services work will be done by the Supplier under the presence and guidance of the Consultant. The final inspection report will be prepared by the Consultant and submitted to the Government of Bangladesh for their confirmation of the Project conclusion.

Overall implementation schedule is as follows.

Project Implementation Schedule



2-3 Obligations of Recipient Country

Necessary measures to be taken by the Government of Japan and the Government of Bangladesh in accordance with the Exchange of Notes.

1. To provide the land for temporary site office, warehouse and stock yard during the implementation period.

2. To exempt all types of taxes and duties and to take necessary measures for customs clearance of the materials and equipment procured for the Project at the port of disembarkation.

3. To exempt Japanese nationals involved in the Project under the verified contracts from customs duties, internal taxes including sales tax and other fiscal levies which may be imposed in Pakistan with respect to the supply of the products and the services under the verified contracts.

4. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry in Pakistan and stay therein for the performance of their work.

5. To maintain and use properly and effectively the equipment procured under the Grant.

6. To bear all the expenses other than those to be borne by the Grant, necessary in connection with the implementation of the Project.

7. To bear commissions to the Japanese foreign exchange bank for the banking services based on Banking Arrangement between the two governments.

8. To provide electricity, water supply, drainage and civil work on their own cost as explained in the Basic Design Study Report.

9. To provide the necessary staff under the criteria of selecting the instruments / equipment as explained in the Basic Design Study.

2-4 Project Operation Plan

1. Equipment Operation and Maintenance System

After handed over to each project site, equipment will be handled by the staffs of each THCs . Necessary manpower of each THCs such as medical officers and paramedical staff should be allotted and/or developed.

As planned equipment except anesthesia machine and pulse oxymeter are all substitute and/or replacement equipment, staffs of each THCs can easily handle these equipment.

And necessary staff like Anesthetist and Obstetric/Gynecology specialist for the new equipment, anesthesia machine and pulse oxymeter, are allotted and/or developed, these equipment can be also handled by them.

Each THCs are now re-preparing necessary maintenance system by nominating staff responsible for the equipment, and receiving the assistance from NEMEW and DEMEW ,planned equipment seemed to be well maintained.

2. Operation and Maintenance Cost

Most equipment to be supplied in this project are replacement and or additions of the deteriorated ones so that they do not need any additional maintenance costs except few equipment like anaesthesia machine and its related ones.

Thus, consequently, no additional operating costs are required for almost all the equipment.

The equipment which requires O/M cost is anesthesia machine, which will require following costs for its maintenance but they will be managed by each THCs..

Equipment	Consumables, Spares	unit	Amount(¥)
C-1 Anaesthesia machine	Patient Circuit	-	3,500
	Face Mask	-	7,500
	Breathing Bag	-	3,700
	Test Bag	-	5,700
	Mask Band	-	4,500
	CO2 Absorber	-	2,000
		(total)	(26,900)

Chapter 3 Project Evaluation and Recommendation

Chapter 3 Project Evaluation and Recommendation

3-1 Project Effect

The results obtained through implementing the project can be organized as shown in the following table.

Current situation and problems	Project countermeasures (undertakings targeted for cooperation)	Project results / degree of improvement
Because there are few facilities that can provide emergency obstetrics services for pregnant and nursing women in the 45 districts targeted for cooperation, pregnant and nursing women are unable to utilize these facilities, resulting in high mortality and morbidity rates for these women.	The necessary equipment and instruments at a targeted 47 Thana Health Complexes providing C-EOC services in 45 districts will be refurbished, as will the necessary equipment and instruments at a targeted 192 Thana Health Complexes providing B-EOC services.	The project will enable approximately 1.66 million pregnant and nursing women (an estimated 250,000 of whom have serious complications) in the 45 districts targeted for cooperation to utilize emergency obstetrics care services. This will contribute to lowering the maternal mortality and morbidity rates, and pediatric-related equipment such as warmers will make it possible to manage the body temperatures of infants and other types of care, helping to lower the infant mortality rate. Also, as a secondary result, because the project equipment and instruments are basic equipment and can also be used in fields outside of obstetrics, the project will contribute to improving basic medical services for the general population in the target area.
When medical personnel (midwives and other birth assistants) being trained by the “Development of Technical Resource Personnel in Reproductive Health”, a project-type cooperation currently being implemented, are assigned to the various facilities where the necessary equipment and instruments are not available, and services cannot be provided.	Same as above	Medical personnel (midwives, etc.) trained through project-type technical cooperation will be assigned to facilities targeted by the project, and will use the procured equipment and instruments, heightening the support efficacy.

The project has been evaluated as being an appropriate venue for grant aid assistance by Japan, based on a review of the results of items (1) to (5) below.

(1) The facilities targeted for cooperation consist of Thana Health Complexes in 45 of the country's 64 districts. They provide primary and secondary medical care, and are medical facilities that serve as the basis of the medical care system in Bangladesh. The project will benefit the local population, including 1.66 million (estimated annual figure) pregnant and nursing women in the 45 districts who will benefit directly from the project, and 83 million people, primarily in the poverty class, who will benefit indirectly.

(2) The project is directly tied to lowering the maternal mortality and morbidity rates (those for pregnant and nursing women), which is the foremost priority of the Health and Population Sector Strategy, and will contribute to achieving the goals of Bangladesh's mid- and long-term development planning.

(3) Many of the target facilities are located in small local cities and towns, and in addition to minimizing the gap between medical services provided in urban and local areas, and by refurbishing the medical system involving maternal care, the project will be linked to holding down the population, which is the foremost issue for Bangladesh, where the number of planned births has been rising. The project is thus one that will contribute to stabilizing the civil government of Bangladesh and to improving the lifestyle of the people.

(4) As described earlier, it is anticipated that ample use can be made of the procured equipment and instruments. In addition, because the project targets mainly the upgrading of equipment and instruments that involve very few maintenance expenses and are already owned, Bangladesh will be able to handle operation and maintenance control using its own funds, human resources, and technology, and a high level of sophisticated technology will not be required.

(5) Because most of the project equipment and instruments will be upgraded or replaced, the facilities at which the procured equipment and instruments would be set up and installed have already been, or are being, refurbished, and basic requirements such as water supply and drainage systems and electricity supply systems are already in place. The Bangladesh Ministry of Health and Family Welfare has already been the recipient of grant aid assistance from Japan in the past, and no problems are foreseen with respect to implementing the project under Japan's system of grant aid assistance.

3-2 Recommendations

The issues listed below must be addressed by Bangladesh in order to make maximum use of the equipment and instruments procured through the implementation of the project and to achieve and sustain the resulting effects.

(1) The continuation of the health and medical policies of Bangladesh

The current policies, which target the integration of health and population policies and are aimed at providing the people with the necessary health and medical services (Essential Service Package), as well as at suppressing increases in the population, must be maintained by Bangladesh with cooperation from the World Bank and other donors.

(2) The establishment of administrative systems for public medical institutions and the establishment of budgets and finances for health and medical care

The Ministry of Health and Family Welfare needs to set up administrative systems for public medical institutions and to provide the necessary medical personnel, along with allocating the necessary budgets. In particular, because the budget allocations for Thana Health Complexes are less sufficient than those for other medical institutions due to harsh financial circumstances, the Ministry needs to strive for improvements such as having the recipients of medical care pay part of the cost.

(3) The elimination of various factors that hinder access to medical institutions, and the boosting of the degree of utilization

The Ministry of Health and Family Welfare must continue to promote policies designed to facilitate changes in the action and behavior of local societies, including those of pregnant and nursing women (such as education that encourages the use of facilities and instructional activities that teach the population about hygienic and safe births), in order to boost the rate of utilization of medical institutions by local residents.