

PEOPLE'S REPUBLIC OF BANGLADESH  
MINISTRY OF HEALTH  
AND FAMILY WELFARE

**THE PREPARATORY SURVEY ON  
MATERNAL, NEONATAL AND CHILD  
HEALTH IMPROVEMENT PROJECT  
(HEALTH, POPULATION AND NUTRITION  
SECTOR DEVELOPMENT PROGRAM)  
(PHASE 2)  
IN THE PEOPLE'S REPUBLIC OF  
BANGLADESH  
  
FINAL REPORT**

May 2015

Japan International Cooperation Agency (JICA)

C.D.C International Corporation  
Oriental Consultants Global Co., Ltd.

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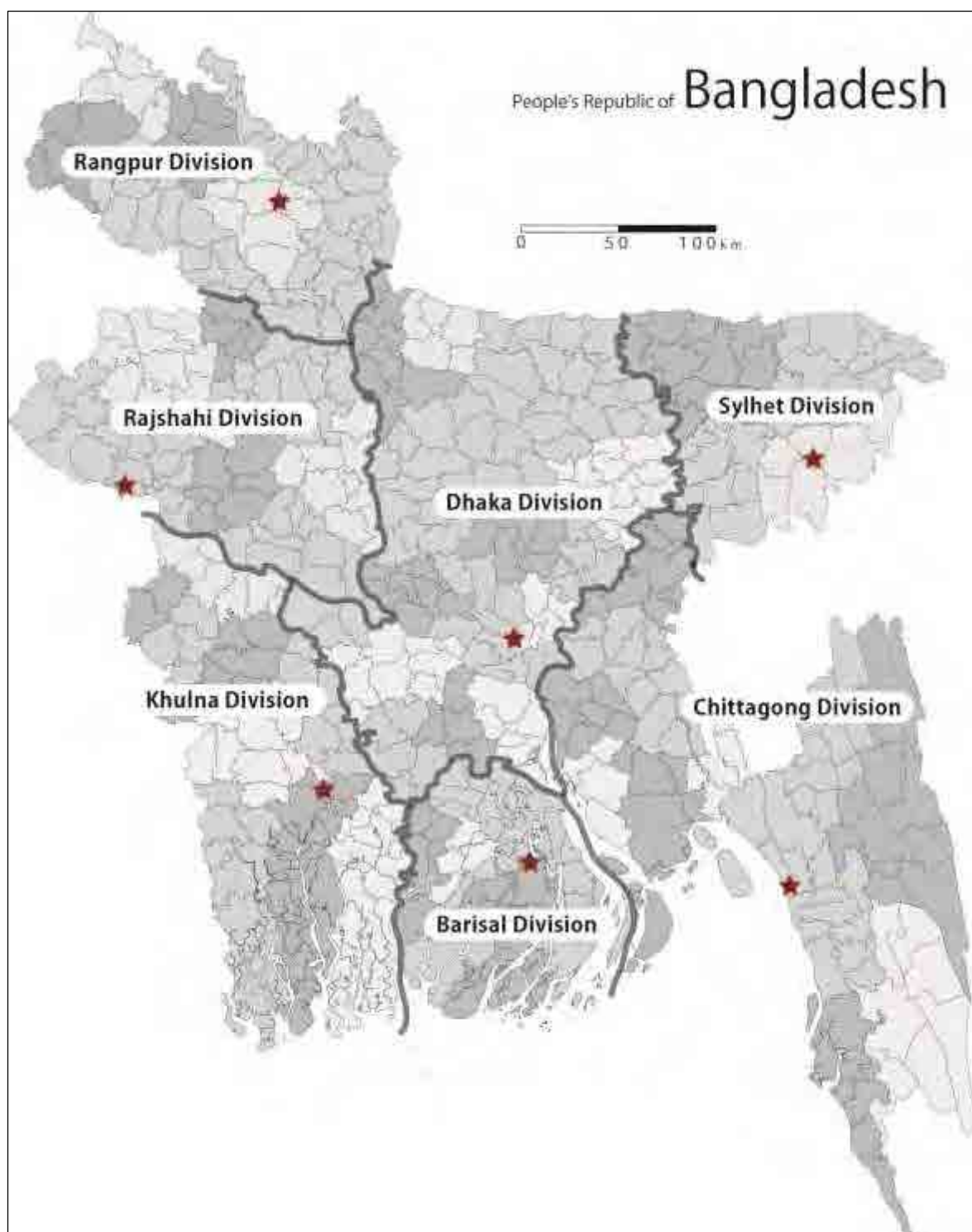
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## Currency

<p>US\$ 1 = 119 Yen = 77.5 Taka (1 Taka = 1.54 Yen) (as of January 2015)</p>
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## Maps

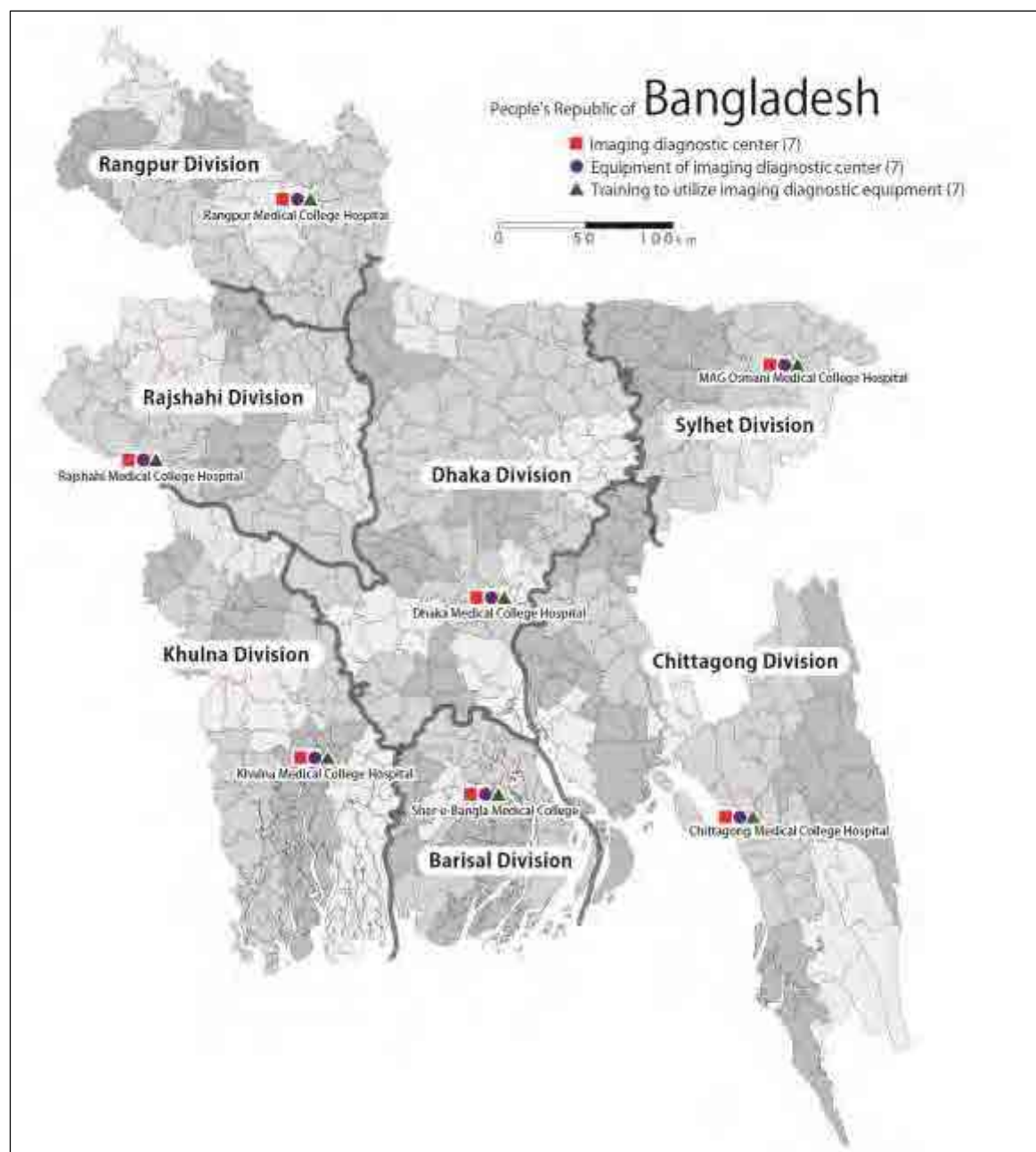
Project site map (overall)



Project site map for sub-projects within HPNSDP 2011-2016



Project site map for sub-projects beyond HPNSDP 2011-2016





## Pictures

### Candidate Target Medical College Hospitals



Dhaka Medical College Hospital



Chittagong Medical College Hospital



Barisal Medical College Hospital



Rangpur Medical College Hospital



Rajshahi Medical College Hospital



Khulna Medical College Hospital

## Candidate Nursing Colleges and Hostels



Dhaka Nursing College



Mymensingh Nursing College



Chittagong Nursing College



Barisal Nursing College



Rangpur Medical College



Rajshahi Medical College Hospital



## Meetings



At Dhaka Nursing College



At Chittagong Nursing College



At Barisal Nursing College



At Rajshahi Medical College Hospital



At Rangpur Medical College Hospital



At Khulna Medical College Hospital

## Abbreviations

ACP	Aluminium Cladding Panel	CCSD	Purchase
AD	Assistant Director	CCU	Clinical Contraception Services Delivery
ADB	Asian Development Bank	CDA	Coronary Care Unit
ADP	Annual Development Program	CDC	Chittagong Unnayan Authority
AIA	Archaeological Impact Assessment	CDC	Communicable Disease Control
AIDS	Acquired Immunodeficiency Syndrome	CEmOC	Comprehensive Emergency Obstetric Care
AMC	Alternative Medical Care	CG	Community Group
ANC	Antenatal Care	CHCP	Community Healthcare Provider
APIR	Annual Program Implementation Report	CICU	Coronary Intensive Care Unit
APR	Annual Program Review	CIF	Cost, Insurance and Freight
ASTM	American Society for Testing and Materials	CME	Centre for Medical Education
AVR	Auto Voltage Regulator	CMMU	Construction, Maintenance and Management Unit
BASI	Bangladesh Association of Construction Industries	CMSD	Central Medical Stores Depot
BBS	Bangladesh Bureau of Statistics	CPTU	Central Procurement Technical Unit
BCG	Bacillus Calmette Guerin	CR	Computer Radiography
BCPS	Bangladesh College of Physicians and Surgeons	CS	Civil Surgeon
BDHS	Bangladesh Demographic and Health Survey	CSBA	Community-based Skilled Birth Attendant
BDS	Bachelor of Dental Surgery	C-section	Caesarean Section
BDT	Bangladesh Taka	CSG	Community Support Group
BEmOC	Basic Emergency Obstetric Care	CX-Ray	Chest X-Ray
BER	Bid Evaluation Report	GX-Ray	General X-Ray
BFD	Bangladesh Forest Department	CT	Computed Tomography
BHE	Bureau of Health Education	CVA	Cerebrovascular Accident
BHFS	Bangladesh Health Facility Survey	DCA	Development Credit Agreement
BHW	Bangladesh Health Workforce	DCH	Diploma in Child Health
BMDC	Bangladesh Medical and Dental Council	DDPC	Deputy Director of Procurement (CMSD)
BMMS	Bangladesh Maternal Mortality Survey	DEMEMW	District Equipment Maintenance and Engineering Workshop
BNBC	Bangladesh National Building Code	DENT	Dentistry
BNC	Bangladesh Nursing Council	DFATD	Department of Foreign Affairs, Trade and Development
BNHA	Bangladesh National Health Accounts	DFID	Department for International Development
BOQ	Bill Of Quantities	DG	Director General
BPC	Bangladesh Pharmacy Council	DGDA	Directorate General of Drug Administration
BSc	Bachelor of Science	DGFP	Directorate General of Family Planning
BSMMU	Bangabandhu Sheikh Mujib Medical University	DGHS	Directorate General of Health Services
BSRI	Bangladesh Society of Radiology and Imaging	DH	District Hospital
BUET	Bangladesh University of Engineering and Technology	DICOM	Digital Imaging and Communication in Medicine
CABG	Coronary Artery Bypass Grafting	DMCH	Dhaka Medical College Hospital
CAG	Cardio Angiography and Coronary Angiography	DNS	Directorate of Nursing Services
CBE	Clinical Breast Examination	DOA	Department of Architecture
CBHC	Community Based Health Care	DOE	Department of Environment
CC	Community Clinic	DOGA	Department of Government
CCGP	Cabinet Committee of Government		

	Accommodation		Immunization
DOTS	Directly Observed Treatment-Short Course	GDP	Gross Domestic Product
DP	Development Partner	GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
DPA	Direct Project Aid	GH	General Hospital
DPM	Deputy Project Manager	GI	Gastrointestinal
DR	Digital Radiography	GIZ	Gesellschaft für Internationale Zusammenarbeit
DS	Deputy Secretary	GOB	Government of Bangladesh
DU	Dhaka University	GP	General Physician
EBP	Evidence Based Practice	HA	Health Assistant
EC	European Commission	HAI	Healthcare-Associated Infection
ECA	Environmental Conservation Act	HBRI	Housing & Building Research Institute
ECC	Environmental Clearance Certificate	HBV	Hepatitis B Virus
ECG	Electrocardiography	HCC	Hospital Coordination Committee
ECNEC	Executive Committee of National Economic Council	HCV	Hepatitis C Virus
ECR	Environmental Conservation Rule	HED	Health Engineering Department
EDCF	Economic Development Cooperation Fund	HEF	Health Economics and Financing
EDCL	Essential Drugs Company Limited	HEP	Health Education and Promotion
EIA	Environmental Impact Assessment	HEU	Health Economics Unit
EIRR	Economic Internal Rate of Return	HFWC	Health and Family Welfare Center
EmOC	Emergency Obstetric Care	HIS-EH	Health Information System and E-Health
EMOP	Environmental Monitoring Plan	HIV	Human Immunodeficiency Virus
EMP	Environmental Management Plan	HIV/AIDS	Human Immunodeficiency virus/ Acquired Immunodeficiency Syndrome
ENC	Essential Newborn Care	HMPD	Health Manpower Development
ENT-HN	Ear, Nose and Throat- Head and Neck	HNP	Health, Nutrition and Population
EOC	Emergency Obstetric Care	HNPS	Health, Nutrition and Population Sector Program
EPI	Expanded Program on Immunization	HPNSDP	Health, Population and Nutrition Sector Development Program
ERC	Endoscopic Retrograde Cholangiopancreatography	HPSP	Health and Population Sector Program
ERCP	Endoscopic Retrograde Cholangio Pancreatography	HR	Human Resource
ERD	Economic Relations Division	HRH	Human Resource(s) for Health
ES	Engineering Service	HRM	Human Resources Management
ESD	Essential Service Delivery	HSC	Higher Secondary Certificate
ESMS	Environmental and Social Management System	HSM	Hospital Service Management
EU	European Union	HTN	Hypertension
F/F	Fact Finding	IBC	International Building Code
FCP	Foreign Currency Portion	IBD	Inflammatory Bowel Disease
FCPS	Fellow of the College of Physicians and Surgeons	IBRD	International Bank for Reconstruction and Development
FIRR	Financial Internal Rate of Return	ICB	International Competitive Bidding
FPI	Family Planning Inspector	ICD	International Statistical Classification of Diseases and Related Health Problem
FF&TR	Children of freedom fighters and tribal students	ICDDR	International Center for Diarrhoeal Diseases Research
FMAU	Financial Management and Audit Unit	ICMH	Institute of Child and Mother Health
FP	Family Planning	ICT	Information and Communication Technology
PPFSD	Family Planning Field Services Delivery	IC/R	Inception Report
FPI	Family Planning Inspector	ICU	Intensive Care Unit
FWA	Family Welfare Assistant	IDA	International Development Association
FWC	Family Welfare Centre	IEC	Information, Education and Communication
FWV	Family Welfare Visitor		
FWVTI	Family Welfare Visitor Training Institute		
FY	Financial Year		
GAVI	Global Alliance for Vaccine and		

IEDCR	Institute of Epidemiology, Disease Control & Research	MIC	Middle Income Country
IEE	Initial Environmental Examination	MIS	Management Information System
IFB	Invitation for Bidding	MMR	Maternal Mortality Ratio
IFM	Improved Financial Management	MNCAH	Maternal, Neonatal, Child and Adolescent Health
IHT	Institute of Health Technology	MNCH	Maternal, Neonatal and Child Health
IMCI	Integrated Management of Childhood Illness	MNH	Maternal and Neonatal Health
IMED	Implementation Monitoring and Evaluation Division	MO	Medical Officer
IMMS	Infrastructure Management Monitoring and Supervision	MOEF	Ministry of Environment and Forests
IMO	Indoor Medical Officer	MOF	Ministry of Finance
IPH	Institute of Public Health	MOFA	Ministry of Foreign Affairs
IPS	Instant Power System	MOHFW	Ministry of Health and Family Welfare
IRCME	International Research Center for Medical Education	MOHPW	Ministry of Housing and Public Works
IST	In-service Training	MOPA	Ministry of Public Administration
IT	Information Technology	MPH	Master of Public Health
IV	Intravenous	M.Phil.	Master of Philosophy
IVR	Interventional Radiology	MRCP	Magnetic Resonance Cholangiopancreatography
JICA	Japan International Cooperation Agency	MRI	Magnetic Resonance Imaging
JOCV	Japan Overseas Cooperation Volunteer	MS	Master of Science
JSC	Junior Secondary Certificate	MSH	Management Science for Health
JV	Joint Venture	MTR	Mid-term Review
KDA	Khulna Unnayan Authority	NASP	National AIDS and STD Program
KFW	KFW Entwicklungsbank	NC	Nursing College
KOICA	Korea International Cooperation Agency	NCB	National Competitive Bidding
KUB	Kidney, Ureter and Bladder	NCD	Non Communicable Diseases
LAB	Laboratory	NCDC	Non Communicable Disease Control
LCB	Local Competitive Bidding	NCRP	National Council on Radiation Protection and Measurements
LCP	Local Currency Portion	NEC	National Eye Care
LD	Line Director	NEMEW	National Equipment Maintenance and Engineering Workshop
LDC	Least Developed Countries	NES	Nursing Education and Services
LDR	Labor and Delivery Room	NGO	Non-governmental Organization
LED	Light-Emitting Diode	NHA	National Housing Authority
LGED	Local Government Engineering Department	NICRH	National Institute of Cancer Research and Hospital
LGR	Local Government Representative	NICU	Neonatal Intensive Care Unit
LTM	Limited Tender Method	NICVD	National Institute of Cardiovascular Diseases
M&E	Monitoring & Evaluation	NIDCH	National Institute of Diseases of Chest and Hospital
MBBS	Bachelor of Medicine and Bachelor of Surgery	NIKDU	National Institute of Kidney Diseases and Urology
MCH	Medical College Hospital	NIMHR	National Institute of Mental Health and Research
MCHTI	Maternal and Child Health Training Institute	NIO	National Institute of Ophthalmology
MCRAH	Maternal, Child, Reproductive and Adolescent Health	NIPORT	National Institute of Population Research and Training
MCWC	Maternal and Child Welfare Center	NIPSOM	National Institute of Preventive and Social Medicine
MD	Doctor of Medicine	NITOR	National Institute of Traumatology, Orthopedics and Rehabilitation
MDG	Millennium Development Goal	NNS	National Nutrition Services
ME	Monitoring and Evaluation	NOA	Notification of Award
METI	Ministry of Economy, Trade and Industry	NPV	Net Present Value
MES	Military Engineering Services	NTC	Nurses Training Centre
MFSTC	Mohammadpur Fertility Services and Training Centre		
MHLW	Ministry of Health, Labour and Welfare		



NTP	National TB Program	RAP	Resettlement Action Plan
O&M	Operation and Maintenance	RAJUK	Rajshahi Unnayan Kartioakkha
OBGY	Obstetrical and Gynaecology	RCHCIB	Revitalization of Community Healthcare Initiative in Bangladesh
ODA	Official Development Assistance	RDA	Rajshahi Unnayan Authority
OGSB	Obstetrical and Gynaecological Society of Bangladesh	RDL	Radiology
OP	Operational Plan	RDRS	Rangpur Dinajpur Rural Services
OPD	Outpatient Department	RIS	Radiology Information System
OT	Operation Theatre	RO	Regional Officer
PA	Project Aid	RPA	Reimbursable Project Aid
PACS	Picture Archiving and Communication System	RTC	Regional Training Centre
PAG	Pelvic Angiography	RTY	Radiotherapy
PCC	Particular Conditions of Contract	SACMO	Sub-Assistant Community Medical Officer
PCR	Polymerase Chain Reaction	SBA	Skilled Birth Attendant
PD	Project Director	SBD	Standard Bidding Documents under Japanese ODA Loans
PET	Positron Emission Tomography	SC	Steering Committee
PFD	Physical Facilities Development	SCANU	Special Care Newborn Unit
PG	Performance Guarantee	SCANU	Special Care Newborn Unit
PH	Public Health	SCC	Site Clearance Certificate
PHAR	Pharmacy	SDAM	Strengthening of Drug Administration and Management
PIC	Project Implementation Committee	SEARO	South-East Asian Regional Office
PIU	Project Implementation Unit	SEI	Socio Economic Infrastructure
PLMC	Procurement and Logistics Management Cell	SFYP	Sixth Five Year Plan
PLSM	Procurement, Logistics and Supplies Management	SI	Sanitary Inspection
PM	Project Manager	SIAPS	System for Improved Access to Pharmaceutical Services
PME	Planning, Monitoring and Evaluation	SIDA	Swedish International Development Cooperation Agency
PMMU	Program Management & Monitoring Unit	SMCH	Sylhet Medical College Hospital
PMR	Planning, Monitoring and Research	SMF	State Medical Faculty
PMS	Project Management Service	SMPP	Safe Motherhood Promotion Project
PNC	Postnatal Care	SOP	Standard Operating Procedure
PNS	Paranasal Sinus	SOR	Schedule of Rates
PPA	Public Procurement Act	SPQD	Standard Prequalification Documents under Japanese ODA Loans
PPA	Project Preparation Advance	SRFP	Standard Request for Proposals under Japanese ODA Loans
PPM	Permanent Pacemaker	SSC	Secondary School Certificate
PPR	Public Procurement Rules	STI	Sexually Transmitted Infection
PQ	Pre-Qualification	SWAp	Sector wide approach
PRSP	Poverty Reduction Strategy Paper	SWPMM	Sector-Wide Program Management and Monitoring
PSC	Primary School Certificate	TB	Tuberculosis
PSC	Project Steering Committee	TB-LC	TB and Leprosy Control
PSE	Pre-Service Education	TEC	Tender Evaluation Committee
PSSM	Procurement, Storage and Supplies Management	TEMO	Transport & Equipment Maintenance Unit
PTCA	Percutaneous Transluminal Coronary Angioplasty	THE	Total Health Expenditure
PTMC	Percutaneous Transvenous Mitral Commissurotomy	TMNCP	Tangail Maternal, Neonatal and Child Health Program
PTY	Physiotherapy	TOC	Tender Opening Committee
PUD	Peptic Ulcer Disease	TOE	Table of Equipment
PWD	Public Works Department	TOR	Terms of Reference
QA	Quality Assurance	TOT	Training of Teachers
QBS	Quality-Based Selection		
QOL	Quality of Life		
RADP	Revised Annual Development Program		



TQM	Total Quality Management	UNFPA	United Nations Population Fund
TRD	Training, Research and Development	UNICEF	United Nations Children's Fund
TTU	Technical Training Unit	UNSW	The University of New South Wales
UBC	Uniform Building Code	UPS	Uninterruptible Power Supply
UDD	Department of Urban Development	USA	United States of America
UHC	Upazila Health Complex	USD	US Dollar
UHC	Universal Health Coverage	USAID	U.S. Agency for International Development
UHFPO	Upazila Health and Family Planning Officer	USC	Union Sub-center
UHFWC	Union Health and Family Welfare Center	USG	Ultra Sound Graphy
UHS	Upazila Health System	VIA	Visual Inspection with Acetic acid
UNAIDS	Joint United Nations Programme on HIV/AIDS	WA	Whole Abdomen
		WB	World Bank
UNESCO	United Nations Educational, Scientific and Cultural Organization	WHO	World Health Organization

## Local Words

Lac/Lakh	100 Thousand
Crore	10 Million

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## **Executive Summary**

### **1. Background and Objectives of the Survey**

Major improvements have been made in Bangladesh's health sector, especially in the area of maternal and child health, such as improvements in the infant mortality rate (94 per 1,000 live births in 1990 and 43 in 2011), the under five mortality rate (144 per 1,000 live births in 1990 and 53 in 2011), and the maternal mortality ratio (574 per 100,000 live births in 1990 and 194 in 2010). However, further efforts are needed to achieve the Millennium Development Goals (MDGs), for which major challenges remain unsolved, including the maternal, neonatal and child health (MNCH) service coverage and nutritional problems.

Further, non-communicable diseases (NCDs) are on the rise, accounting for 61% of the country's total burden. The major factors contributing to NCDs include changing dietary habits and lifestyles, and traffic-related injuries, which cause increases in health-care-related household expenses.

Therefore, it is expected that the "Maternal, Neonatal, and Child Health and Health System Improvement Project (the Yen Loan Project Phase 2)" will help improvement of MNCH and service provision in response to emerging issues reflecting urgent needs in the health sector. This preparatory survey of the Yen Loan Project Phase 2 aims;

- to conduct an in-depth analysis of various issues related to the Yen Loan Project Phase 2 implementation, such as the detailed plan; cost estimates; the implementation, operation, and maintenance structure; and environmental and social considerations
- to propose the potential scope and scale for JICA's further financial assistance for the last 15 months of Health, Population and Nutrition Sector Development Program (HPNSDP) 2011–2016 after Phase 1 ends, and for beyond HPNSDP 2011–2016

### **2. Methodology of Survey**

The survey targeted primary, secondary and tertiary health facilities and governmental agencies working in the areas of health, public works, and environmental issues. The methodologies used in the survey were Bibliographic survey, Interviews with relevant personnel at health facilities and governmental agencies, Physical assessment of the health facilities and Price surveys for equipment, materials and labor.

### **3. Results of the In-Depth Analysis**

#### **(1) Health Situation**

Bangladesh has been making good progress in almost all of the health-related MDGs, especially the child mortality rates, indicators of communicable diseases, and maternal



mortality ratio. Conversely, NCDs including injury related mortality rate has been rapidly increasing since the early 1990s because of its epidemiological and demographical transitions.

## (2) Maternal, Neonatal and Child Health Service

The Survey Team identified mainly four needs to improve the current MNCH services, such as; strengthening MNCH service provision in communities, improvement of Comprehensive Emergency Obstetric Care (CEmOC), upgrading the newborn care facilities such as Neonatal Intensive Care Units (NICUs) and Special Care Newborn Units (SCANU), and improvement definitive diagnosis capacity for female-specific cancers.

Community clinics (CC) are frontline health facilities. While MNCH service is provided based on the CCs, the plan to construct new CCs has been delayed because almost all of the planned CCs cannot bring about agreement with landholders.

The biggest challenge in promoting MNCH services in Bangladesh is shortage of female service providers such as Family Welfare Visitors (FWVs), doctors and nurses in terms of the quality and quantity. The improvement and/or upgrading of CEmOC, NICU and SCANU must be important for reducing maternal and neonatal mortality rates, but they can never function sufficiently without experienced and skillful medical staff.

According to Health Bulletin 2013, major cancer types among female were breast cancer (25.8%) and cervix cancer (20.5%). Maternal, Child, Reproductive and Adolescent Health (MCRAH) Operational Plan (OP) promotes screening for these cancers by Visual Inspection with Acetic acid (VIA) and Clinical Breast Examination (CBE) in communities. However, detected positive cases cannot have definitive diagnoses because few public health facilities in Bangladesh have the necessary equipment such as mammography or female radiographers.

## (3) Medical Equipment

The Survey Team confirmed that many patients concentrate in Medical College Hospital (MCH) of respective division, expecting better examination and treatment. As the result of it, the MCHs are always too crowded to handle them. Existing imaging diagnostic equipment of MCHs is overused. Many of them have already been degradation and/or a penchant for malfunctioning.

As mentioned above, the NCD related mortality rate has been increasing in Bangladesh since the 1990s. Recently, it is getting to increase the importance to detect them in the early stages through imaging diagnostic equipment and to provide appropriate treatment.

MCHs do not organize individual patient's data and information in chronological manner,

and it cannot be referred when needed. The digital data management system should be useful for them.

Furthermore, in terms of coordination with JICA's support and Universal Health Coverage (UHC), it is necessary to improve the medical equipment of District Hospitals (DHs). The equipment for skill laboratory in BSc nursing colleges is also necessary in terms of coordination with JICA's support and UHC through improvement of quality of nursing education and increase of nurses.

#### (4) Health Facilities

With the installment of imaging diagnostic equipment to MCHs, it is necessary to ensure radiation shield. Japanese technology can be used to improve protection against radiation exposure through facility design and special materials.

Existing equipment has been installed in their main building, but renovation for the radiation shields has a risk to damage on the main building structure. Thus it will be better to newly construct an independent building for imaging diagnostic equipment (imaging diagnostic center) adjacent to the main building.

Some BSc nursing colleges have been struggling with shortage of classrooms and students' hostels because of the rapid increasing the number of students. As the shortage of hostel rooms is possible to interrupt the students' studying near future, the construction of hostels should be conducted prior to the construction of classrooms.

#### (5) Human Resources for Health

In the health sector in Bangladesh, the shortage of human resources is crucial issue. Human resource development generally takes a longer period. The Survey Team identified the areas with high and urgent human resource development, such as;

- Nursing education
- Up grading the skills of doctors and medical technologists
- Training in diagnostic imaging and operation of equipment for doctors and medical technologists
- Training in user maintenance of imaging diagnostic equipment for medical technologists
- Training in patient information management

#### (6) Hospital Management

Patients prefer more specialized and better equipped hospitals if they are to pay the same fees at any hospitals. MCHs as well as other hospitals at secondary and tertiary levels

provide 24 hour emergency services. Since too many people visit the emergency department of MCHs, the hospitals are not able to meet the demand within regular working hours. As result of it, many outpatients cannot receive consultations even though they have been waiting from the morning.

This situation indicates the necessity of health referral system reform. Although the fundamental approach can be strengthening secondary hospitals, it is difficult to increase immediately the number of medical staff enough to function the secondary hospitals. Therefore, strengthening MCHs must be prioritized until the secondary hospitals are sufficiently upgraded.

MCHs as teaching hospitals provide various knowledge and skills through medical practices, such as; correct clinical procedures, medical ethics, bio-safety, patient-oriented medicine and evident-based medicine. Digitalized information can be useful for teaching materials and sharing various cases with interns and other trainees.

#### 4. Selection Criteria for Sub-Projects

##### (1) Sub-project within HPNSDP 2011-2016

The JICA has supported MNCH services through the Safe Motherhood Promotion Project (SMPP) 2 and the Yean Loan Project Phase 1. In order to contribute to the goals of HPNSDP 2011-2016, the continuous support is necessary. From this point of view, the Survey Team will propose the sub-project within the framework of HPNSDP 2011-2016 as followings;

- 1) Community-based MNCH services
- 2) Provision of medical equipment at 6 renovated and/or expanded DHs supported by the JICA
- 3) Improvement of BSc nursing colleges

##### (2) Sub-project beyond HPNSDP 2011-2016

To respond to the urgent need for reducing NCDs, improvement of imaging diagnostic services in seven MCHs has been considered. This involves some activities related to radiology imaging diagnosis as mentioned above. Therefore the Survey Team integrated these activities and proposed the establishment of an “Imaging Diagnostic Center” in each division.

Establishment of Imaging Diagnostic Center is not planned in NCDC OP in HPNSDP 2011-2016 and this will be a long-term project beyond 2016. Therefore it is proposed as sub-projects beyond HPNSDP 2011-2016.

## 5. Plan for the Project

Based on the results of the in-depth analysis, the Survey Team has proposed a framework for the JICA Yen Loan Project Phase 2. The details are as follows.

### (1) Plan for the Project

- 1) Sub-project within HPNSDP 2011–2016: Improving MNCH and the Health System under HPNSDP 2011–2016

Activities	Sub-projects	JICA Policy	Target OP
Facility	New construction of female students' hostel building in 7 BSc Nursing Colleges	JICA project coordination	PFD NES
	Extension of academic buildings in 7 BSc Nursing Colleges	JICA Project Coordination	PFD NES
	Furniture for new buildings in 7 BSc Nursing College	JICA Project Coordination	NES
	New Construction of CCs (2 rooms)	UHC	CBHC PFD
Equipment	Installation of equipment for skill laboratory in 6 BSc Nursing Colleges	JICA Project Coordination	NES
	Distribution of MCH kit and FWC kit to UHFwCs	JICA Yen Loan Phase 1	MCRAH
	Installation of medical equipment at the renovated/expanded 6 DHs supported by yen loan Phase 1	JICA Yen Loan Phase 1	HSM
Training	Training of CSG in FY2015-2016	JICA Project Coordination (SMPP2)	CBHC
	Training for FWVs on midwifery	JICA Yen Loan Phase 1	MCRAH
	Training for FWVs on EmOC	JICA Yen Loan Phase 1	MCRAH

### 2) Sub-project beyond HPNSDP 2011–2016: Strengthening Imaging Diagnostic System

This sub-project aims to improve the quality of imaging diagnosis in seven MCHs. It has three components: i) provision of imaging diagnostic equipment, ii) new construction of imaging diagnostic centers, and iii) training to utilize imaging diagnostic equipment. The target MCHs are Sher-e-Bangla MCH (Barisal), Chittagong MCH, Dhaka MCH, Khulna MCH, Rajshahi MCH, Rangpur MCH, and M.A.G. Osmani MCH (Sylhet).

### (2) Project Implementation Structure

**Executive Agency:** Ministry of Health and Family Welfare (MOHFW)

**Implementing Agency for the sub-projects within HPNSDP 2011–2016:**

OPs under the directorates shall be responsible, with coordination by the Joint Chief of the Planning Wing, MOHFW.

**Implementing Agency for the sub-projects beyond HPNSDP 2011–2016:**

**The Project Implementation Unit (PIU):** PIU established in DGHS with coordination by the Joint Chief of the Planning Wing, MOHFW. PIU shall be organized, and headed by Director General of DGHS, MOHFW. The main activities of PIU are; 1) Carry out trainings to utilize

diagnostic imaging equipment in MCHs, 2) Providing diagnostic imaging equipment in MCHs, 3) Newly constructing diagnostic imaging centers in MCHs. The members are; DGHS (Director General, Director and Asst. Director of Hospital and Clinics), Facility specialists such as Department of Architecture (DOA) and Public Works Department (PWD) in Ministry of Housing and Public Works (MOHPW), Equipment specialist such as Hospital & Clinics, Central Medical Stores Depot (CMSD), and National Equipment Maintenance and Engineering Workshop (NEMEW), Accountants (Finance Dept. DGHS), coordinator and driver.

**Project Steering Committee (PSC):** PSC shall be organized, and chaired by the Secretary, MOHFW to coordinate related agencies to monitor the progress of the project, and to make necessary decisions. The proposed members are; the representatives of DGHS (Planning, Hospital & Clinics), MOHFW (Project Implementation, Planning Wing), DOA, PWD, Programming Division/ the Planning Commission (Socio Economic Infrastructure (SEI)), Economic Relations Division (ERD)/Ministry of Finance, Implementation Monitoring and Evaluation Division (IMED)/Ministry of Planning and the Project Director.

**Project Implementation Committee (PIC):** PIC shall be organized, and chaired by Director General, DGHS to coordinate related agencies to monitor the progress of the project, and to make necessary suggestions. The proposed members are; the representatives of concerned hospitals, MOHFW (Project Implementation, Planning Wing, concerned desk), Hospital and Clinics/DGHS, DOA, PWD, Programming Division/Planning Commission, ERD, IMED and the Deputy Project Director.

**Hospital Coordination Committee (HCC):** The target MCHs organize a Coordination Committee (HCC) in each hospital. The HCC is headed by Director to coordinates with the PIU to implement activities. The members are selected from the appropriate departments of MCHs.

## 6. Evaluation of the Project

### (1) Indicators for sub-project within HPNSDP 2011-2016

The indicators of the sub-projects within HPNSDP 2011-2016 were set as shown in the table below to evaluate the outcome of investment for community-based MNCH services through target OPs.

Indicators	Original (Yr 2014)	Target (Yr 2016)
Number of Community Support Groups trained	37,731	48,000
Percentage of delivery by skilled attendant	34.4% (UESD 2013)	50%
Antenatal care coverage (at least 4 visits)	25% (UESD 2013)	50%

In addition, the following indicators of investment for BSc nursing colleges were set,

considering the collaboration with future technical cooperation in nursing education by JICA.

- Quantitative indicator: Completion rate of seven BSc nursing colleges is increased.
- Qualitative indicator: Quality of nursing education is improved.

(2) Indicators for sub-projects beyond HPNSDP 2011-2016

1) Quantitative indicators

- Number of examinations by each diagnostic imaging equipment and endoscopy
- Radiation exposure level at waiting rooms in the diagnostic imaging center
- Radiation exposure level of radiologists/ radiographers working in the diagnostic imaging center

2) Qualitative indicators

- Patients' satisfaction of the medical services provided in the diagnostic imaging center
- Medical workers' motivation in working at diagnostic imaging center.
- Evidence-based medicine by utilizing the results of diagnostic imaging examinations
- Clinical research by utilizing the results of diagnostic imaging examinations

(3) Financial and Economic Evaluation

The Survey Team attempted Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) analysis of the sub-project beyond HPNSDP 2011–2016 (Component-2). The net benefit and FIRR of the Component 2 will be negative. If the target hospitals increase examination fee, the indicators will be favorable return. However, it is impossible because the target hospitals have the mandate to provide their medical services for all the people, especially for who cannot afford to go to private hospital.

The Component-2 is expected to produce positive economic benefits in collaboration with other factors. Especially, the people living in remote area can increase accessibility to the examination with lesser cost. Also the improved imaging diagnostic equipment can accelerate the early detection capacity of the target MCHs, and it leads to controlling the lost profit (opportunity cost) occurred by aggravating the diseases to the serious condition. However, it is difficult to evaluate the investment in terms of economic internal return rate because of limited numeral data and information.

## 7. Social and Environmental Considerations

Sub-projects within HPNSDP are categorized Orange-B, according to Environment Conservation Rules (ECR), 1997 of Bangladesh, required Initial Environmental Examination (IEE). Sub-projects beyond HPNSDP are categorized Red, required IEE and Environmental Impact Assessment (EIA).

The Community Clinic construction project is categorized as an FI, according to the JICA Guidelines for Environmental and Social Considerations (April 2010), with which, an Environmental and Social Management System (ESMS) checklist is required. The contents of ESMS checklist has been confirmed as feasible and Line Director of Community-based Health Care (CBHC) OP, in charge of construction project of CC, will prepare ESMS performance reports for quarterly monitoring.

#### 8. Other Activities

To present the technology for imaging diagnosis and its utilization in Japan for the sub-project beyond HPNSDP 2011–2016, Strengthening Imaging Diagnostic System, the Medical Technology Exposure Visit in Japan was conducted November 15–20, 2014. The participants, headed by the Ministry of Health and Family Welfare, visited three related ministries of Japan, major manufacturers of medical equipment, and hospitals and universities, promoting a more comprehensive understanding of Japanese medical imaging technology.

In addition, technical workshop on medical equipment in Bangladesh was planned on 18 and 19, February 2015, to promote Japanese technology for stakeholders such as MOHFW, MCHs and medical institutions in Bangladesh. The major Japanese manufactures and doctors of hospital in Japan were supposed to participate in the workshop, however, it was cancelled due to unstable public security during that time in Bangladesh.

#### 9. Conclusion

Considering the current situation in health sector and selection criteria, the Survey Team concluded as follows.

##### 1) Sub-projects within HPNSDP 2011-2016

To improve MNCH coverage and contribute to UHC and gender-mainstreaming, continuing the current support by JICA

- Training of Community Support Group (CSG) under CBHC OP
- Training for FWVs on midwifery and Emergency Obstetric Care (EmOC) under MCRAH OP
- Distribution of Maternal and Child Health (MCH) kit and Family Welfare Centre (FWC) kit to Union Health and Family Welfare Centers (UHFWCs) under MCRAH OP
- New construction of CCs under CBHC OP and Physical Facility Development (PFD) OP

To improve the education environment of BSc nursing colleges coordinating with JICA's future technical cooperation for nursing education

- New construction of hostels under PFD OP and Nursing Education and Services (NES) OP



- Extension of academic buildings under PFD OP and NES OP
- Provision of equipment for skill laboratory under NES OP

To complete the up-gradation of DHs supported by JICA

- Provision of medical equipment under Hospital Service Management (HSM) OP

## 2) Sub-projects beyond HPNSDP 2011-2016

The Survey Team concluded that the establishment of imaging diagnostic centers at seven MCHs in each division is the most applicable to respond to increase of NCDs, to solve MCH's challenges, to contribute to UHC and gender-mainstreaming, and to utilize Japanese technology.

The sub-projects are;

- Provision of imaging diagnostic equipment at seven MCHs to replace expired equipment or to additionally install.
- New construction of imaging diagnostic center at seven MCHs to centralize installation of imaging diagnostic equipment in safe environment against radiation exposure
- Training to utilize imaging diagnostic equipment to enhance operational and diagnostic capacity of health professionals

Besides, further benefits are expected by introduction of Picture Archiving and Communication System (PACS) / Radiology Information System (RIS) as tertiary hospitals

- Introducing the PACS/RIS will help the hospital store patient records efficiently using minimal space. These data will help doctors compare pre- and post-treatment situations, and reduce the errors caused by incorrect storage of patient records.
- The accumulated data can be used for research and medical education by MCHs as teaching hospitals. In the future, there is the potential to undertake long-distance medical care by allowing hospitals to share their patients' data archives.

Both sub-projects within and beyond HPNSDP 2011-2016 are feasible, according to the survey results and analysis.

## 10. Recommendations

Since the sub-project within HPNSDP 2011-2016 will be implemented under OPs, the recommendations are for the sub-project beyond HPNSDP 2011-2016.

### (1) For smooth project implementation

It is recommended that MCHs prepare a time schedule for personnel recruitment that coincides with the timing of equipment installation for the following:

- Female radiology technologists/radiologists conversant with the operation of mammography equipment to make patients feel at ease during the examination
- IT engineers for the daily operation and maintenance of the PACS/RIS and/or the establishment of an IT section itself
- Receptionists for the imaging diagnostic center to register patients on the RIS

(2) For continued smooth management after project completion

- Introduce a self-study system for undergraduates and postgraduates using the imaging diagnostic centers
- Develop case studies using the imaging diagnostic data archives from pre-/post-treatment and follow-up treatment for conferences
- Standardize operator techniques for using specific medical equipment via periodic external audits
- Use imaging diagnostic data archives to enhance the quality and content of academic papers
- Develop technical training courses for DH staff using the imaging diagnostic centers
- Securing budget of additional operational cost such as water and power supply for building and equipment

(3) For effective and functional operations of imaging diagnostic centers

- In order to increase the operational rate of medical equipment and enhance the effectiveness of multidirectional examination, the imaging diagnostic equipment should be centralized in one location and specialized only for examination and diagnosis. In particular, the function of angiography equipment should be clearly demarcated between only radiological examination in imaging diagnostic center and diagnosis and treatment with surgical procedures in the main building of MCH, since operating theater, Intensive Care Unit (ICU) and supporting facilities such as central supply and sterilization units are already provided.
- Image diagnostic center should be utilized not only for diagnostics, but also education and practice for students and staff in order to familiarize themselves with modern technology and understand the importance of safe and clean environment.
- In order to increase the operation rate of medical equipment, proper staffing and budgeting should be arranged prior to the completion of construction of imaging diagnostic center at each MCH.

## **CHAPTER 1:**

### **Outline of the Preparatory Survey**



## **CHAPTER 1: Outline of the Preparatory Survey**

### **1.1 Background of the Survey**

The Ministry of Health and Family Welfare (hereinafter referred to as “MOHFW”) of the People’s Republic of Bangladesh (hereinafter referred to as “Bangladesh”) together with Development Partners (hereinafter referred to as “DPs”) developed the ‘Health, Population and Nutrition Sector Development Program’ (July 2011-June2016) (herein after referred to as “HPNSDP 2011 - 2016”) as a comprehensive development plan in the sector. HPNSDP 2011 - 2016 aims to ensure quality and equitable health care for all citizens in Bangladesh by improving access to and utilization of health, nutrition and population (HNP) services.

JICA has been supporting the effort of Government of Bangladesh (hereinafter referred to as “GOB”) especially in the areas of maternal, neonatal and child health and health system strengthening through a technical cooperation project, Safe Motherhood Promotion Project (hereinafter referred to as “SMPP”) Phase 1&2 and the Yen Loan Project Phase 1 (the Maternal, Neonatal and Child Health Improvement Project (Phase 1) (Health, Promotion and Nutrition Sector Development Program)). The Yen Loan Project Phase 1 (hereinafter referred to as “the Project”) is provided to meet the financial demand of the first three years of HPNSDP 2011 - 2016. Since the Project has been progressing almost as planned, the Preparatory Survey is necessary to examine the feasibility of the Project<sup>1</sup>.

The survey was conducted based on the Minutes of Meetings on “The Preparatory Survey on Maternal, Neonatal and Child Health Improvement Project (Phase2) (Health, Population and Nutrition Sector Development Program)” signed by MOHFW and JICA on January 19, 2014. This minute is attached to this report (See Annex 1).

### **1.2 Objectives of the Survey**

The objective of this Preparatory Survey is twofold: 1) to conduct an in-depth analysis on various issues related with the JICA loan project implementation such as the detailed plan, cost estimation, implementation and operation and maintenance structure, and environmental and social considerations, and 2) to propose the potential scope and scale

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<sup>1</sup> Minutes of Meeting on the preparatory survey agreed upon between GOB and JICA, January 19, 2014

for JICA's further financial assistance toward the last 15 months of HPNSDP 2011-2016 after the Yen Loan Project Phase 1 ends, and for beyond the HPNSDP 2011-2016.

The survey was conducted based on the basic policies below.

- (1) The Project will cover Maternal, Neonatal and Child Health and relevant issues in the period of HPNSDP 2011-2016 and beyond.
- (2) Expected modification of the HPNSDP 2011-2016 according to the planned midterm review in June 2014 will be taken into consideration and coordinated for the formulation of the Project.
- (3) Coordination and cooperation between the Project and other JICA projects should be examined.
- (4) Contribution for Universal Health Coverage (UHC) and a focus on mainstreaming of gender, which the Government of Japan considers as priorities, will be included in the Project.
- (5) Possibility of the utilization of Japanese technologies in the Project should be examined during the survey.
- (6) Consideration of the appropriate implementation structure for the Project is necessary for the smooth and efficient implementation of the Project.

### 1.3 Scope of the Survey

#### 1.3.1 Survey Area

The survey was conducted nationwide. Target facilities were indicated in the Project location map.

#### 1.3.2 Terms of Reference

The terms of reference of the survey is available in Annex 2.

#### 1.3.3 Survey Members

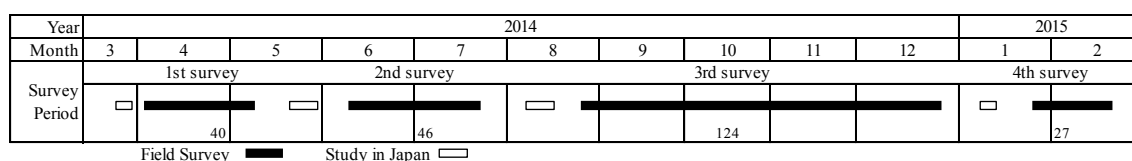
JICA dispatched a team consisting of the members in the list below.

In charge	Affiliation
Team Leader/ Health Services	C.D.C International Corporation
Deputy Leader/ Health Services	C.D.C International Corporation
Maternal, Neonatal and Child Health	C.D.C International Corporation
Operational Planning	Oriental Consultants Co., Ltd.
Human Resource for Health	C.D.C International Corporation
Hospital Service Management	C.D.C International Corporation
Medical Facility Planning 1	Oriental Consultants Co., Ltd.
Medical Facility Planning 2	Oriental Consultants Co., Ltd.

In charge	Affiliation
Medical Equipment	C.D.C International Corporation
Economic and Financial Analysis	C.D.C International Corporation
Environmental and Social Consideration	C.D.C International Corporation

#### 1.4 Survey Schedule

The total survey period is 12 months, from March 2014 to February 2015. The survey period was divided into 4 parts as shown in the figure below. More detailed schedule is shown in Annex 3.



#### 1.5 Methodology of the Survey

The survey targeted primary, secondary, and tertiary health facilities and governmental agencies working in the areas of health, public works, and environmental issues.

##### 1.5.1 Main Survey Items and Methodology

Survey Period (Japan/Bangladesh)	Main Survey Items	Survey Methodology
Japan	<ul style="list-style-type: none"> <li>to study the background and necessity of the Project</li> </ul>	Document review
1 <sup>st</sup> Field Survey	<ul style="list-style-type: none"> <li>to review the progress/achievement of MDGs, OPs and MNCH services from 4 different perspectives such as; health system, human resources (training), facilities and equipment</li> <li>to review the operation and maintenance of health facilities and equipment from primary to tertiary levels</li> <li>to identify the needs (gap), challenges/impeding factors, available local resources and opportunities</li> <li>to collect the relevant data and information about them</li> </ul>	Site visits (all of 7 divisions) Interview survey Data collection
Japan	<ul style="list-style-type: none"> <li>to analyse the compiled data and information</li> <li>to formulate Interim Report 1</li> </ul>	
2 <sup>nd</sup> Field Survey	<ul style="list-style-type: none"> <li>to develop a hypothetical project framework for the Yen Loan Project Phase 2</li> <li>to assess feasibility of the hypothesis in terms of policy (Bangladesh and Japan), OPs, local resources (human, physical, financial), local needs, environmental and social aspects</li> <li>to assess the capacity of the stakeholders in executing the Project, including operation and maintenance</li> </ul>	Site visits Discussion with MOHFW Interview survey Data collection



Survey Period (Japan/Bangladesh)	Main Survey Items	Survey Methodology
Japan	<ul style="list-style-type: none"> <li>to analyse the compiled data and information</li> <li>to formulate Interim Report 2</li> </ul>	
3 <sup>rd</sup> Field Survey (1)(2)	<ul style="list-style-type: none"> <li>to develop indicators to evaluate the Project</li> <li>to estimate total project costs: facility, equipment, training and consulting services</li> <li>to prepare the ESMS</li> <li>to compile data for financial and economic evaluation</li> </ul>	Site visits Interview survey Data collection
Japan	<ul style="list-style-type: none"> <li>to formulate Draft Final Report</li> <li>to conduct medical technology exposure visit in Japan</li> <li>to prepare the technical workshop on medical equipment in Bangladesh</li> </ul>	
4 <sup>th</sup> Field Survey	<ul style="list-style-type: none"> <li>to explain the proposal on Project to Bangladesh side</li> <li>to receive comments on it from Bangladesh counterpart</li> </ul>	Presentation Workshop
Japan	<ul style="list-style-type: none"> <li>to revise the Draft Final Report</li> <li>to formulate Final Report</li> </ul>	

### 1.5.2 Target Setting

After data collection by a prior bibliographic survey, the Survey Team roughly set the targets of the survey based on its basic objectives (see 1.2 on Objectives of the survey) and after considering factors affecting its efficient implementation within the given period. The criteria used for target selection were as follows:

- Sites related to MNCH (Maternal, Neonatal and Child Health) services and the health system
- Sites related to the OPs in HPNSDP 2011-2016 and supported by the Government of Japan
- Sites related to Japan's support in the past, present, and future
- Sites that have accepted and utilized Japanese technology
- Sites earmarked for UHC contributions

The facilities that fulfilled two or three of the abovementioned criteria were selected as the targets. They included the main MCHs in each division and the national medical university, which are the top referral hospitals utilizing advanced technology; tertiary hospitals specializing in MNCH services; some secondary hospitals; some primary health facilities, and nursing colleges to ensure future technical cooperation. Tertiary private hospitals were also selected as targets in order to grasp the situation and service level prevailing in the private sector.

In order to confirm the progress made by HPNSDP 2011-2016, the Survey Team visited

the Line Directors of the OPs related to the Project. The Survey Team also visited administrative departments under MOHFW to study the protocols and procedures for project implementation and management.

In the early period of the first field survey, the Survey Team assumed that the survey objectives beyond HPNSDP 2011-2016 would be well served by strengthening MCHs' diagnostic capacity (i.e., as sub-projects). The first impression after observing MCHs was that even tertiary hospitals were struggling to provide adequate health services with overcrowding of patients because they do not refuse any patients. Also, the major causes of deaths in Bangladesh, that is, non-communicable diseases and injury, can be reduced by early detection and correct diagnosis using imaging diagnostic services. Based on this hypothesis, the survey focused on diagnostic services, especially radiology and imaging, at MCHs.

A list of organizations visited by the Survey Team during the survey period is available below.

Table 1-1: List of Visited Organizations

Category	Subcategory	Visiting Institution/Organization	Division
Health Facilities	Tertiary Hospital	Chittagong Medical College Hospital	Chittagong
		Dhaka Medical College Hospital	Dhaka
		Khulna Medical College Hospital	Khulna
		Mymensingh Medical College Hospital	Dhaka
		MAG Osmani Medical College Hospital	Sylhet
		Rajshahi Medical College Hospital	Rajshahi
		Rangpur Medical College Hospital	Rangpur
		Sher-e-Bangla Medical College Hospital	Barisal
		Bangabandhu Sheikh Mujib Medical University (BSMMU)	Dhaka
		Kurmitola General Hospital (Army Hospital)	Dhaka
		Dhaka Shishu Hospital (Children Hospital)	Dhaka
	Secondary Hospital	Narsingdi District Hospital	Narsingdi
		Chittagong General Hospital	Chittagong
		Sylhet District Hospital (Shahid Shamsuddin District Hospital)	Sylhet
		Manikganj District Hospital	Dhaka
		Gazipur District Hospital	Dhaka
	Primary facilities	Paba Upazila Health Complex	Rajshahi
		Ghee Para Community Clinic (CC)	Rajshahi
	Institute	MCHTI (Maternal & Child Health Training Institute)	Dhaka
		ICMH (Institute of Child and Mother Health)	Dhaka
		IHT (Institute of Health Technology)	
	Private	Apolo Hospital	Dhaka
		United Hospital	Dhaka
Nursing Colleges (BSc)	MOHFW	College of Nursing, Chittagong Medical College	Chittagong
		College of Nursing, Dhaka Medical College	Dhaka
		College of Nursing, Mymensingh Medical College	Dhaka
		College of Nursing, Rajshahi Medical College	Rajshahi
		College of Nursing, Rangpur Medical College	Rangpur
		College of Nursing, MAG Osmani Medical College	Sylhet
		College of Nursing, Sher-e-Bangla Medical College	Barisal
	Government sector	Faculty of Nursing, BSMMU	Dhaka

Category	Subcategory	Visiting Institution/Organization	Division
Nursing Colleges (Post-basic BSc)	MOHFW	College of Nursing, Mohakali	Dhaka
Government Agency	MOHFW	PW (Planning Wing)	Dhaka
		PFD OP	Dhaka
		FMAU	Dhaka
		PMMU	Dhaka
		HED	Dhaka
		HRM OP	Dhaka
		NEMEW	Dhaka
	DGHS	MIS OP	Dhaka
		CMSD	Dhaka
		HSM OP	Dhaka
		MNCAH OP	Dhaka
		CBHC OP	Dhaka
		ESD OP	Dhaka
	DGFP	MCRAH OP	Dhaka
	Other	NES OP, DNS	Dhaka
		SDAM OP, DGDA	Dhaka
	CS	Narsingdi Civil Surgeon Office	Narsingdi
		Sylhet Civil Surgeon Office	Sylhet
		Rajshahi Civil Surgeon Office	Rajshahi
	MOHPW	DOA (Department of Architecture)	Dhaka
		PWD (Public Work Department)	Dhaka
	MOEF	Department of Environment	Dhaka
Development Partner	-	UNICEF	Dhaka
		Korea International Cooperation Agency (KOICA)	Dhaka
		Management Science for Health (MSH)	Dhaka



## **CHAPTER 2:**

### **Health Situation in Bangladesh**





## CHAPTER 2: Health Situation in Bangladesh

### 2.1 Socioeconomic Situation in Bangladesh

#### 2.1.1 General Information

Bangladesh, a country in South Asia, shares a border with India and Myanmar. Bangladesh is one of the most densely-populated countries in the world, with an estimated population of about 139.3 million<sup>1</sup> as of 2011 within a total land area of 147,570 square kilometers. The majority (approx. 89%) of the population is Muslim. Bangladesh emerged as an independent nation in 1971 before which it was a province of Pakistan, and it is a member of the Commonwealth of Nations.

Despite a declining trend, the agrarian sector dominates the country's economy, accounting for the majority of the rural labor force. The principal industries of the country include readymade garments, textiles, chemical fertilizers, pharmaceuticals, tea-processing, sugar, and leather goods. The principal minerals include natural gas, coal, white clay, and glass-sand. Bangladesh has been utilizing a mixed system of public and private development, which operates on free-market principles. The GDP growth rate is 6.3% (World Bank 2012). The per-capita income is estimated for the fiscal year 2012-2013 at 1,044USD taking the fiscal year 2005-2006 as the base year (BBS 2013)<sup>2</sup>.

#### 2.1.2 Health Expenditure

The Bangladesh National Health Accounts 1997-2007 was officially published in 2010 by the Health Economics Unit (HEU) of the MOHFW. The latest data for the updated NHA is being collected and analyzed. The Total Health Expenditure (THE) and its share by different contributors in Bangladesh are shown in the table below<sup>3</sup>.

Table 2-1: Total Health Expenditure (THE) and its Share by Different Contributors in Bangladesh (2006-2007)

Public Sector		Household		Private		Insurance		NGO		Development partners		Total THE
Mil. Taka	% of THE	Mil. Taka	% of THE	Mil. Taka	% of THE	Mil. Taka	% of THE	Mil. Taka	% of THE	Mil. Taka	% of THE	Mil. Taka
41,318	26%	103,459	64%	1,325	1%	314	0%	2,092	1%	12,391	8%	160,899

Source: Health Bulletin 2013

<sup>1</sup> Socio-economic and Demographic Report, National Report Volume -4, Bangladesh Population and Housing Census 2011, Bangladesh Bureau of Statistics (BBS), 2012

<sup>2</sup> Health Bulletin 2013, MOHFW, 2014.

<sup>3</sup> Health Bulletin 2013, MOHFW, 2014.

For Bangladesh, THE has continuously increased during 1997 to 2007, from 74.4 billion Taka in 1997 to 160.9 billion Taka in 2007, when measured in constant 2007 prices. Over the 1998–2007 periods the average annual THE growth rate was 12.7% in nominal terms and 8.1% in real terms. The ratio of Bangladesh’s health expenditure to Gross Domestic Product (GDP) provides an indication of the proportion of overall economic activity contributed by the health sector. THE accounted for 3.4% of GDP in 2007. Health expenditures in relation to GDP shows a slow but steady increase over time – averaging 2.8% during the 1998–2002 period compared to an average of 3.2% during the period of 2003–2007. It can say that health expenditure maximum 3.4% is a still small amount comparing other countries. In 2007, per capita spending on health was 1,118Taka (16.2USD) compared to 988 Taka (14.7USD) the preceding year (See Figure 2-1, 2-2 and 2-3 below) <sup>4</sup>.

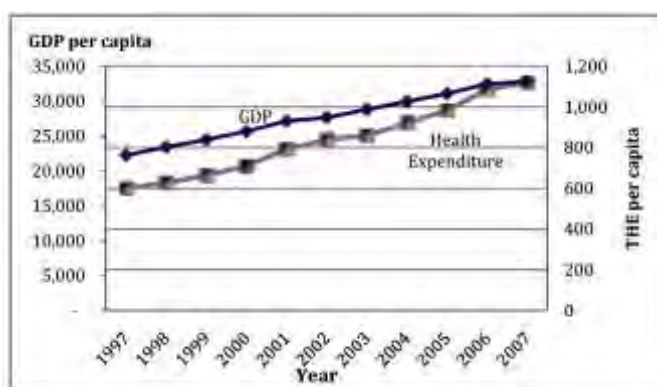


Figure 2-1: Per Capita Health Expenditure and per Capita GDP (Taka), 1997-2007

Source: Bangladesh National Health Accounts (BNHA-III) 1997-2007

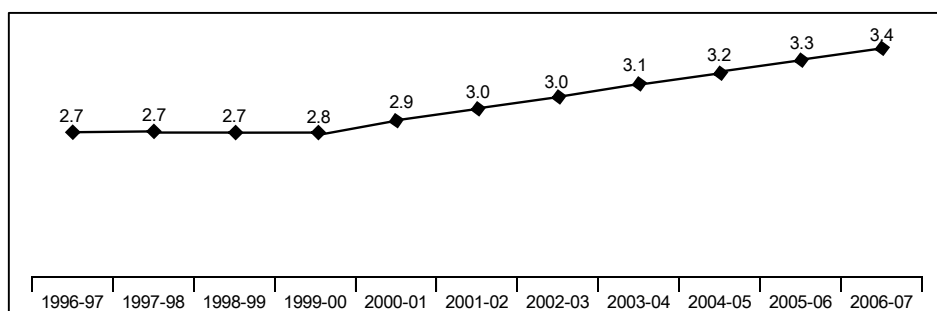


Figure 2-2: Ratio of Total Health Expenditure Each Year as Percentage of GDP (1997-2007)

Source: Health Bulletin 2012

<sup>4</sup> Bangladesh National Health Accounts (BNHA-III) 1997-2007

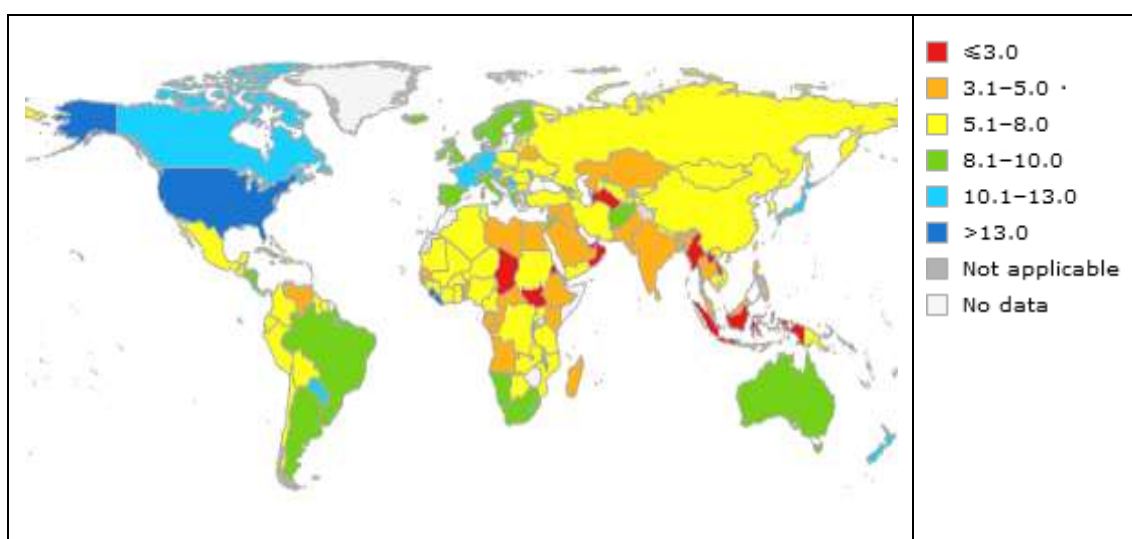


Figure 2-3: THE as a Percentage of GDP (weighted, measured in USD) in the World

Source: [http://gamapserver.who.int/gho/interactive\\_charts/health\\_financing/atlas.html](http://gamapserver.who.int/gho/interactive_charts/health_financing/atlas.html), WHO

## 2.2 Trends in Health Indicators in Bangladesh

### 2.2.1 Health Indicators of the Health-related MDGs

Bangladesh is making good progress in almost all of the health-related MDGs. As the table below shows, the child mortality rates and the indicators of communicable diseases are improving and some are already attained the targets, however, maternal health service coverage is lower than in neighboring countries and will require more attention.

Table 2-2: Indicators of the Health-related MDGs in Bangladesh

MDG	Indicator	Benchmark (Year)	Current (Reference)	South Asia Region average	Target (Year)
1	Prevalence of underweight among children <5 years of age (%)	66.0 (1990)	36.4 (BDHS 2011)	27.6	33.0 (2015)
4	Under 5 mortality rate / 1,000 live births	144.0 (1990)	53.0 (BDHS 2011)	55	48.0 (2015)
4	Infant mortality rate/ 1,000 live births	94.0 (1990)	43.0 (BDHS 2011)	42	31.3 (2015)
4	1-year old children immunized against measles (%)	52.0 (1991)	87.5 (BDHS 2011)	79	100 (2015)
5	Maternal mortality ratio/ 100,000 live births	574.0 (1990)	194.0 (BMMS 2010)	200	143.5 (2015)
5	Births attended by skilled health personnel (%)	7.0 (1990)	31.7 (BDHS 2011)	59	50.0 (2015)
5	Contraceptive prevalence rate (%)	39.9 (1991)	61.2 (BDHS 2011)	59	72.0 (2016)
5	Birth rate among adolescent mothers/ 1,000 women	77.0 (1990/91)	118.3 (BDHS 2011)	49	-
5	Antenatal care coverage (at least one visit) (%)	27.5 (1993)	54.6 (BDHS 2011)	76	100.0 (2015)
5	Unmet need for family planning (%)	19.4 (1993)	13.5 (BDHS 2011)	14	7.6 (2016)
6	HIV prevalence among population aged 15-24 years (%)	0.005 (1990)	0.7 (NASP 2011)	189	Halt (2015)

MDG	Indicator	Benchmark (Year)	Current (Reference)	South Asia Region average	Target (Year)
6	Malaria death rate/ 100,000 pop.	0.106 (2008)	0.007 (DGHS 2012)	2.4	0.053 (2015)
6	TB prevalence rate/ 100,000 pop.	639.0 (1990)	411.0 (DGHS 2011)	271	320.0 (2015)
6	New smear +ve TB case detection rate under DOTS (%)	21.0 (1994)	70.0 (NTP 2012)	62	>70.0 (2015)
6	TB cure rate (%) with DOTS	73 (1994)	92.0 (NTP 2012)	88	>85.0 (2015)

Source: Health Bulletin 2013 for Benchmark, Current and Target. World Health Statistics 2013 for South-East Asian Region Office (SEARO) average

### 2.2.2 Mortality Profile

Data from the Bangladesh Demographic and Health Survey 2011 (hereinafter referred to as “BDHS 2011”) shows that under-five mortality in the five years preceding the survey (which corresponds closest to the calendar years 2007-2011) is 53 per 1,000 live births. The infant mortality rate is 43 per 1,000 live births and the neonatal mortality rate is 32 per 1,000 children. It is also notable that deaths in the neonatal period account for 60 percent of all under-five deaths. Between the 1989-1993 and 2007-2011 periods, infant mortality declined by half from 87 deaths per 1,000 live births to 43 deaths per 1,000 live births. Even more impressive is the 60 percent decline in under-five mortality over the same period.

According to the “Bangladesh Maternal Mortality and Health Care Survey 2010” (hereinafter referred to as “BMMS 2010”), the Maternal Mortality Ratio (MMR) declined significantly by around 40% from 322 to 194 between BMMS 2001 to BMMS 2010. Fertility in Bangladesh has been declining since the 1970s. The Total Fertility Rate declined from 6.3 births per woman in 1971-75 to 2.3 births per woman in 2009-2011<sup>5</sup>.

Major shifts in cause of death have occurred because of these reductions in mortality and the birth rate. Similar to many countries that have had epidemiological and demographical transitions, Bangladesh has had a decline in infectious diseases and a rapid increase of non-communicable chronic diseases (NCD) (See Figure 2-4)<sup>6</sup>. The data collected for more than 40 years in Matlab, a rural subdistrict (upazila) with a population of around 222,000, shows the shift from communicable disease to NCD-related mortality during 1986–2006 based on the assessment of causes of 18,917 deaths obtained through verbal autopsies.

<sup>5</sup> Bangladesh Demographic and Health Survey 2011, National Institute of Population Research and Training (NIPORT), 2012.

<sup>6</sup> Bangladesh: Innovation for Universal Health Coverage, The LANCET, 2013.

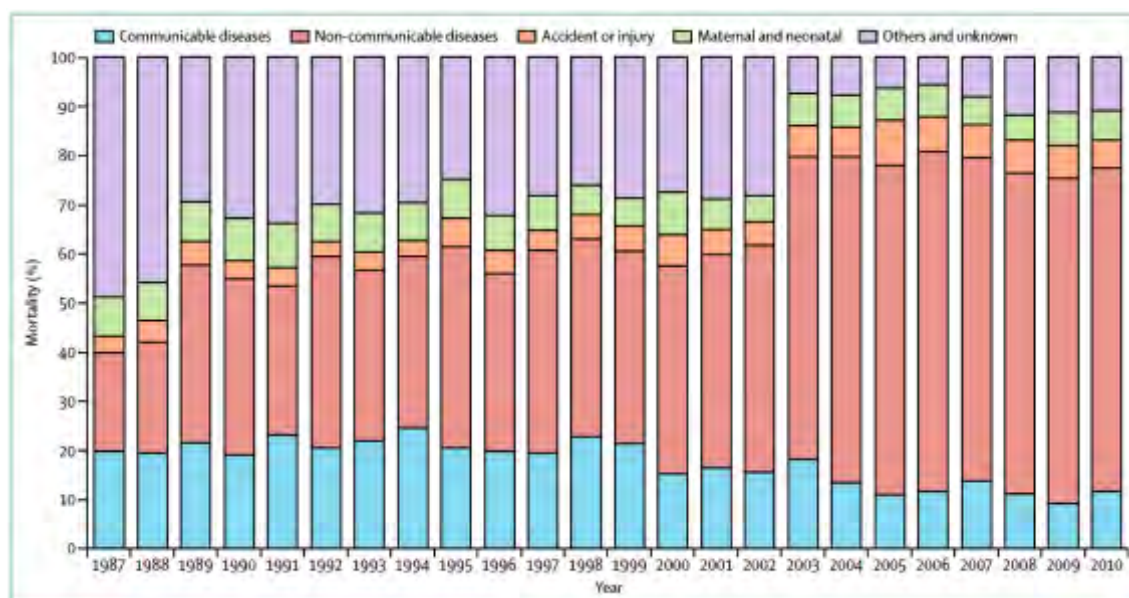


Figure 2-4: All-ages of Causes of Deaths in Matlab, Bangladesh (1987 – 2010)

Source: The Bangladesh paradox: exceptional health achievement despite economic poverty, 2013.

## 2.3 Current Situation of Maternal and Child Health in Bangladesh

### 2.3.1 Mortality

According to the percentage of death cases reported from different institutions in Bangladesh to Directorate General for Health Services (hereinafter referred to as “DGHS”) <sup>7</sup>, perinatal causes still remain as one of major killers (See Table 2-3). Hemorrhage and eclampsia account for a half of the maternal deaths <sup>8</sup>, which can be reduced by appropriate treatment.

Table 2-3: Percentage of Death Cases Reported from Different Institutions in Bangladesh

Rank	Affected body-system/ Disease category	%
1	Disease of cardiovascular system	23.85
2	Disease of respiratory system	15.24
3	Perinatal cause	9.67
4	Infective condition	8.54
5	Cerebrovascular condition	6.41
6	Injury (excluding drowning)	6.3
7	Poisoning	4.87
8	Disease of nervous system	4.75
9	Diabetes mellitus and HTN complication	3.16
10	Hepatic disease	2.46

Source: Health Bulletin 2012, MOHFW

<sup>7</sup> DGHS received 49,225 death reports from 451 government health facilities in 2011. Among 49,225 reported cases, around 9,444 cases were not properly, which were excluded during analysis.

<sup>8</sup> Bangladesh Maternal Mortality and Health Care Survey 2010. Dhaka, Bangladesh: NIPORT, MEASURE Evaluation, and ICDDR.

The percentage of under-five mortality is 24% of all death cases analyzed. The percentage of child mortality is 15% for neonates and 21% for infants. Table 2-4 shows that pneumonia is the top killer disease and preterm birth complications are the second highest causes of death, including preterm low bodyweight, neonatal jaundice, and febrile convulsion<sup>9 10</sup>.

Table 2-4: Cause of Death in Under-Five Children (2011)

Disease	0-1 month	2-11 months	1-4 year(s)	Total
Pneumonia	818	1313	321	2452
Preterm birth complication	2170	99	0	2269
Neonatal sepsis	1332	0	0	1332
Birth asphyxia	843	0	0	843
Septicemia	0	465	90	555
Meningitis/ Encephalitis	92	182	181	455
Injury	123	49	101	273
Malnutrition	18	106	48	172
Gastrointestinal complication	69	29	22	120
Diarrheal disease	8	66	39	113
Congenital disease	34	39	24	97
Infective condition	16	29	37	82
Non-communicable disease	0	33	35	68
Severe malaria	7	3	16	26
Birth trauma	23	0	0	23
Neonatal tetanus	16	0	0	16
Grand total	5569	2413	914	8896
Percentage	63%	27%	10%	100%

Source: Health Bulletin 2012, MOHFW

### 2.3.2 MNCH Service Indicators

The utilization of maternal health services such as antenatal care (ANC), delivery attended by a medically trained provider and postnatal care (PNC) has been increasing since 2004. The percentage of ANC at least 4 visits has increased from 17% in 2004 to 26% in 2011. The percentage of delivery attended by a medically trained provider has increased double from 16% in 2004 to 32% in 2011<sup>11</sup>.

The MMR and indicators of maternal health and family planning service coverage by division are shown on the table below. While Khulna division achieved the lowest MMR among the 7 divisions with high service coverage, high MMR with low service coverage significantly remains in Sylhet division (See Table 2-5). It seems that Sylhet division requires more interventions to deliver the maternal health services.

<sup>9</sup> Health Bulletin 2012, MOHFW, 2012.

<sup>10</sup> All the health organizations reported 10,389 death cases under age of five. Among those cases, 8,896 were analyzed in this health bulletin.

<sup>11</sup> Bangladesh Demographic and Health Survey 2011, National Institute of Population Research and Training (NIPORT), 2012.

Table 2-5: MMR and Indicators of Maternal Health and Family Planning Service Coverage by Division

Division	MMR (/100,000 live births)	Receiving ANC from a skilled provider (%)	Delivered by a medically trained provider (%)	Delivered in health facility (%)	Delivered by C-section (%)	Any contraceptive method used (%)	Unmet need for FP (%)
Barisal	168	50.8	28.4	22.3	13.2	64.7	10.0
Chittagong	186	55.1	29.7	24.8	14.0	51.4	19.0
Dhaka	196	54.5	31.5	29.9	20.2	61.0	11.2
Khulna	64	65.4	49.0	45.8	26.2	66.7	8.3
Rajshahi	173	56.1	30.9	29.8	17.6	67.3	8.8
Rangpur	N/A	49.6	28.7	27.6	11.6	69.4	8.3
Sylhet	425	46.7	24.4	21.0	12.0	44.8	15.5
National	194	54.6	31.7	28.8	17.1	61.2	11.7

Source: BMMS2010 for MMR, BDHS2011 for other indicators

### 2.3.3 Development Partners for Maternal and Child Health

According to the “Maternal, Neonatal and Child Health (MNCH) Mapping Study 2011”, there were 25 MNCH projects as of 2011 and 8 of the 25 projects were closed by the time of this survey in 2014. There are 6 projects ongoing in parallel with HPNSDP to support MNCH services in Bangladesh especially mainly providing ANC, PNC, EPI and Family Planning for district and primary level (See Table 2-6). The MNCH Mapping is being updated at present.

Table 2-6: Summary of the Projects in Parallel with HPNSDP

Project/NGO	Source of funding	Major activities	Coverage	Duration
Rangpur Dinajpur Rural Services (RDRS)	NA	Provision of ANC and PNC services, Safe delivery care from one RDRS clinic and so on	8 north-western districts of Rangpur division	Ongoing (continuous)
Ipas Bangladesh	DFID, EC, Netherland, other hidden donors	Utilization of quality Menstrual Regulation and Post Abortion Care services and so on	90 public sector facilities including MCHs, DHs, UHCs and FWCs	2011-2016
Marie Stopes Clinic, Bangladesh	ADB, USAID, UNAIDS, GFATM	Family Planning, HIV/STIs and so on	62 districts through 144 clinics	Since 1988 ongoing
Matlab MNCH	DFID, Core (ICDDR)	High quality BEmOC, Blood transfusion, Referrals to CEmOC facilities and so on	ICDDR service area in Matlab	Since 2007 ongoing
LAMB Hospital, Parbotipur	DFID, Friends of LAMB, Australia, USA	CEmOC services through LAMB hospital and community level services and so on	21 rural unions of Dinajpur and Nilphamary district 22 unions and 1 municipality Parbotipur	Since 1983
Gonoshysta Kendra, Savar	Several Donors	Full preventive health care incl. EPI, Family Planning and so on	3 unions in Savar, 3 unions in Dhamrai, 1 union in Saturia and 2 unions in Gazipur	Since 1972 ongoing

Source: Maternal, Neonatal and Child Health (MNCH) Mapping Study 2011, Anwar I. and Islam N.

## 2.4 Situation of Non-communicable Diseases (NCDs)

### 2.4.1 Burden of NCDs

As shown in Figure 2-4 in Chapter 2.2.2, non-communicable diseases (NCDs) in Bangladesh occupy a major share of the disease burden and mortality.

The national NCD risk factor survey (2010) revealed the following critical facts: (1) NCDs may account for 61% of the country's total disease burden; (2) among the sampled adult population (15+ years), 97% had at least one risk factor, half of whom had two risk factors; (3) the country has 40 million adult smokers and smokeless tobacco-users; (4) 64.5 million people are not taking adequate amount of fruits and vegetables; (5) 17 million people are not doing adequate physical activity; (6) 18% of adults have hypertension; (7) 4% have self-reported documented cases of diabetes. Injury is also a major cause of death in Bangladesh. The mortality rates due to injury across all age groups were 37.4 and 43.6 per 100,000 people in 2011 and 2012, respectively<sup>12</sup>. As shown in the table below, NCDs including injury account for the most frequent causes for admission to MCHs in 2011 and 2012.

Table 2-7: Top 10 Diseases/Causes for Admission to Medical Hospitals in 2011 and 2012

Diseases/Cause of admission	2012*		2011**	
	Ranking	%	Ranking	%
Road traffic accident	1	6.31	2	5.58
Assault	2	4.92	1	5.90
Myocardial infarction	3	2.82	N/A	N/A
Cerebrovascular accident (CVA)	4	2.59	5	2.31
Poisoning	5	2.05	7	1.98
Hypertension	6	2.02	9	1.88
Fracture	7	1.95	4	2.64
Pneumonia	8	1.89	6	2.14
Diabetes mellitus	9	1.68	10	1.70
Diarrhea	10	1.65	3	2.82

\*2012: Number of patients: 226,476; Number of hospitals: 6, \*\*2011: Number of patients: 407,437; Number of hospitals: 10

Source: Health Bulletin 2013

### 2.4.2 Strategic Plan for NCDs

The wide variety of NCDs in Bangladesh continues to increase the disease burden on the country.<sup>13</sup> DGHS, MOHFW developed “Strategic Plan for Surveillance and Prevention of Non Communicable Diseases in Bangladesh 2011–2015” in 2011, which updated the previous national strategic plan of 2007–2010. The goal of the new plan is to reverse the increasing

<sup>12</sup> Health Bulletin 2013, Directorate General of Health Services (DGHS), Ministry of Health and Family Welfare (MOHFW)

<sup>13</sup> Health Bulletin 2013, DGHS, MOHFW



number of NCD deaths and reduce it by 2% per annum.

The strategic plan of action for NCDs utilizes a comprehensive approach that simultaneously seeks to affect change at three levels:

- (1) At the environmental level, through policy and regulatory interventions
- (2) At the level of common and intermediate risk factors, through population-based lifestyle interventions
- (3) At the level of early and established disease, through clinical interventions targeted at the entire population (screening), high-risk individuals (risk factor modification) and persons with established disease (clinical management)<sup>14</sup>

#### 2.4.3 OP for NCD in HPNSDP 2011-2016

The name of OP for NCD is “Non Communicable Disease Control (NCDC)” under DGHS.

##### (1) General objective:

To reduce mortality and morbidity caused by NCDs through strengthening health service delivery in the management and referral for NCDs, promoting healthy lifestyle and practices and developing an effective public health surveillance system.

##### (2) Major components

The major issues relating to NCD is described in the table below.

Table 2-8: Major Components of NCDC OP

No.	Major Components
1	Conventional NCD including Major NCDs: Cardio Vascular Diseases (CVD), Perinatal Vascular Disease (PVD), Cerebral Vascular Diseases (Stroke), Cancer, Diabetes, Chronic Obstructive Pulmonary diseases (COPD), Arsenicosis, Renal Diseases, Deafness, Osteoporosis, Congenital Anomalies, Oral Health, Thalassemia
2	Non Conventional NCD: Road Safety and other Traffic Injuries Prevention, Child Injury including Drowning, Sports Injury, Snake bite and Suicidal Injury, Violence against Women (VAW) including Acid Burn
3	Occupational Health and Safety (Industrial and Agriculture) and Strengthening to Institute of Public Health (PH)
4	Climate Change, Air Pollution, Water Sanitation and Other Environmental Health Issues
5	Emergency Preparedness and Response (EPR), Post Disaster Health Management and Emergency Medical Services (EMS)
6	Mental Health, Autism, Tobacco, Alcohol and Substance Abuse

Source: NCDC OP document, 2011

<sup>14</sup> Strategic Plan for Surveillance and Prevention of Non Communicable Diseases in Bangladesh 2011-2015, DGHS, MOHFW

### (3) Priority activities of the OP

The NCDC OP consists of six priority programs. The priority activities under the programs are as follows:

- 1) Development, formulation and up-gradation of National Strategic Papers
- 2) Capacity Building of Health Service Providers and relevant stakeholders through orientation and training
- 3) Preparation of training module
- 4) Mass awareness raising activities
- 5) Piloting, model demonstration and scale up
- 6) Strengthening Surveillance System and Management Information System
- 7) Supporting institutional development
- 8) Operational Research and Survey
- 9) Coordination and Partnership

#### 2.4.4 DPs' Support for NCDs

According to the Strategic Plan the above mentioned in 2.4.2, there are some partners supporting for the strategy.

##### (1) Private Public Partnership (PPP) / Non-governmental Organizations (NGO)

The partner PPP/NGOs organizations of BanNET will be involved in the process of disease surveillance, prevention and control of NCDs. The non-profit health foundations, organizations and institutions will collect data from hospitals and also from community through periodic surveys and research studies to contribute to the surveillance system. NGOs will identify media to disseminate the network activities to create awareness among people.

##### (2) World Health Organization (WHO)

In a view to develop an effective surveillance and prevention mechanism for NCD in the country, WHO will provide strategic support and technical assistance, develop and test standardized methods and tools, prepare evidence-based guidelines and operating manuals, support development and improvement of human resource capacity, liaise BanNET with other national and regional networks and mobilize resources.

##### (3) United Nations Population Fund (UNFPA)

UNFPA will support for cervical cancers screening program based on Visual Inspection by Acetic Acid (VIA) method, promote breast cancer screening by promoting breast self-examination and promote cervical and breast cancer registry in the community.

(4) Other DPs

NCDs have already been identified and considered as the health sector priorities. Therefore international funding agencies such as World Bank, JICA, Asian Development Bank, DFID may show their interest to invest in this sector.



## **CHAPTER 3:**

### **Health System in Bangladesh**



## CHAPTER 3: Health System in Bangladesh

### 3.1 Healthcare Network

The MOHFW is the lead agency responsible for formulating national-level policy, planning, and decision making in the provision of healthcare services. The national-level policies, plans and decisions are translated into actions by various implementing authorities and healthcare delivery systems across the country from the national to the community level. The MOHFW and its relevant regulatory bodies also have indirect control over the healthcare system of the NGOs and the private sector<sup>1</sup>.

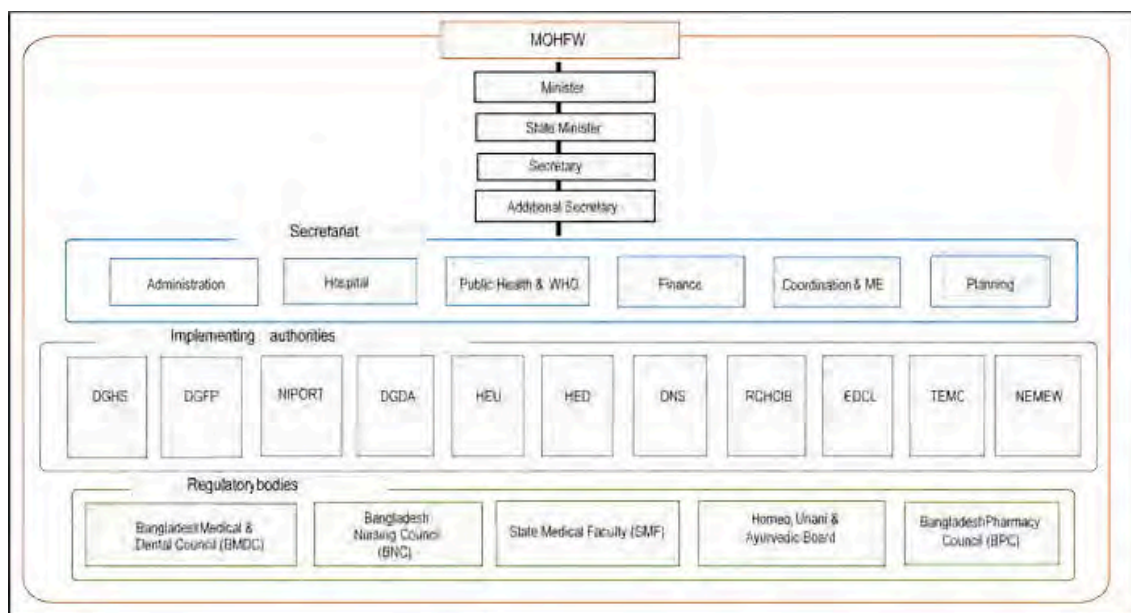


Figure 3-1: Organogram of MOHFW

Source: Health Bulletin 2013

The healthcare infrastructure under the DGHS is comprised of six tiers: national, divisional, district, upazila (sub-district), union, and ward. Besides, the maternal child health services are provided by the MCH service centers under the Directorate General of Family Planning (hereinafter referred to as “DGFP”) as well. The both infrastructures are shown in the table below.

<sup>1</sup> Health Bulletin 2013, MOHFW, 2014.

Table 3-1: Health Infrastructure under DGHS and DGFP

Level	DGHS		DGFP	
Tertiary healthcare	National	7 Specialized Hospitals affiliated with postgraduate teaching institute	Maternal and Child Health Training Institute (MCHTI)	National
		5 Specialized Centers/Hospitals		
	Regions (7)	22 Medical College Hospitals	Mohammadpur Fertility Services and Training Center (MFSTC)	
Secondary healthcare	Districts (64)	53 District Hospitals	60 Mother and Child Welfare Centers (MCWC)	District
		11 General Hospitals		
		13 Chest disease / TB Hospitals		
		5 Infectious Disease Hospitals		
		3 Leprosy Hospitals		
		6 Others Hospitals		
Primary healthcare	Upazillas (Sub-districts) (492)	436 Upazila-level hospitals	247 MCH-FP unit of Upazila Health Complexes (UHC)	Upazila Level
			12 Mother and Child Welfare Centers (MCWC)	
	Unions (4,501)	31 Union-level Hospitals	24 Mother and Child Welfare Centers	Union Level
		1275 Union subcenters	3827 Union Health and Family Welfare Centers (UH&FWC)	
		87 Union health and family welfare centers		
	Wards (45,509)	12,527 Community Clinics (based on Health Bulletin 2013)		Community Level
	Villages (87,310)			

Source: Health Bulletin 2012 and 2013, MOHFW

Remarks: DGFP mentions the number of CC as 10,723 on their website <http://dgfpmis.org/menumch.htm>

### 3.2 Policies and Strategies for Health of the Government of Bangladesh

In spite of past progress in poverty reduction, the GOB recognizes that Bangladesh is still a low income developing country. The poor people in Bangladesh is severely disadvantaged in terms of ownership of assets and has inadequate access to institutional finance as well as to basic services including quality education, healthcare, water and sanitation. Vision 2021 aspires for Bangladesh to attain a Middle Income Country (MIC) status by FY2021. In recognition of these substantial development challenges, the GOB has recently embarked on a Perspective Plan covering 2010 to 2021 aimed at implementing Vision 2021. This broad framework leaves considerable latitude for the Sixth Five Year Plan (FY2011-2015) and the Seventh Five Year Plan (FY2016-2020) to work out operational details of how the country should move forward. A number of core targets have been identified to monitor the progress of the Sixth Plan. These targets have been set according to the vision and objectives of the perspective plan as well as the goals of the Millennium Development Goals. These verifiable targets fall in seven broad categories: (i) Income and Poverty; (ii) Human Resource Development (iii) Water and Sanitation; (iv) Energy and Infrastructure, (v) Gender Equality and Empowerment; (vi) Environmental Sustainability; and (vii) Information and Communication Technology (ICT) (Sixth Five Year Plan (FY2011-2015)). The targets for improving the maternal, neonatal and child health issues are included in (ii) Human Resource Development, and it is the most



important issue in the national poverty reduction strategy.

Regarding the above mentioned national health development plan, the MOHFW issued “National Health Policy 2011”. Several health strategies such as the “National Strategy for Maternal Health 2001” and the “National Neonatal Health Strategy and Guidelines 2009” are also strategies for achieving the goals of these national policies.

MOHFW has been implementing a sector wide approach (SWAp) since July 1998 focusing on pro-poor essential service packages, which aim at reducing the gap between the rich and the poor. The first SWAp – the Health and Population Sector Program (HPSP) 1998-2003 focusing on basic services for the poor through an Essential Service Package, was followed by a second SWAp - the Health, Nutrition and Population Sector Program (HNPSPP) 2003-2011 focusing on accelerating the achievement of health related MDGs and PRSP goals through service delivery. The third SWAp – the Health, Population and Nutrition Sector Development Program (HPNSDP) – began in July 2011 for a period of 5 years through to June 2016. Its articulation and implementation are actively linked to the government’s Sixth Five Year Plan (SFYP) for 2011- 2015<sup>2</sup>.

### 3.3 HPNSDP 2011-2016

#### 3.3.1 Information of HPNSDP 2011-2016

The HPNSDP 2011-2016 aims at improving health services and service provision, and strengthening the health system. The sector program functions through 32 Operational Plans (hereinafter referred to as “OPs”), each led by a Line Director (hereinafter referred to as “LD”). Fifty percent of the 32 OPs account for Improving Health Services and the rest for Strengthening the Health System<sup>3</sup>. The budget for each OP is estimated taking 50% from the distribution based on expenditure trend and 50% from the distribution based on budget request made by the LDs. The strength of this approach is that it considers both previous expenditure trend and current budget requests reflecting the future need. Regarding the OP-wise distribution, the estimated budget during 2011 – 2016 is highest for Physical Facilities Development (22%) followed by Maternal, Neonatal, Child and Adolescent Health (14%)<sup>4</sup>. 65% of the total estimated budget are allocated to top six OPs (2 OPs the above mentioned, Hospital Services Management, Community Based Health Care, Family Planning Field Services Delivery and national Nutrition Services).

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<sup>2</sup> HPNSDP Program Implementation Plan Volume.1, MOHFW, 2011.

<sup>3</sup> Annual Program Implementation Report (APIR) 2013, MOHFW, 2013.

<sup>4</sup> HPNSDP Program Implementation Plan Volume.1, MOHFW, 2011

### 3.3.2 Progress of HPNSDP 2011-2016 related to the project

JICA has been supporting the following 6 of the 32 OPs on a priority basis by the Yen Loan Project Phase 1 and SMPP 2; OP1: Maternal, Neonatal, Child and Adolescent Health (MNCAH), OP2: Essential Service Delivery, OP3: Community Based Health Care (CBHC), OP9: Hospital Services management (HSM), OP18: Maternal, Child, Reproductive and Adolescent Health (MCRAH), OP28: Physical Facilities Development (PFD). The target OPs and their financial and physical progress in FY 2012-2013 are shown in the table below. In Revised Annual Development Programme (RADP) FY 2012-2013, percentages of allocation are proceeding smoothly and resulted over 90% by 2013. But the actual implementation, as shown as percentage of physical progress measured by OP indicators, is great variability among OPs. According to the interviews with LDs, especially construction process and installation of equipment have difficulties due to the long process from tender to inauguration in construction and procurement.

Table 3-2: FY 2012-13 Financial and Physical Progress of HPNSDP OPs Targeted by JICA

OP	RADP allocation (Taka in crore)	Released fund (Taka in crore)	Amount spent (Taka in crore)	% expenditure of released fund			% spent of RADP allocation	% of physical progress measured by OP indicators
				GOB	PA	Total		
1: MNCAH	429.3	423.6	402.7	93	95	95	94	53
2: ESD	44.0	44.0	40.8	88	95	93	93	60
3: CBHC	72.5	69.7	67.2	91	97	96	93	100
9: HSM	434.9	434.9	423.4	93	99	97	97	67
18: MCRAH	139.0	138.5	133.4	99	96	96	96	100
26: NES	65.0	65.0	59.2	89	92	91	91	75
28: PFD	482.5	482.5	481.0	100	100	100	100	25
All 32 OPs	2,947.30	2,930.70	2,679.70	97	90	91	91	69

Source: Annual Program Implementation Report (APIR) 2013, MOHFW, 2013.

### 3.3.3 Development Partners for HPNSDP

Development activities of HPNSDP are being implemented by MOHFW, DGHS, DGFP and other agencies through 32 operational plans. IDA (International Development Association) credit and JICA are providing credit; whereas other DPs (DFID, SIDA, USAID, DFATD Canada, EU, KFW, WHO, UNICEF, UNFPA, GIZ, UNAIDS, GFATM, GAVI, KOICA and so on) are providing supports by either grants through a fund managed by the World Bank or by technical assistance<sup>5</sup>.

<sup>5</sup> HPNSDP consortium website: <http://hpnconsortium.org/about/about-hpnsdp>

### 3.4 Health Facility Building

#### 3.4.1 Implementing Agencies for Facilities Improvement

The implementing agencies for medical care facilities improvement including the designs of buildings differ depending upon the scale of hospitals. The District hospital having more than 50/100 beds or higher level are under the jurisdiction of Department of Architecture (DOA) and Public Works Department (PWD) of Ministry of Housing and Public Works (MOHPW), and the public medical facilities in the military hospital or lower level hospitals with less than 50 beds are under the jurisdiction of Health Engineering Department (HED) of MOHFW. In addition, approvals by MOHFW are required when crucial decisions are made such as site selection and design of facilities. The positions and functions of these implementing agencies are shown in Figure 3-2.

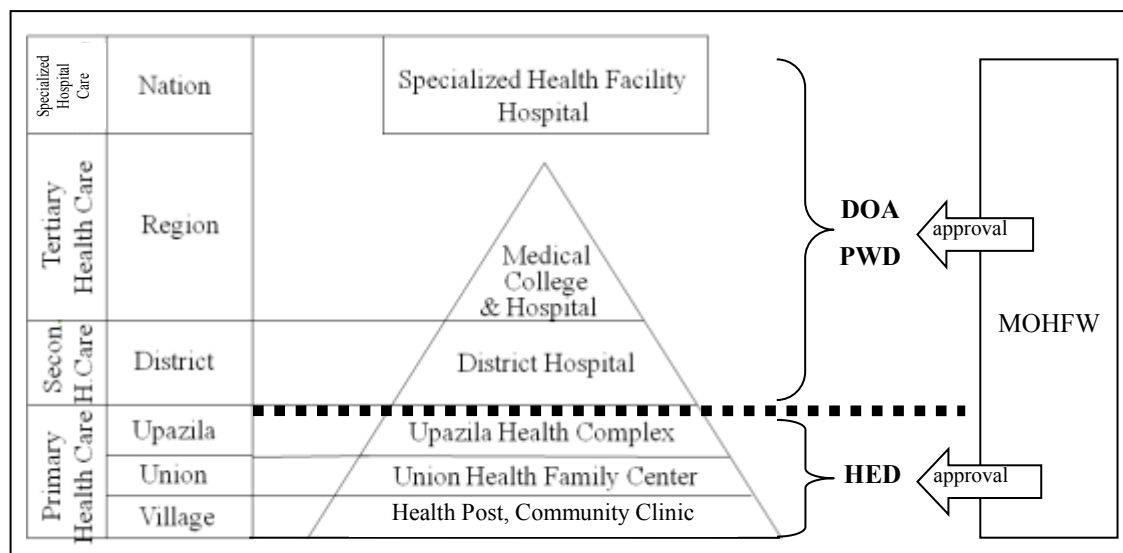


Figure 3-2: Implementing Agency of Medical Facilities by Jurisdiction Subject Size

Source: prepared by the Survey Team based on the information provided by PWD

#### (1) DOA/MOHPW

DOA is under the control of MOHPW and it is the only agency in charge of designing in public construction projects. DOA is mainly in charge of the following works in the improvement of public medical facilities:

- Site determination and preliminary study
- Formulation of master plans and preparation of layout drawings
- Preliminary design and basic design of medical facilities of District hospitals or higher scale

## (2) PWD/MOHPW

PWD is under the control of MOHPW and is a group of engineers in the fields of civil, electrical and mechanical engineering responsible for public works including procurement of construction materials and equipment including heavy machines, construction and construction supervision, as well as preparation and issue of standard price book and specifications. For improvement of public medical facilities, various departments and agencies of the central government including the Health Wing of PWD and site offices are in charge of the following works:

- Rough estimation (for preparation of project plans), electrical and mechanical works and general management	Central government
- Building and civil engineering	Site offices
- Detailed design (composition, electrical and mechanical design) of medical facilities of District hospitals or higher level	Central government
- Quantity survey (including preparation of lists of materials)	Site offices
- Preparation of tender documentation	Central government
- Tender	Central government
- Construction supervision	Site offices

## (3) HED (Health Engineering Department)/MOHFW

HED was set up by Construction, Maintenance and Management Unit (CMMU) in March 2010 as the engineering department under the control of MOHFW at the command of CMMU and is in charge of new construction, reconstruction and rehabilitation of hospitals in the Upazila or lower level (with less than 50 beds). As of 2014, 352 personnel were working with HED, but 139 positions remained vacant (of which 105 positions were newly set up). Necessary human resources are lacking for the current work volume. Therefore, some works may be referred to private consultants. Construction works are executed by the contractors registered by HED.

The main works of HED are as follows:

- Design,
- Quantity survey,
- Construction supervision of medical health facilities

18 persons in charge of building design, 35 persons in charge of quantity survey, 12 electrical technicians, 0 mechanics (assigning of 4 mechanics is planned).

Organizational Chart of MOHPW, DOA, PWD and HED is described in Annex 4.

### 3.4.2 OPs Related to Health Facilities

#### (1) Physical Facilities Development (PFD OP)

OP 28 (Physical Facility Development) consists of the activities of 45 projects (41 construction projects, one vehicle procurement project, one consultant employment project, one human resource training project and one organization setup project) in addition to 277 uncompleted projects carried over from HNSP 2003-2011.

#### (2) Operation plan implementation system

The implementation system for OP 28 is shown below.

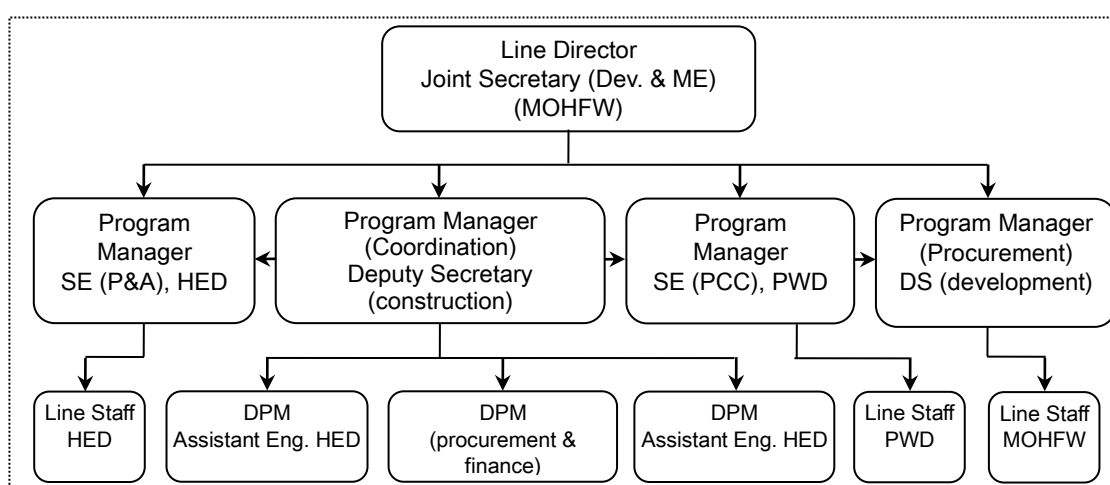


Figure 3-3: Implementation System for Health Facility in HPNSDP

Source: PFD OP

### 3.5 Medical Equipment

#### 3.5.1 Procurement of Medical Equipment

##### (1) Guidelines

The procurement of medical equipment for public health facilities is required to conform to PPR2008 and PPA2006 as well as facility construction. In addition, the procurement is required to conform to “Guidelines Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers” if the funding resources are GOB or Reimbursement Project Aid (RPA) by pool fund.

##### (2) Procurement system

The procurement of medical equipment for secondary and tertiary hospitals is managed by the Director of Hospital & Clinics (Line Director of Hospital Service Management (HSM) OP) for

planning and Central Medical Supply Depot (hereinafter referred to as “CMSD”) of DGHS for tendering under MOHFW’s approval. The process of procurement is described in 8.1.3 in Chapter 8. The procurement of medical equipment for primary health facilities is managed by the Line Director of Essential Service Delivery (ESD) OP.

### 3.5.2 Maintenance of Medical Equipment

National Equipment Maintenance and Engineering Workshop (hereinafter referred to as “NEMEW”), located in Mohakhali, is a department responsible for maintenance of medical equipment. This is one of the implementing authorities under the MOHFW. This organization has 257 engineers and administrators in the entire country equipped with workshops in head office in Dhaka, some of MCHs and district offices in various parts of the country. NEMEW is responsible for providing maintenance service to all equipment after the one-year warranty period has expired, except for certain equipment for which maintenance agreements have been concluded with its agents.

The name of workshop in the district office is District Equipment Maintenance and Engineering Workshop (hereinafter referred to as “DEMEW”), which is located in 7 divisions: 1) Dhaka, 2) Chittagong, 3) Sylhet, 4) Rajshahi, 5) Rangpur, 6) Barisal, and 7) Khulna. DEMEW of Dhaka, located in the same place of NEMEW, has 51 staffs divided into 8 groups. They are responsible for provision of maintenance service in Dhaka city and 16 districts of Dhaka division. The number of staff in DEMEW in other divisions is as follows; 39 staffs in Chittagong covering Chittagong and 10 districts, 39 staffs in Sylhet covering Sylhet and 3 districts, 39 staffs in Rajshahi covering Rajshahi and 6 district, 39 staffs in Rangpur covering Rangpur and 7 districts, 39 staffs in Barisal covering Barisal and 5 districts and 39 staffs in Khulna covering Khulna and 9 districts. Each DEMEW is also responsible for providing maintenance service for all equipment after the one-year warranty period.

### 3.5.3 OPs Related to Medical Equipment

The MOHFW has two major plans for the operation of its health facilities. For the application of these two OPs, the ministry divides public health facilities into those with less than approx. 100 beds as Essential Service Delivery (ESD) and those with more than approx. 100 beds as Hospital Service Management (HSM). The OP for ESD is applied to CCs, UFWCs and UHCs, while that for HSM is applied to district hospitals (DHs), medical college hospitals (hereinafter referred to as “MCH”s) and specialised hospitals. Almost all the plans for procurement and maintenance of medical equipment managed by MOHFW are included in the two OPs (certain equipment including that for nursing care and vaccination is not included in the OPs.) They describe procurement plans and maintenance/ inspection of medical equipment among the

priority issues. However, there is no independent budget item for medical equipment in the OPs. Instead, it is included in the item, “Machinery and other equipment,” with other non-medical equipment. The budget for repair parts of medical equipment is also combined with that of non-medical equipment. Therefore, it is very difficult to analyze them separately.

(1) Primary health facilities and the OP for Essential Service Delivery (ESD)

The current OP for ESD for the period between 2011 and 2016 describes “Strengthening Upazila Health System and Referral System” as Sub-project 7 of its major sub-projects. MOHFW is implementing a pilot project in some UHCs for a planned period of two to three years by assigning required numbers of doctors, nurses and paramedics and providing equipment required for caesarean section and other operations to those UHCs. The table below shows the equipment to be procured for the pilot project. If the pilot project is completed successfully, it will be gradually extended to the entire country.

Table 3-3: List of Medical Equipment to be Procured for the Improvement Plan of 418 UHCs

No.	Items	Amount	Unit price (in Taka)	Total (in Taka)
1	Air conditioner in the radiology laboratory	80	64,000	5,120,000
2	Electrocardiograph recorder	105	255,000	26,775,000
3	Diagnostic ultrasound system	285	1,194,000	340,290,000
4	300 mA radiography system	80	1,640,000	131,200,000
5	100cc motorcycle	1,672	110,000	183,920,000
6	Equipment set for a UHC with 30 to 50 beds	264	4,730,000	1,248,720,000
7	Equipment set for 31 beds to be installed	8	2,942,000	23,536,000

Source: OP 2 “Strengthening Upazila Health System and Referral System”

(2) Secondary and tertiary health facilities and the OP for Hospital Service Management (HSM)

The table below shows the priority sub-projects/activities described in the OP for HSM for the period between 2011 and 2016.

Table 3-4: Priority Sub-projects/Activities of the OP for HSM

No	Sub-project / Activity
A	Continuation of the Public Sector Hospital Support Services
B	Introduction of Medical Waste Management in the Public & Private Hospitals
C	Scale up of Structured Referral System
D	Safe Blood Transfusion
E	Quality Assurance (QA) Program
F	Strengthening of the Hospital Services through Decentralization/Autonomy
G	Development & Introduction of Hospital and Laboratory Accreditation
H	Total Quality Management
I	Strengthening of the Hospital Services delivery

Some of the priority sub-projects/activities mentioned above set forth policies on medical

equipment for secondary and tertiary health facilities as follows.

Table 3-5: Priority Sub-projects/Activities Related Medical Equipment in the OP for HSM

No	Sub-project/ Component	Activities
A	Continuation of the Public Sector Hospital Support Services	Procurement of materials and equipment for extension of existing hospitals and new hospitals
C	Scale up of Structured Referral System	Procurement of required equipment for UHCs. And expansion of the procurement will be required to DHs and MCHs from now on.
D	Safe Blood Transfusion	Establishment of a transfusion center and nearby facilities performing transfusion, the procurement of equipment required for blood transfusion and blood test.
I	Strengthening of the Hospital Services delivery	Independent some priority activities are closely related with medical equipment as follows.
I-1	Procurement of equipment required for EOC for hospitals at the level of DH	Hospital based EOC & Gender sensitivity (details of the procurement are described in the OP for MCHs.)
I-2	Development of capacity to provide maintenance service of medical equipment	Strengthening of the National Electro-medical Workshop (NEMEW). Service of medical equipment mostly composed of electronic equipment
I-3	Establishment of Central Medical Gas Pipe line	Oxygen plant and medical gas pipelines in all the secondary and tertiary hospitals.
I-4	Construction of an outpatient ward and installation of CT, MRI and radiography systems	The systems are planned in the plan for the extension of the pediatric hospital in Dhaka.
I-5	Establishment of Shishu Bikash Kendra at Secondary and Tertiary level Hospital.	The fund provided in the Yen Loan Project Phase 1 is to be used for the procurement and installation of the laboratory equipment.
I-6	Demand from Medical College Hospital Specialized Hospitals and District Hospital includes a plan to procure medical equipment for secondary and tertiary health facilities.	The basic policy of the plan is to procure the latest advanced medical equipment for each health facility in accordance with its demand. Approximately 5,669 million taka has been appropriated to this plan over a period of five years. As the list of candidate equipment to be procured has been prepared, MOHFW is expected to prioritize the items in the list and appropriate budget in accordance with priority.

### 3.6 Human Resources for Health (HRH)

#### 3.6.1 Medical Education System

The education system in Bangladesh consists of 5 years of primary education, 3 years of junior secondary education, 2 years of secondary education, 3 years of higher secondary education, and from 3 to 4 years of higher education (diploma and bachelor degree). In order to go through the educational system, students have to pass graduation exams for the certificate at each education level called PSC (Primary School Certificate), JSC (Junior Secondary Certificate), SSC (Secondary School Certificate), and HSC (Higher Secondary Certificate) respectively. However, JSC holders can receive 2 years SSC vocational training and expert training while SSC holders are able to go on to diploma and certificate courses. Overall educational structure



and institutions are shown in Figure 3-4.

Age	Exam	Doctor		Nurse (&Midwefery)		Medical Technologist	Other Health Workforces	Other Types of Personnel						
25+			Ph.D (Medical)	Post BSc					PH. D (Engr)				Ph. D (Education)	
24+		PostMBBS S Dipl												
23+		M.Phil (Medical)												
22+		MBBS, BDS		BSc in Nurse-Midwife		MSc in Medical Technology		LL M	MSc (Engr)	MSc. (Agr)	MBA	M.Ed & MA(Edn)	MFA	
21+								LLB (Hons)	BSc.Eng BSc.Agr BSc.Text BSc. Leath	BSc. Eng	BSc (Tech. Edn)	BBA		B.Ed Dip.Ed & BP ED
20+				Dipl in Nursing or Midwife	BSc in Medical Technology	BFA								
19+														
18+														
17+	HSC	Higher Secondary Education (Intermediate College)				Dipl in Medical Technology	•SMCAO (3 years) •HA (3- 6 months) •FWA (1-18 motnhs) •FWV (6months) •etc	Higher Secondary Education (Intermediate College)	Dipl (Eng)	HSC Voc, C in Ag	Certificate in Edu.	Pre-Degree BFA	Dipl in Comm	
16+														
15+	SSC	Secondary Education							Trade Certificate/ SSC Vocational	ARTISAN COURSE e.g. CERAMICS				
14+	JSC	Jnior Secondary Education												
13+														
12+														
11+	PSC	Primary Education												
10+														
9+														
8+														
7+														
6+														
5+		Pre-Primary Education												
4+														
3+														

Figure 3-4: Educational Structure and Institutions

Source : Bangladesh Bureau of Educational Information and Statistics (Edited by the Survey Team)

### 3.6.2 Medical Education Courses

There are various courses according to the types of health personnel but in this paragraph, courses for major health personnel are introduced. More details are indicated in Annex 5.

#### (1) Courses for general and specialized doctors

Students who want to be a doctor must take a Bachelor of Medicine and Bachelor of Surgery (MBBS) course offered by public and private universities. MBBS, based on the British medical curriculum for graduate level, is a graduate level degree which consists of a 5 year academic course and a 1 year internship at hospitals. After passing the graduation exam<sup>6</sup> at the 5<sup>th</sup> year of the course and licensed as doctors, they are assigned into hospitals as intern, and work at different departments such as the department of surgery and internal medicine for several

<sup>6</sup> According to the Medical and Dental Council Act constituted in 1980 (a revised version of a previous Act constituted in 1973), regarding doctors in Bangladesh, those who pass the certification exam prepared by the Bangladesh Medical and Dental Council (BMDC) are qualified as a doctor.

months by rotation.

The curriculum in MBBS consists of three phases. The compositions of curriculum in phase 1 and 3 are integrated into three terms for 18 months while phase 2 takes 24 months (term 1 and 2 in the third year and term 3 in the fourth year). At the end of each phase, there are professional exams. Course curriculum in MBBS is shown in Figure 3-5.

Subjects	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<b>Phase 1</b> 18 months (3 Terms) 1st Prof. Exam		<b>Phase 2</b> 24 months (3 Terms) 2nd Prof. Exam		<b>Phase 3</b> 18 months (3 Terms) Final Exam	
Anatomy						
Physiology						
Biochemistry						
Community Medicine						
Pharmacology						
Pathology						
Microbiology						
Forensic Medicine						
Medicine						
Surgery						
Gynae & Obs.						
Internship (Clinical Training)						

Figure 3-5: Course Curriculum in MBBS

Source : Year Book 2008 – 2011, Dhaka MCH (Edited by the Survey Team)

Those who complete the internship become registered doctors, namely general physicians (GPs) automatically authorized by Bangladesh Medical and Dental Council (BMDC). However, in order to be specialized as a doctor, it is necessary to take an entrance exam by BSMMU for going to the resident course such as Doctor of Medicine (MD), Master of Science (MSc) offered by BSMMU, and Fellow of College of Physicians and Surgeons (FCPS)<sup>7</sup> offered by the Bangladesh College of Physicians and Surgeons (BCPS), all of which can be a carrier path for working at professor level. There are also other choices as postgraduate courses for 1 to 4 years such as Master of Public Health (MPH), Master of Philosophy (M.Phil.), overseas courses and so on. Resident doctors usually stay at the same department for 3-4 years. The basic steps to be a specialized doctor are shown in the Figure below.

<sup>7</sup> MD and MSc are basically academic oriented degrees while FCPS is basically clinical training oriented. In reality, FCPS degree holders are more successful doctors compared to MD or MSc because they are well experienced with vigorous training process. The team visited Shishu Hospital (Children Hospital) which offers postgraduate courses such as FCPS, MD, DCH (Diploma in Child Health), certificate courses in pediatrics, and BSc in Health Technology.

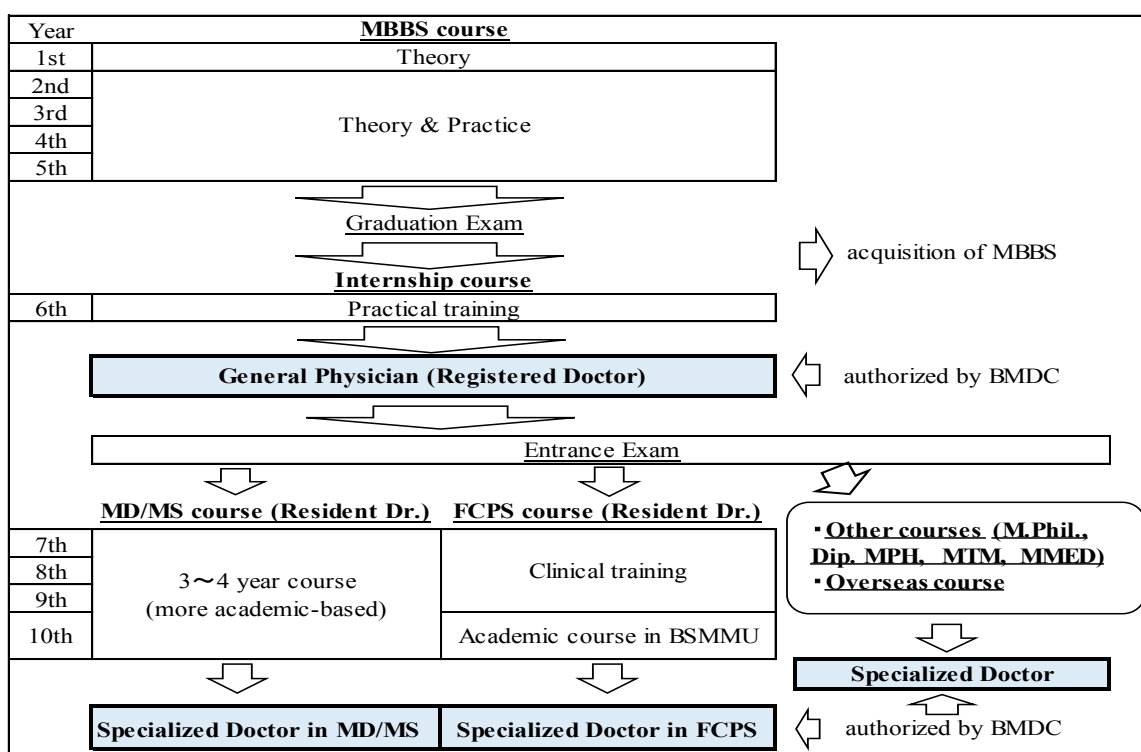


Figure 3-6: Basic Steps of Doctor's Career to be a Specialized Doctor

Source: Prepared by the Survey Team

## (2) Courses for nurses

There are 3-year Diploma course and 4 year course in BSc in Nursing and Midwifery<sup>8</sup> which require HSC for the entrance to nursing colleges and institutions. MOHFW is presently preparing to start MSc course. Additionally, registered nurse midwives who have certain years of practical experiences can apply to take 2-year post basic course in BSc. Those who complete Diploma or BSc course are officially approved by BNC as Registered Nurse Midwife. In Bangladesh, there are 91, 22 and 14 both private and public nursing education institutions offering Diploma, BSc and post-basic BSc in the country.

<sup>8</sup> On the basis of The Bangladesh Nursing Council Ordinance constituted in 1983, The Bangladesh Nursing Council is responsible for the creation of nursing education curriculum and recognition of qualification (Matsumoto 2011).

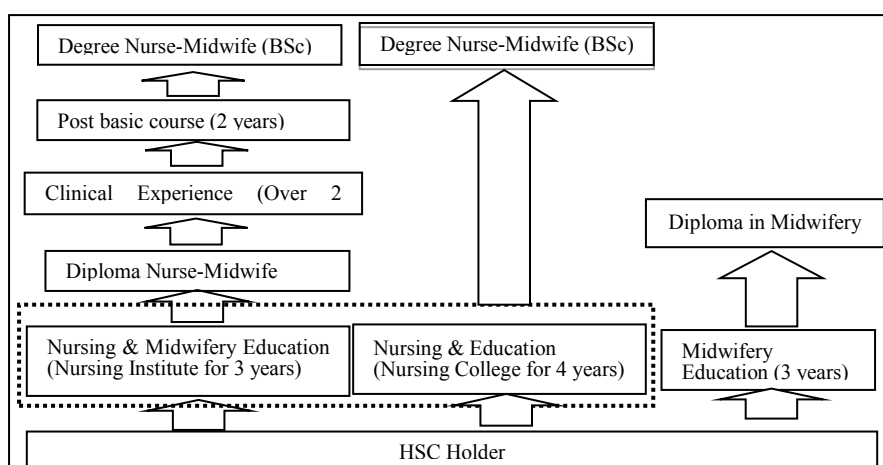


Figure 3-7: Course System of Nurse and Midwife  
Source: Prepared by the Survey Team

### (3) Courses for medical technologist

#### 1) Overview

Regarding medical technologist, individual enters Institute of Health Technology (IHT) and takes a course such as 3 year Diploma course<sup>9</sup>, 4 year BSc course, or 2 year MSc course (after the completion of BSc). There are 112 IHTs in total (government: 11; private: 97; Government-Private: 4). Diploma in Medical Technology courses consist of 7 disciplines as Diploma in Laboratory, Physiotherapy, Radiotherapy, Radiology, Pharmacy and Dental under State Medical Faculty. There are 4 BSc courses as BSc in Physiotherapy, Laboratory, Radiology & Imaging and dentistry. BSc course is offered only by Dhaka IHT while MSc course is offered by private IHTs. Students study theoretical issues in the 1<sup>st</sup> and 2<sup>nd</sup> year and they are supposed to take practical training at tertiary hospital for 18 weeks at the 3<sup>rd</sup> year of IHT in order to learn how to operate advanced medical equipment.



Figure 3-8: Dhaka IHT

<sup>9</sup> In Diploma which is intended for SSC holders, the duration of the course shifted from 3 years (12 week practical training at tertiary hospital) to 4 years (3 year academic and 1 year practical training) in 2012. Along with that shift, BSc course, intended for active technologists with Diploma and HSC holders, was also established at only Dhaka IHT.

### 3.6.3 Administration of HRH

#### (1) Recruitment

Promotion and wage structures for the recruitment of personnel such as doctors and nurses conform to the personnel assignment system for public servants determined by GOB. This can be applied to other non-cadre class-1 and class-2 positions under the revenue budget. Figure 3-9 shows the whole recruitment process of government staff.

#### (2) Deployment

Securing the equity, Bangladesh constitutions upholds the deployment and distribution of the workforce. In the process of deployment, authorizations by MOHFW, Ministry of Public Administration (MOPA) and PSC are necessary. The procedure for establishing new public servant posts additionally requires an approval of MOF and take from 2 to 3 years.

Specifically, deployment takes the following steps; i) arising/request of needs to fill vacancy by medical institutions and organizations, ii) Directorate and MOHFW process administrative issue and seek MOPA's approval to fill the sanctioned posts, iii) validity examination by MOPA, iv) examination and deployment of personnel according to the budget by MOF, v) PSC's selecting of candidates, vi) job offer and posting assignment implemented by MOPA and MOHFW. The professional group such as medical officers and dental surgeons are directly recruited and deployed in both health and family planning cadres in Bangladesh Civil Service, through the recommendations of the PSC.

According to the interview with HRM, the requested posts/numbers are usually reduced at the stage of examination by MOPA and MOF, and the final number of deployed personnel is usually a half of the requested number by medical institutions.

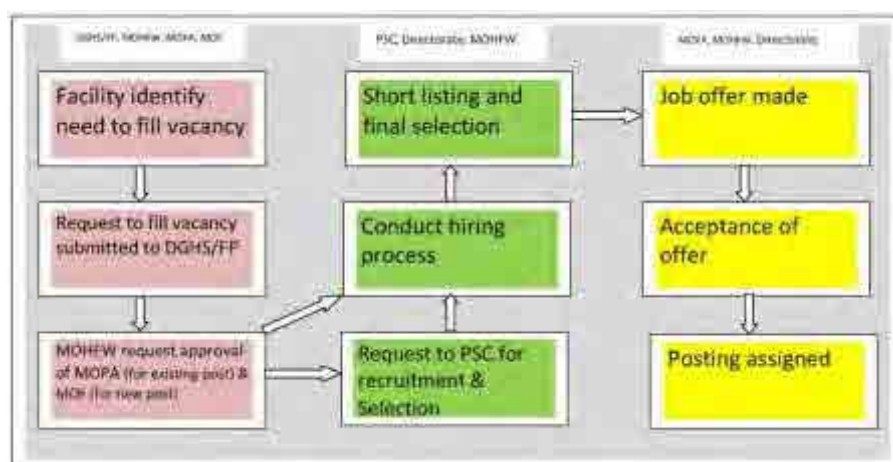


Figure 3-9: Recruitment and Deployment Processes of Government Staff

Source: HRM Unit (2013), "HRH Country Profile Bangladesh", Human Resources Management Unit, MOHFW

After the approval of doctor's deployment, they are first assigned into primary medical institutions like CC for several years. Then, they go to secondary (UHC or DH) for several years and lastly can work at tertiary medical institutions (MCH or specialized hospital). Transfer and recruiting system are not always orderly implemented so there are some health personnel like senior doctors and nurses who work at the same hospital for a long time. Special allowance is supposed to be given to those who work in remote areas with fragile infrastructure. However, there is no clear definition/standard of remote areas.

### (3) Employment index of registered HRH

According to the following table, there are only 3.49 doctors per 10,000 population in Bangladesh while there are 14 in the world and 5.4 in Asia continent per the same population. Additionally, there are 1.64 nurses per 10,000 population, which is lower than the average in the world and Asia.

However, in Bangladesh there are many community health workers<sup>10</sup> and NGOs working at grass-root (primary) level, compared to the world standard as observed in the table. The table below indicates the total number and density of health personnel (number of health personnel per 10, 000 population).

Table 3-6: Number and Density of HRH in Bangladesh

Health Personnel	Total	Density (per 10,000 population)		
		Bangladesh	World	Asia
Doctors (Registered) (Estimated No. of doctors available in the country)	53,063 (43,537)	3.49	14.0	5.4
Dental surgeons (Registered)	4,165	0.27	3.0	0.7
Nurses (Registered as on March 2010) (Estimated No. of nurses available in the country)	25,018 (15,023)	1.64	29.7	13.3
Mid -wives (Registered)	23,472	1.54		
Pharmaceutical personnel	9,411	0.62	4.1	3.8
Medical technologist (Registered) (produced up to 2002)	14,806	0.97	-	-
Family planning officers/Assistant family planning officers	546/1,440	0.04/0.09	-	-
Community health workers	48,692	3.20	4	0.9
Medical assistants	7,365	0.48	-	-
Health assistant (HA) (Sanctioned)	19,274	1.27	-	-
Assistant health inspectors (Sanctioned)	3,655	0.24	-	-
Family welfare visitors (Sanctioned)	5,705	0.38	-	-
Health inspectors (Existing)	1,125	0.07	-	-
Family planning inspectors (Sanctioned)	4,500	0.30	-	-
Family welfare assistants (Existing)	23,500	1.54	-	-

Source: HRD Data Sheet 2011, Health Bulletin 2011, World Health Statistics 2011 (Edited by the Survey Team)

\*Colored personnel is entitled to medical qualification gained through specialized medical education.

<sup>10</sup> Community health workers, selected in communities and trained in a short-term training financially supported by international organizations and NGOs, usually work at low pay for assisting midwives and vaccinating people. They do not offer medical service since because they do not have a basic medical knowledge.

### 3.6.4 Development Policy of HRH

Along with the national health development plans and comprehensive policies, some plans focusing on HRH were developed. A comprehensive HRH strategy is currently being developed by the Human Resource Development Unit of MOHFW, Bangladesh Secretariat. The MOHFW works primarily on the following development plans of HRH; (1) Bangladesh Health Workforces Strategy (BHW strategy). As a long-term master plan of HRH, (2) Health Human Resource Master Plan (2010-2040), has been already drafted. However, it has been neither completed nor authorized yet.

#### (1) Bangladesh Health Workforce Strategy

BHW strategy was adopted in 2009 and has been up-dated many times, throughout the DGFP, the DGHS, the Directorate of Nursing Services, LD-MIS, LD-IST, LD-PSE, and various training institutions. According to the person in charge of HRM OP, it is supposed to be finalized at the end of 2014 as Bangladesh Health Workforce Strategy 2014.

In this strategy, strategic objectives are set based on the aspects of health workforce planning, quality assurance of health workforce education and training, stewardship/regulation of health human resources, recruitment, career development and retention, performance management processes, leadership and coordination of human resource functions, health workforce financing, and national human resource management information system.

The specific measures are “the development of Bangladesh Health Master Plan, improved incentives to work in rural and remote areas, increased community-focused aspects into training programs, and improved quality of health workforce education and planning, including improving the capacity of teaching and training institutions with a shift from a more knowledge-based to skills-based approach”(UNSW 2011). The strategic objectives and activities in BHW strategy are also reflected in HPNSDP 2011-2016 and the draft of Bangladesh Health Human Resource Master Plan (2010- 2040).

#### (2) Draft of Bangladesh Health Human Resource Master Plan (2010-2040)

This is a need based plan with a long-term (30 years) vision focusing on scaling up the production and deployment of each type of health workforce, particularly those in acute shortage, keeping in view the country and global perspectives, and upgrading the quality of services and education. Currently, the draft has been completed in June 2014 but this master plan is fully dependent on the policy framework in the BHW strategy which is not yet finalized. From the interview with the person of HRM OP, the plan shall be desirably completed within 2015 through the coordination of international consultants.

### 3.6.5 OPs Related to Training

#### (1) In-Service Training (IST) system under OPs

Among 32 OPs in HPNSDP 2011-2016, there are 5 OPs focusing primarily on HRH; (1) OP 11: In-Service Training (IST), (2) OP 12: Pre-Service Training (PSE), (3) OP25: Training, Research and Development (TRD), (4) OP26: Nursing Education and Service (NES) and (5): OP29: Human Resource Management (HRM). Previously, all training activities were organized through IST OP but during Health and Population Sector Program 2003-2011 (HNPSP)<sup>11</sup> training activities were decentralized among different OPs. IST OP<sup>12</sup> is still a leading and specialized OP constituting 98% of training organization.

Currently, trainings for HRH are conducted respectively in 32 OPs. Out of the total expenditure of HPNSDP in 2012-2013, only 10 % (285.4 crore) was appropriated for all trainings in OPs (including workshops/ seminars / orientations). CBHC OP, constituting 70% (473 million Taka) of the total expenditure, spent the most on training (473 million taka) followed by IST (451 million taka) and NCDC (426 million taka). The following table indicates the cost and number of participants in 32 OP trainings. Due to the time limitation, information about number of trainings in each OP has not been acquired in this survey.

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<sup>11</sup> There was a single OP on HRM, which was divided into three OPs (MOHFW/DGHS/DGFP) in the 2nd sector program HNPSP (2003-11). In the present sector program (HPNSDP, 2011-16) HR activities are planned in one OP for better coordination, to avoid duplication and to maximize utilization of resources.

<sup>12</sup> Trainings in IST OP are coordinated by a special unit called TTU (Technical Training Unit) which plays an important role in providing technical support for the training implementation, and specialized training implementing agencies called CME (Centre for Medical Education), NIPSOM (National Institute of Preventive and Social Medicine), IPH (Institute of Public Health), IEDCR (Institute of Epidemiology Disease Control and Research), NIKDU (National Institute of Kidney Diseases & Urology), NIMHR (National Institute of Mental Health Research), BCPS (Bangladesh College of Physicians and Surgeons), and ICMH (Institute of Child and Mother Health), all of which are given technical support by TTU.



Table 3-7: Cost Distribution and Participants in Training and Workshop in 2012-13 (OPs)

(Unit: Million Taka)

OP	Cost for training and workshop (Total OP expenditure)	Training as % of total OP expenditure	No. of training participants (Local)	No. of training participants (Foreign)	No. of workshop/seminar participants
MNCAH	34 (4,027)	8%	165,011	0	60,670
ESD	33 (408)	8%	2,186	50	851
CBHC	473 (672)	70%	467,413	89	0
TBLC	49 (619)	8%	22,876	0	230
NASP	75 (223)	34%	225	0	30,438
CDC	74 (1,032)	7%	14,734	0	165,202
NCDC	426 (1,125)	38%	0	0	72,000
NEC	4 (40)	9%	156	0	275
HSM	63 (4,234)	1%	0	64	8,705
AMC	8 (128)	6%	0	5	1,006
HEP	17 (180)	9%	2,460	18	0
NNS	44 (361)	12%	12,029	0	1,633
MCRAH	29 (1,334)	2%	2,297	37	1,600
CCSD	38 (1,537)	2%	316	70	9,948
FPFSD	6 (840)	1%	0	0	7,353
IEC	21 (213)	10%	0	0	8,320
IST	451 (462)	98%	27,665	561	0
PSE	21 (1,596)	1%	150	64	0
PMR	14 (82)	17%	1,040	0	1,610
HIS&eH	22 (1,084)	2%	813	0	3,243
PLSM	3 (619)	1%	176	0	340
PME	12 (19)	65%	0	0	234,855
MIS	20 (125)	16%	30,950	0	359
PSSM	2 (129)	1%	2	2	70
TRD	98 (159)	61%	8,045	34	1,180
NES	178 (592)	30%	1,025	240	250
SDAM	0.4 (6)	6%	44	0	0
PFD	16 (4,810)	0%	226	24	0
HRM	21 (24)	90%	367	45	239
SWPMM	10 (28)	34%	0	13	1,141
IFM	10 (24)	40%	144	8	565
HEF	7 (46)	16%	220	10	306
<b>All OPs</b>	<b>2,583 (26,779)</b>	<b>10%</b>	<b>760,570</b>	<b>1,334</b>	<b>612,389</b>

Source : Health Bulletin 2013, APIR 2013 (Annual Program Implementation Report) (Edited by the Survey Team)

Out of 760,570 participants in all trainings, 699,724 participants (or 92%) were participants for 1-2 days which constitute 46% of the total local training costs while 53,240 (7%) were for 3-30 days, 6,085 (0.8%) were for 1-6 months, and 1,521 (0.2%) were for more than 6 months (2013).

According to the interview survey at MCHs, not all the doctors have participated in local trainings under OPs. Also, there is very few training for medical technologist in OPs so most of them have participated in the training organized by donor or foreign agencies.

## (2) Training courses by OPs related to JICA's support

The background of the training courses by OP is explained below.

### 1) CBHC OP

The general objective of CBHC OP is to improve the overall health status of the rural community by providing health, family planning and nutritional services with special emphasis

to the poor<sup>13</sup>.

In primary health services plan, GOB took initiative to set up total 13,500 CCs as one clinic per 6,000 people at the country's rural areas where nearly three-quarters of the country's population are living. In 1998-2001, over 10,723 clinics were built with the donated land to ensure the active participation of the community. In 2009, GOB developed an activity plan of "Revitalization of Community Health Care Initiative in Bangladesh (RHCIB) Project" for five years (July 2009-June 2014) as a priority to begin the performance of CCs. It should be noted that, at the last meeting of ECNEC held on 5th November 2013, the extension of project period until December 2014 has been approved. At that meeting, a decision was taken to build additional 361 CCs and to hire 361 CHCP personnel for remote and mountain areas. So the goal of total CCs went to 13,861. As of July 2014, 12,770 CCs have been established, 547 CCs are in process of construction and 544 CCs remain without land donation. After the closure of RHCIB in December 2014, CBHC OP will take over the activities of RHCIB including CC construction<sup>14</sup>.

CBHC OP conducts several training courses for expanding primary health services to community level with community participation and ownership.

A Community Health Care Provider (CHCP) is allocated to each CC to provide primary health care, health education and referral service after the training for 12 weeks. According to the interview with the LD of CBHC, a total of 13,292 persons were trained in CHCP and 13,146 CHCPs are working at CCs as of June 2014.

Each CC has one managing body titled Community Group (CG) which represents different groups of people of the catchment area of CC. Concerned GOB staff provide technical and secretarial support to the CG for smooth functioning of CC. As a managing body of CC, CG works for maintenance, security, cleanliness, fund raising and utilization of their CC. CG consists of 13 to 17 members (with at least one third female members) elected by the community<sup>15</sup>. The Community Support Group (CSG) assists their CG by collecting funds from local resources and building awareness of maternal and child health and family planning methods mainly. CSG consists of 10 to 15 members identified as self-motivated persons by CG members<sup>16</sup>. CG and CSG shall perform their responsibility intending to improve quality of

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<sup>13</sup> CBHC OP document, 2014

<sup>14</sup> Improvement report of RHCIB project, June 2014, RHCIB.

<sup>15</sup> CBHC OP document, 2011

<sup>16</sup> RHCIB homepage, <http://www.communityclinic.gov.bd/index.php>

services and to make the program sustainable. CBHC OP takes initiative to increase the capacity of CG and CSG through training and motivation. The duration of training for CG is 2 days and for CSG is 1 day.

The concept of CG and CSG concept was taken from Narsingdi model, which was developed through JICA Save Motherhood Promotion Project Phase 1 (SMPP1), but not CG as it was with Community Clinics since the beginning in 1998. Further information of SMPP is available in Chapter 5.

## 2) HSM OP

One of the specific objectives of HSM OP is to improve the quality of care in the health care services by introducing of National Health Care Standards, Quality Assurance program and Total Quality Management (5S-Kaizen-TQM). Therefore, HSM OP planned activities for application of TQM concept in hospital services such as training, seminars and some repair of equipment<sup>17</sup>. HSM targets 9 medical college hospitals, 20 DHs and 20 UHCs. SMPP2 has been supporting MOHFW for implementation and maintenance of TQM activities at hospital level. JICA supports the activities on TQM by HSM OP in FY2014-2016 by the Yen Loan Project Phase 1 coordinating with SMPP2<sup>18</sup>.

## 3) MCRAH OP

One of the specific objectives of MCRAH OP is to ensure services to provide safe delivery at home and at facilities. In order to increase coverage of safe delivery conducted both at home and facilities, and to meet need of EOC (Obstetric first aid and identification of 'at risk' pregnancy and referral) at the community level, six months skill based practical training on Midwifery or EOC are provided to FWVs by this OP. The training is ongoing and will continue throughout the planned period of this OP 2011-2016<sup>19</sup>. JICA has been supporting the training technically and financially to improve the MNCH in Bangladesh and the training was conducted as scheduled.

## 3.7 Hospital Service Management

The major factors in hospital service management are financial management, facilities management, human resources management, supply management of goods, patient information management and staff education. For this, hospital administrators should make sure hospitals

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<sup>17</sup> HSM OP document, 2011

<sup>18</sup> Revised HSM OP document, 2014

<sup>19</sup> MCRAH OP document, 2011

operate efficiently and provide adequate medical care to patients. Hospital administrators need to keep up with advances in medicine, computerized diagnostic and treatment equipment, data processing technology, government regulations, health insurance changes, and financing options. While doctors strive to keep the blood flowing and the heart beating, the hospital administrator is doing his job in keeping the hospital alive and healthy.

#### 3.7.1 Financial Management

Regarding financial management, MOHFW and DGHS provide medical supplies and consumables, maintenance fees and facility rehabilitation costs to affiliated health facilities. Since the budget management of public hospitals is centralized, not demand-based, hospital management bodies do not have economic incentives to make their hospital management more efficient.

#### 3.7.2 Human Resource Management

The number of medical staff is outside the control of health administrators, and the situation in the absolute shortage of major health personnel (doctors, nurses and midwives), the absence of a long-term strategy for human resource in health, imbalanced deployment of medical staff, and inadequate knowledge and skills of medical staff are a national level crisis.

#### 3.7.3 Patient Information Management

Patient information management system or regulations for the patient information management have not been operated in Bangladesh. The result of observation focusing on patient information management is available in the present status of hospital management in 4.4 in Chapter 4.

## **CHAPTER 4:**

### **Present Status of the Survey Area**



## **CHAPTER 4: Present Status of the Survey Area**

### **4.1 Overview of Survey Sites**

#### **4.1.1 Survey Sites**

##### **(1) Health facilities and institutes visited**

The Survey Team visited tertiary and secondary hospitals, specialized hospitals and institutes, and primary health facilities. The information and statistics of visited health facilities and institutes in 2013 is available in Table 4-1.

##### **(2) Nursing colleges visited**

The Survey Team visited 7 BSc nursing colleges attached to MCHs (Chittagong, Dhaka, Mymensingh, Rajshahi, Rangpur, M.A.G. Osmani in Sylhet and Sher-e-Bangla in Barisal), Faculty of Nursing of BSMMU and a post-basic BSc College of Nursing in Mohakali to consider collaboration with future technical cooperation for nursing education.

#### **4.1.2 Overview of the MCHs and Medical University Visited**

The results of visit to Sher-e-Bangla MCH, Barisal, Chittagong MCH, Dhaka MCH, Khulna MCH, Rajshahi MCH, Rangpur MCH and M.A.G. Osmani MCH, Sylhet and BSMMU are described below. The detailed results of the field survey at 7 MCHs and BSMMU are available in Annex 9.

##### **(1) Organization**

The MCHs are located at division level and are affiliated to provide specialty care in many disciplines. Seven MCHs mentioned in the above are under DGHS, MOHFW. The BSMMU, both the university and its affiliated hospital are autonomous.

##### **(2) Service hours**

Generally, Out-patient Department opens 8:30 – 14:00 from Sunday to Thursday. Emergency Department accepts patients in 24 hours every day.

##### **(3) Flow of diagnosis and treatment for patients**

When a patient visits a MCH, the patient goes to the reception to buy a consultation ticket for 10 Taka. The reception for out-patients is separated by sex generally. The patient goes to the Out-patient Department to be diagnosed and treated. If further diagnosis is needed, the patient goes to the department where physicians advise him/her to take clinical examinations. The patient buys a ticket for clinical examinations at the reception of each department. The patient

takes examinations and waits for the results. When it takes time to receive the test results, the patients have to return to receive their results the following day. Physicians treat patients according to diagnosis, and if the patient needs medication, essential drugs are provided at the pharmacy free of charge. Patients can choose whether taking examinations and treatment or not, depending on their financial situation.

All MCHs accept any patient for treatment and admission. Therefore, the hospitals are always very crowded with a lot of patients and their families.



Table 4-1: Visited Hospital Information and Statistics in 2013

Hospital level	Health Facility	Division	Number of cases							Utilization of services				Surgery		Health Staff		
			Beds	OPD	Emergency case	Admission	Death	Delivery	C-section	Total patient days /year	Bed Occupancy Rate (%)	Average Length of Hospital Stay	Hospital Death Rate (%)	Major Surgeries	Minor Surgeries	Doctor	Nurse	Medical Technologist
T	Dhaka MCH	Dhaka	2,400	634,655	589,229	95,319	8,866	10,623	5,446	839,680	128	8.81	9.30	28,276	35,281	271	624	87
T	BSMMU	Dhaka	1,500	664,274	8,817	29,442			460	N/A	98	N/A	2.40	11,780	20,804	634	785	N/A
T	Chittagong MCH	Chittagong	1,010	527,130		127,612	6,754				187	5.40	5.30			173	228	15
T	MAG Osmani MCH	Sylhet	900	746,990	132,996	111,663	4,345	10,582	5,987	515,037	157	4.14	3.62	13,795	17,563	192	213	27
T	Rajshahi MCH	Rajshahi	530	560,628	117,979	123,417	5,104	9,992	3,624	460,202	238	4.60	4.14	9,715	5,121	214	344	43
T	Sher-e-Bangla MCH	Barisal	1,000	354,069	84,747	78,690	3,058	5,976	4,286	430,396	100	5.00	4.00	9,416	8,984	175	304	24
T	Rangpur MCH	Rangpur	1,000	237,733	3,544	89,379	4,198	6,667	2,974	439,264	120	4.90	4.60	7,769	12,426	31	342	24
T	Khulna MCH	Khulna	500	197,861	6,111	43,304	2,772	3,100	1,139	207,761	140	4.82	6.43	2,762	5,514	82	157	12
Sp	MCHTI	Dhaka	173			7,248		7,323	2,829									
Sp	ICMH	Dhaka	200	1,072,923	18,448	13,676	449	6,242	3,698	65,700	92	4.00	2.60	468	764	109	70	12
Sp	Dhaka Shishu Hospital	Dhaka	535															
Sp	Kurmitola GH (Specialized)	Dhaka	500													25	64	10
S	Narsingdi DH	Dhaka	100	114,744	42,519	6,935	153	678	146	25,390	70	4.00	3.00	379	544	15	40	3
S	Shahid Shamsuddin DH	Sylhet	100	119,277	1,829	2,649	0	47	36	23,717	65	9.33	0.00	362	243	0	45	2
S	Chittagong GH	Chittagong	250	145,592	10,157	9,830	66			62,096	68	6.30	0.70					
S	Manikganj DH	Dhaka	100	157,170	27,776	17,741	362	915	387	51,484	141	3.00	0.00	1,288	6,052	21	52	3
S	Gazipur DH	Dhaka	100	157,096	43,681	15,366	105	1,308	250	26,689	72	1.91	0.75	1,070	1,107	17	40	3
IG	Paba UHC	Rajshahi	31	88,534	2,308	1,894	1			6,543	58	4.00	0.05					

Source: Local Health Bulletins, MIS 2013



Reception of OPD for Male



Reception of OPD for Female



Inside of Reception



Ticket for Consultation



Reception of Radiology Dept. at Rajshahi MCH



Waiting Space for Ultrasound at Rajshahi MCH



Reception of Radiology Dept. at Dhaka MCH



Radiology Dept. at Sylhet MCH



Figure 4-1: Flow of Diagnosis and Treatment for Patients

### 4.1.3 Secondary Hospitals and Primary Health Facilities

#### (1) Organization

The difference of health facilities is the number of beds; more than 500 beds in MCHs, around 100 to 250 beds in DHs, 10 to 50 beds in Upazila Health Complex. CC provides only out-patient services. DHs are located at district level under the management by Civil Surgeon Office and provide more advanced health care than primary health facilities. DHs are usually termed secondary hospitals.

#### (2) Service hours

Generally, Out-patient Department opens 8:00 – 14:00 from Sunday to Thursday. Emergency Department of secondary hospitals accepts patients in 24 hours every day.

#### (3) Patient flow

Patient flow is same as MCHs, however, the capacity of secondary hospitals and primary facilities is much smaller than MCHs. Therefore, the flow is simpler than MCHs.

## 4.2 Maternal, Neonatal and Child Health

### 4.2.1 Situation of Emergency Obstetrics Care

Bangladesh is struggling to keep the sufficient numbers of obstetricians/gynecologists at medical facilities in rural areas. The vacant level of those doctors and anesthetists that are required for providing Basic Emergency Obstetrics Care (BEmOC) has been consistently high at more than 50%. WHO recommends Comprehensive Emergency Obstetric Care (CEmOC) should be available at the district and upper level of health care system and it should include caesarean section, safe blood transfusion and care to sick and low birth weight newborns, including resuscitation in addition to the Basic emergency obstetric care services. Although

HPNSDP 2011-16 has set increasing the number of CEmOC is one of the priority areas, there has not been much progress and only 75 facilities are capable of providing CEmOC services. The main barrier is contracting and retaining a pair of anesthetist and obstetrician. (APR2013)

#### 4.2.2 MNCH Services in Tertiary Hospitals

According to the Health Bulletin 2013 by MOHFW, MCHs account for 13.6% of total number of deliveries at public and private health facilities. 52.3% of the total number of delivery at MCHs are cesarean section cases.

Chittagong MCH accepts all referral cases for 24 hours even though the nurses and midwives are not allocated sufficiently. However, younger medical doctors support their work since the hospital is a teaching hospital. Therefore, the lack of staff is not as critical as that at DHs. Although Chittagong MCH is the top referral in the area, they cannot monitor postoperative patients due to the lack of monitors. 30 eclampsia cases within 60 maternal deaths occurred at the hospital in 2012. 300 eclampsia cases in a year are referred to the hospital and most of the eclampsia patients deliver by C-section immediately after referral.

The hospital provides “Screening Camp” for check-up of cervical cancer by VIA at the community level as an outreach service. After the camp, the number of patients to be checked by colposcopy increases at the hospital. For the positives at screening test of breast cancer by Clinical Breast Examination (CBE), the hospital can only provide diagnosis using echo, because there is no mammography.

Chittagong MCH has the largest Special Care Newborn Unit (SCANU) in Bangladesh with 80 beds and it is functioning.

BSMMU and Dhaka MCH have Newborn ICU to provide sick babies high technology healthcare. However, it is not easy to expand the special care service countrywide due to lack of qualified health staff. Newborn unit requires continuous presence of many health staff to supervise babies’ conditions and respond to them immediately.

#### 4.2.3 MNCH Services in Secondary Hospitals (Narsingdi DH and Chittagong General Hospital)

Narsingdi DH provides CEmOC service during working hours (8AM to 2PM), however the DH cannot provide the service at night time due to the lack of health staff.

Chittagong GH provides CEmOC service for 24 hours even though the facility and equipment are old. In order to provide EmOC service for 24 hours at Upazila level mentioned on OP1, the

secondary hospitals should be functioning for 24 hours. It is necessary to strengthen the EmOC facilities including operation theatre, laboratory, delivery room and newborn care unit as well as EmOC training for health staff.

#### 4.3 Health Facilities

The situation of medical health facilities and nursing colleges that were inspected in the field survey in Bangladesh are described below.

##### 4.3.1 Health Facilities

The design specifications for the facilities of MCHs are ranked as the superior level of 3 levels: standard, super and superior as defined by PWD/MOHPW. Therefore, almost the same specifications are applied to these hospitals in different years of establishment. For all seven (7) MCHs that were inspected in the field surveys, about 50 to 60 years had elapsed since their establishment and all were very much aged. They have been rehabilitated from time to time depending upon the functions of rooms and the level of deterioration. The rehabilitation works have been conducted by the PWD site offices in the premises of those hospitals. In recent years, there has been a large scale increase of beds at each MCH under the approval by MOHFW to the extent of expansion to 1,000-bed hospitals at 8 MCHs. Khulna MCH is the newest hospital with around twenty years history, thus they have been trying to extend their bed's capacity to one thousand same as other MCHs.

The main information and photos of rooms in visited 7 MCHs are shown in Annex 6. Visited MCHs are; Dhaka MCH, MAG Osmani MCH in Sylhet, Rajshahi MCH, Chittagong MCH, Rangpur MCH, Sher-e-Bangla MCH in Barisal and Khulna MCH. (No large differences in final specifications are seen before and after rehabilitation. Only the doors of MRI-installed rooms are provided with lead shields.)

The design specification for the facilities of DH is ranked as standard level. The present situations of secondary and primary facilities surveyed in the field survey are shown in Annex 7. Those facilities are following Health Care D1 Normal Medical Facilities under BNBC requirement.

##### 4.3.2 Hostels for Nursing Colleges and MCHs

The present situation of hostels for nursing colleges and MCHs was studied to assess the suitability and feasibility for Yen Loan support under HPNSDP2011-2016.

The hostels for medical students (including nursing students) provide a living space of about 2.4 to 4.0m by 3.3 to 4.0m for use by 2 students. It was confirmed that a set of toilet/washstand room is furnished in the living room for 2 students, or sets of toilet/washstand in a room is provided to about 20 students. The design of hostels of nursing colleges is made by HED under the control of MOHFW or DOA under the control of MOHPW. HED constructed the 5 stories hostels with the capacity of housing 500 persons for nursing colleges in Chittagong. A hostel for a nursing college in Khulna is under construction.

As an example of the hostels in Bangladesh, in addition to the hostel of Dhaka MCH whose present status is shown in the photos in Annex 8.

#### 4.4 Medical Equipment

##### 4.4.1 Overview of Tertiary Health Facilities

The medical equipment installed in tertiary health facilities, such as MCHs and the Paediatric Hospital, is mostly of the latest and most advanced models or equivalent and is being operated and utilized. There is sufficient number of staff for their operation and most of their advanced functions are being fully utilized. However, the numbers of equipment and facilities are insufficient for the number of patients. Because of the shortage of operating theatres, two operating tables are installed in a theatre so that two operations can be performed simultaneously. As it is impossible to perform all required imaging diagnostic and sample examinations with the equipment and facilities available in the Chittagong and Rajshahi MCHs, patients spend higher prices to receive diagnoses and examinations at private health facilities. While maintenance agreements have been concluded with agents for some of the expensive medical equipment, maintenance by agents of most of the other equipment ends when the product warranty period of one year expires. In this section, the current situation in all visited MCHs and BSMMU is described by department and section as overview of tertiary hospitals.

##### (1) Obstetrics and Gynaecology (Ob/Gyn) outpatient department

Equipment for obstetric and gynaecological examinations and colposcopy clinics is installed in the obstetrics and gynaecology outpatient departments.

There were multiple sets of gynaecological examination tables and operation lights with sets of examination apparatuses. In addition to colposcopes and other equipment for examinations, two gynaecologic cryosurgery systems, electrosurgical knives and a smoke evacuator for smoke generated by the knives were used. However, a large number of patients awaiting examination were forming long queues in all MCHs presumably because of the shortage of basic equipment.

Diagnostic ultrasound systems were not found in the Ob/Gyn outpatient department of any of the hospitals. Staff of the department expressed the need for such equipment for examinations.



Figure 4-2: Colposcopy Clinic in Chittagong MCH

## (2) Delivery rooms

A large number of normal deliveries are performed even in tertiary health facilities. Old and overused delivery tables, examination lights, vacuum extractors, and obstetric diagnostic ultrasound systems were found in most of the delivery rooms. Those medical equipment were used so frequently that there were cases, even in tertiary health facilities, where there was not enough time to sterilize medical instruments appropriately in the time- and labour-consuming way and, thus, the medical instruments were used again after being sterilized only by boiling.



Figure 4-3: Dhaka MCH (1)

## (3) Obstetric operating theatres

While some tertiary health facilities have operating theatres in the gynaecology department in addition to those in the operation department, one or two operating theatres in the operation department are designated for obstetric operations and used for operations including caesarean section in many tertiary health facilities. The obstetric operating theatres were found to be equipped with bipolar electrodes for electro-surgery and electrosurgical knives. As in the ordinary operating theatres, anaesthetic machines and monitors, operation lights and infant



warmers (neonatal treatment tables), as well as a video laparoscopic system, were found to be installed there. Even though expensive medical operating equipment is being used, operating apparatuses are washed in water boiled in a corner of the theatre and there is no clear demarcation between sterile and non-sterile areas. Tap water is stored in a tank and supplied to the hand washing apparatus. Presumably it is for a precautionary measure against interruption of water supply, but is not possible to assume as clean water required for operations.



Figure 4-4: BSMMU Hospital (1)

#### (4) Neonatal Intensive Care Units (NICUs) and Special Care Neonatal Units (SCANUs)

Existence of either an NICU or an SCANU or both in tertiary health facilities was observed as proof that neonatal care was prioritized. While nursing staff provide care for patients in NICUs, in principle, mothers care for their babies at their bedside in many of SCANUs in a system called “Kangaroo care”. Incubators are rarely used in neonatal care, presumably because of the lack of proper air-conditioning. Instead, care for neonates is provided on infant warmers (neonatal treatment tables) in most of the tertiary health facilities.



Figure 4-5: BSMMU Hospital (2)

There are many other pieces of high-grade medical equipment. There is a sufficient number of equipment, including two artificial respirators for children, four multi-function artificial



respirators, more than ten phototherapy systems, more than eight general monitors, more than five pulse-oximeters, many syringe pumps and one blood-gas analyzer.

A neonate was inside an old incubator in Sylhet MCH. (There was no water in the humidifier and its orifices to provide care were damaged). Two incubators were not in use.



Figure 4-6: Sylhet MCH

#### (5) Operating theatres

Although there is a disparity in their age and quality, required medical equipment is installed in operating theatres of all hospitals. However, the operating theatres are designed so that multiple operations can be performed simultaneously in a single theatre in order to perform a large number of operations in a limited number of theatres.



Figure 4-7: Rajshahi MCH

Operating theatres for pediatric cardiac surgery and CICUs attached to the theatres.

There are systems for operations of circulatory organs of children and postoperative care and one mobile X-ray machine.

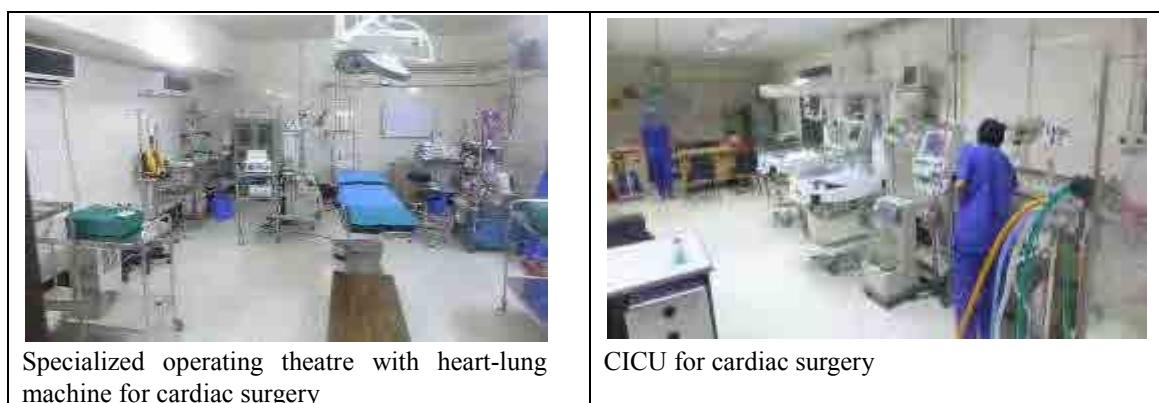


Figure 4-8: Dhaka Shishu Hospital (1)

#### (6) Paediatric catheter laboratory

The laboratory is fully equipped with equipment required for the latest cardiac angiography and treatment with catheters.



Figure 4-9: Dhaka Shishu Hospital (2)

#### (7) Radiology departments

As the radiology department is generally overcrowded and there is no pre-booking system, it is not able to deal with all the patients. Thus, we saw long queues of patients. An open MRI (with permanent magnet) and a CT (64 slices) in Dhaka MCH, in particular, are operated continuously. The agent of the equipment commented that current over used CT needed to change x-ray tube already 2 times in 3 years, so that the hospital required a five-year warranty instead of normal 1 year guarantee<sup>1</sup>. In many MCHs, one of the two CT systems was found to be out of order.

The radiology departments of tertiary health facilities have a total of four to eight radiography systems including those for fluoroscopic photography, plain radiography and mammography

<sup>1</sup> Guarantee is to certify performance in the specification. Warranty is to fix it (or contract) free of charge when they are faulty.

and mobile X-ray systems. Most of them are equipped with CR (computer radiography) systems. The price for MRI and CT examinations, local radiography and local ultrasonography are almost the same across public hospitals. In principle, photographs and films taken in examinations are to be handed over to the patients and patients are to take them home. Therefore, all the images taken with DR (digital radiography) have to be printed on films with a laser printer.



Figure 4-10: Dhaka MCH (2)

A large number of 4D color doppler ultrasound systems have been installed.



Figure 4-11: Dhaka MCH (3)

The numbers of imaging diagnostic of various types and cases of radiotherapy are shown in the following tables.

Table 4-2: Number of Imaging Diagnostic Examinations in Dhaka MCH

Year	2009	2010	2011	2012	2013
X-ray	63,546	64,563	67,584	70,560	73,500
MRI	1,795	1,756	1,987	2,156	2,200
CT	4,325	4,567	5,786	6,785	7,500
CAG, PTCA, PPM, PTMC	296	249	241	282	293
PAG	8	6	4	5	11
Mammography	-	-	2	72	41

USG	29,765	31,568	33,567	34,875	36,500
Video-Endoscopy	1,516	2,891	2,514	3,263	3,433
Colonoscopy	220	240	247	251	259
Radio-therapy	2,226	2,234	2,286	1,905	1,796

Source: Dhaka MCH (Statistics, Register)

CAG: Cardio Angiography and Coronary Angiography

PTCA: (Percutaneous Transluminal Coronary Angioplasty), PPM: (Permanent Pacemaker)

PTMC: (Percutaneous Transvenous mitral Commissurotomy), PAG: (Pelvic Angiography)

Table 4-3: Number of Imaging Diagnostic Examinations in BSMMU

Year	2007	2008	2009	2010	2011	2012	2013
X-ray	78,000	93,600	124,800	140,400	156,000	187,200	193,440
MRI							4,300
CT				12,845	13,056	13,500	14,200

Source: Mr. Abdul Mazid Medical Technologist

Table 4-4: Number of Imaging Diagnostic Examinations in Sylhet MCH

Year	2007	2008	2009	2010	2011	2012
X-ray	32,702	36,874	43,227	57,295	58,463	60,436
MRI	154	409	732	880	734	483
CT	497	2,076	2,647	264	2,508	5,027
Angiography	141	154	-	339	409	503
Ultra Sound Graphy	14,017	14,084	18,518	22,776	22,240	20,998
Video-Endoscopy	1,567	3,130	3,562	3,517	3,395	3,306

Source: Hospital statistics in Sylhet MAG Osmani MCH as of 24 April 2014

Table 4-5: Average Monthly Number of Imaging Diagnostic Examinations among 3 MCHs

Hospital	DMCH	BSMMU	SMCH
X-ray	4,899	13,364	4,284
MRI	191	358	54
CT	1,873	1,117	209
Angiography	24	-	23
Ultra Sound Graphy	5,297	-	1,688
Video-Endoscopy	247	-	282

(Average for 5 years Dhaka and BSMMU from 2009 to 2013, Sylhet from 2008 to 2012)

The number of examinations carried out at Dhaka MCH by one unit of CT (64-slice) is significantly greater than those done at the other MCHs by also one unit of CT. The unit delivered in 2011 is used for 24 hours a day and the tube has already been replaced twice. The number of radiographs taken at BSMMU is also significantly large. Assuming that the equipment are operated 30 day a month, 445 X-rays were taken every day by 4 machines ( $13364/30=445$ ) at BMMSU. This demands one X-ray machine to take more than 100 X-rays every day. This is 2 times as much as an average X-ray taken in a day at a district level

hospital in Japan. Likewise, MRI is also over used. Examination of 12 patients( $358/30=12$ ) by a single unit of MRI in a day is beyond the limit of its capacity.

#### (8) Examination of samples (Laboratories)

The laboratories in tertiary hospitals are divided by specialty, and biochemical, haematological, immunological, microbiological, parasitological, and pathological examinations are carried out in the subdivided laboratories. The areas of biochemistry, haematology and immunology are the main areas where specialised analytical equipment is used as medical equipment. Large automatic analyzers are found in those areas. Examination equipment is divided into equipment requiring use of bar-coded reagents, integral for accuracy control of examinations, and equipment which can be operated with non-specific open reagents. While High-grade equipment requiring use of specific reagents was operated in BSMMU in Dhaka Paediatric Hospital, equipment using open reagents was used in Dhaka MCH and Rajshahi MCH.

There are several large automatic serological analyzers of Abbott and Siemens for biochemical examination in BSMMU. The immunological examination and examinations of markers could be performed in the laboratory. Each department in the laboratory has the analytical equipment of the highest quality in Bangladesh. BSMMU has a laboratory of bio-safety level 3, in which viruses that i) cause critical diseases in people and animals, ii) will not be transmitted from one person to another under normal circumstances, and iii) can be cured or prevented through an established and effective method, can be handled.



Figure 4-12: BSMMU Hospital (3)

#### 4.4.2 Situation of Imaging Diagnostic Equipment in Tertiary Hospitals

This section describes the situation of medical equipment focusing on imaging diagnostic equipment in BSMMU, Rangpur MCH and Sher-e-Bangla MCH in Barisal, picked out from the visited tertiary hospitals.

(1) BSMMU

1) Cardio-surgery department

The survey is conducted to see how medical equipment is used in BSMMU Medical University. The Cardio-surgery Department is equipped with 4 angiography units. However, one of them is broken and difficult to repair so it needs to be replaced with a new unit. All equipment is single-plane equipment for the Cardio-surgery Department. The Cardio-surgery Department is located to pair up with the Coronary Care Unit (CCU). For patients who do not require intensive care provided in the CCU, medical wards called Hi Care Unit are available. They are equipped with medical equipment monitors, ultrasound, and other necessary equipment. The table below shows the number of tests performed on patients using equipment over the past five years in the cardiovascular department.

Table 4-6: Number of Patients for Angiography

No.	Equipment	2009	2010	2011	2012	2013
1	Angiogram	1,351	1,491	1,608	1,953	2,269
2	ECG	22,504	25,004	28,503	32,312	36,550
3	Echocardiogram	7,138	7,299	9,568	11,215	13,051
4	ETT	866	925	1,155	1,109	1,317
5	Holter				84	121



Cardiology Entrance



Angiography



Gastroenterology Entrance



Gastroscopy Set

Figure 4-13: Cardiology and Gastroenterology Departments



## 2) Endoscope room of the gastrointestinal department

As shown in the table of tests carried out using an endoscope below, tests are performed on many patients. However, only one gastroscope and colonoscope can be currently used. Although a request for the repair of two units each has been made, there is no prospect for them to be actually repaired. Since one endoscope is used to test many patients every day, the cleaning process after each test is extremely simplified which increases the risk of infection.

Table 4-7: Number of Patients for Endoscopy

No.	Equipment	2010	2011	2012	2013	2014 (Half year)
1	Gastrosocopy	1,422	1,660	1,710	1,823	1,020
2	Colonoscopy	441	560	480	510	258
3	Duodenoscopy	60	110	115	115	40
4	Total	1,923	2,330	2,305	2,448	1,318

## (2) Rangpur MCH

### 1) Radiography Department

According to the survey in the Radiography Department of Rangpur MCH, imaging diagnostic systems are used in the former Radiography Department and new Radiography Outpatient Department as described below.

#### Former Radiography Department

- Two units of digital bucky tables (universal type, units made by Philips and Kodak DR) and laser printer
- Two units of fluoroscopy tables (one is made in South Korea and the other one is made by Apelem in France). Fluoroscopy cannot be performed on either of them so only general radiography is performed.
- One MEDITRONIC bucky table (A Toshiba tube is used)
- Three mobile units are operated: one Philips India unit and two other units.
- CT scanner: SIEMENS single scan unit made in 2005 (broken for the past two years)
- MRI: Hitachi 0.3T permanent magnet made in 2007, operating
- Mammography: HOLOGIC unit (broken because of grid failure for the past two years)
- Ultrasonograph: An old Hitachi and Toshiba units are used.

#### New Radiography Outpatient Department

- LISTEN bucky table made in South Korea is used.
- LISTEN fluoroscopy table made in Korea is used for fixed radiography only. It is not used

as a fluoroscopy unit.

- CT: Philips 64-slice unit (2002) is used. A maintenance contract has been made.
- MRI: Philips superconductivity 1.5 T unit (2007) is used. A maintenance contract has been made.
- Although new Philips X-MATRIX ultrasound (4D) is available, it is not used.

There is no shielding for radioactive rays on the ceiling of the former Radiography Department or new Radiography Outpatient Department. The wall does not seem to shield rays sufficiently.

Table 4-8: Number of Patients for Imaging Diagnostic Equipment

No.	Equipment	2009	2010	2011	2012	2013
1	MRI	No data	1,368	1,872	2,244	1,890
2	CT scanner	“	2,664	Out of Order	5,028	5,592
3	General X-ray	“	36,240	33,852	35,058	36,198
4	USG	“	5,568	5,160	8,645	10,962
5	Mammography	Out of Order				



Figure 4-14: Medical Equipment at Rangpur MCH

## 2) Endoscope room of the gastrointestinal department

The Survey Team could not observe the endoscope room due to a time issue. The team obtained



data on the use of the equipment as shown below. The department has one unit each of Fujinon and a Pentax gastro scope, as well as one each of a Fujinon and Pentax colonoscopy unit which were all made in 2013. Just like BSMMU, one unit of equipment is used to test many patients as shown in the table below. The cleaning process after each test is simplified which increases the risk of infection.

Table 4-9: Types of Tests Performed in 2013

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Total
1	Gastroscopy	Gastritis	PUD	Varices	Ca. Stomach	Ca. Esophagus	
		824	550	150	74	50	1648
2	Colonoscopy	Hemorrhoid	Ulcer, Erythema	Ca. Colon	IBD	Polyp	
		94	70	54	43	43	304
3	Duodenoscopy	ERCP					
		01					01

### (3) Sher-e Bangla MCH in Barisal

The team surveyed the conditions of medical equipment mainly in the Radiography Department of Sher-e-Bangla MCH. The team assessed the condition of each piece of equipment with explanation provided by the radiologist and checked the location where imaging diagnostic instruments were installed. Because many pieces of radiological equipment could not be installed in the former Radiography Department on the second floor, Philips 64-slice CT scanner made in China, which the college started to use recently, was installed at the entrance of the Orthopedic Department and a Hitachi 0.3 tesla permanent magnet MRI unit (currently out of order) was installed along the side of a hall that does not belong to any department downstairs.

#### 1) Radiography department

(located on the second floor with insufficient shielding for radioactive rays for upper and lower floors)

- Although there were six ultrasound units, they were all out of order. The Fukuda Denshi equipment, that the hospital purchased using its own budget, broke recently. The hospital was waiting for the distributor to repair it.
- There were two units of fluoroscopy tables. (A SIEMENS unit made in China with Fuji Film CR system was installed. Bucky and mobile systems were used for CR. An Apelem unit made in France was also installed.) Both of them were broken and out of order.
- An extremely old MEDICOR bucky table made in Hungary (with a SIEMENS tube) was operating and was used for tests.
- There are four mobile units but three units were out of order. Only one mobile was using now.

- CT scanner: SIEMENS spinal single scan unit is used.
- MRI: Hitachi 0.3T permanent magnet unit made in 2007 is out of order. The Survey Team contacted the distributor and they said even though a quotation for repair has been issued, budget for the repair has not been secured.

## 2) Orthopedic Outpatient Department

- CT: Philips 64-slice unit is used. A maintenance contract has been made.
- Cardio-surgery Department
- Angiography: Under an installation work of a Philips single-plane unit

The table below shows the number of patients in the Radiography Department of Barisal MCH by the equipment used. MRI unit broke approximately three months ago. Although a request to order repair parts has been made, the time that will take to repair the unit is still unknown. Even though the college has six ultrasound units, five of them were broken and the last unit broke approximately four months ago. Therefore, the Radiography Department currently cannot perform tests using ultrasound. The greatest problem in the administration of medical equipment at each MCH is that an approval to repair broken equipment takes an extremely long time, making it impossible to perform medical tests for long periods of time. Under these conditions, the impaired functions of a hospital cannot adequately be recovered. (When tests cannot be performed at MCHs, patients can take an MRI or ultrasound test at private hospitals in Barisal City though fees are several times higher.)

Table 4-10: Number of Patients

No.	Equipment	2010	2011	2012	2013	Remarks
1	MRI			130	140	Nonfunctioning for last 3 months
2	CT Scan	4,268	4,400	4,780	5,029	
3	General X-Ray	33,110	33,340	35,360	37,000	
4	USG	5,098	5,894	6,087	4,960	Nonfunctioning for last 4 months



Entrance of Barisal MCH



CT & Monitor with Medium Injection



Figure 4-15: Medical Equipment at Barisal MCH

### 3) Endoscope room of the gastrointestinal department

The Survey Team received explanation about conditions of equipment from a professor of the Medicine Department. A Pentax video gastroscope and two units of colonoscopes were used. After the gastro camera was used, staff quickly washed and disinfected it in a bucket with a disinfectant solution on the spot and used it for the next patient. (It was clear that the camera was not cleaned and disinfected sufficiently.) Although the colonoscope monitor was out of order, images could be viewed using the console computer.

The Survey Team asked the professor about facilities necessary for future medical treatment using endoscopes and received the following answers.

- a) Room for preparation of patients (two beds for caring patients before treatment and related equipment and goods)
- b) Room for monitoring patients after treatment (room where patients can recover after treatment with two beds and related equipment and goods)
- c) Gastroscope test room
- d) Colonoscope test room
- e) ERCP room (C-arm radiological instrument, radiation shielding room, and endoscope set)
- f) Fibroscan room (The hospital has two ultrasound units for liver.)
- g) Room for doctors and nurses
- h) Storage room

#### 4.4.3 Overview of Visited Secondary Hospitals

DHs are classified as secondary health facilities. They are operated under the supervision of Civil Surgeons of the districts in which they are located. The Survey Team visited 3 Secondary Hospitals for understanding of current situation of secondary hospitals as overview to consider UHC and utilization of Japanese technology. The visited hospitals are; Narsingdi DH where a

technical cooperation project on maternal and child health of JICA was being implemented, Chittagong General Hospital (GH) and Shahid Shamsuddin DH in Sylhet.

It appeared that the power supply was unstable at all the DHs. This unstable power supply could have been a cause of breakdown of equipment. To prevent malfunction, major medical equipment was observed to be equipped with devices to stabilize power supply such as AVR (auto voltage regulator) or simple UPS (uninterruptible power supply) called IPS (Instant Power System).



Figure 4-16: Equipment for Stable Power Supply at a DH



Figure 4-17: Medical Equipment at the DH Level

The condition of secondary hospitals varies a great deal in the scale for facilities such as the number of beds and equipment installed. While Chittagong GH is equipped with latest digital radiography systems, equipment in unusable condition and old equipment were found in other DHs.



Figure 4-18: Medical Equipment for Radiology at a DH

Requests for the repair of broken-down medical equipment is submitted from a hospital to the Director General through a district health office and the DH. The hospital requests NEMEW to examine the condition of broken-down equipment. After the examination, a request for repair estimation is sent to an equipment agent. As this process requires a long period of time, it is very difficult to repair broken-down equipment. Civil Surgeon Offices are supposed to have a budget for repairing equipment, however, the amount is not sufficient and the budget tends to be used for other expenses.

The team was also informed that no equipment considered as assets including medical equipment had been disposed of for 14 years. From this information it can be inferred that it is very difficult to dispose of such equipment.

#### 4.4.4 Secondary Hospitals Visited for Collaboration with the Yen Loan Project Phase 1

The Yen Loan Project Phase 1 supports the expansion to increase the hospital beds of 6 DHs. In Phase 2, assistance to provide medical equipment for the six DHs would be considered. Based on the plan to increase the number of beds from 100 to 250, construction work is now being carried out at four of the six hospitals which are: Manikganj, Munishiganj, Baruguna, and Bargerhat DHs. Gazipur DH was upgraded to a Medical College because it now has 500 beds instead of 100. The college is already providing medical education for its first students and construction work at the hospital is also progressing. At Satkhira DH, construction work has begun only on its operation ward. Manikganj DH was upgraded to a Medical College just like Gazipur DH.

Therefore, healthcare services in Manikganj DH and Gazipur DH would be expanded as well as the services provided at tertiary hospitals, if they follow the tertiary hospital standard in Bangladesh. Since funds to supply medical equipment to these DHs to be secured, the team surveyed these two hospitals near Dhaka city; Manikganj DH and Gazipur DH. The detailed

results of the field survey at 2 DHs below are available in Annex 9.

#### (1) Manikganj DH

The DH and Civil Surgeon Office are located in Manikganj district, a suburb of Dhaka, where the opening of a number of textile factories has increased the population. The team visited the radiology department, laboratory and operating theater to study medical equipment situation.

The Manikganj DH formerly had a plan to increase its number of beds to 250 and that it has been decided to increase the number of beds to 500 and open a new Medical College. Thus, their request for equipment is the standards of MOHFW regarding hospitals with 500 beds.

In the radiography department, a fluoroscopy X-ray system installed at this hospital was purchased in 1985 through a Japan's grant aid. Because the system is broken, it was later used as a bucky table for a mobile X-ray system. One unit of the new ultrasound apparatus is used at that time. The laboratory had simplified testing equipment for manual tests such as a calorie meter, microscope, and centrifuge. For providing speedy and accurate diagnosis to the large number of patients, the equipment such as the X-ray equipment would be necessary. The Operation Department was equipped with a C-Arm X-ray system and electrosurgical unit, artificial respirators, a laparoscope set, and an operation table and light, which were different country products and seemed sufficient to perform operations. However, the operation room, in which many of the new medical equipment pieces are installed, is very small, so that there is not sufficient space to perform operations.



Hospital Entrance



Construction of a New Hospital





Broken Fluoroscopy Table Used for Mobile X-ray

Hospital Crowded with Patients

Figure 4-19: Manikganj DH

## (2) Gazipur DH

The Civil Surgeon Office and the DH in Gazipur are located near Dhaka city and have many factories and an increasing population. The team visited the radiology department, laboratory and operating theater to study medical equipment situation.

At Gazipur DH, construction work that will allow for an increase in the number of beds to 500 is being carried out through the Yen Loan Project Phase 1. According to the Manager of the Civil Surgeon Office, the foundation construction has almost been completed and the construction will be finished within the next two years.



Hospital Entrance

Hospital Construction & Medical College Building

2 Operation Tables in 1 Operation Room

Medical College Students

Figure 4-20: Gazipur DH

Renovation work was being carried out in the radiography department of the hospital. Its general X-ray system was broken so the staff was performing radiography with only a mobile X-ray system. A new-model ultrasound was being used in an air-conditioned room.

For laboratory equipment, simplified testing equipment for manual tests such as a calorie meter, microscope, and centrifuge were being used.

The operation theatre was equipped with a lot of medical equipment, including a German laparoscope set and a Chinese operation table and light which seemed sufficient to perform operations. According to the staff, they have two operating tables in one operation room so they can perform two operations at the same time. This allows them to perform more operations.

#### 4.4.5 Skill Laboratory Equipment in Nursing Colleges

The Survey Team visited to study the actual situation of skill lab and equipment in the Nursing Colleges of BSMMU, Rangpur, Barisal and Dhaka. Required number of skill laboratories varies in some nursing colleges. Some requires more than ten, while some others do not require, for example, English lab as one laboratory. However, majority of the nursing colleges require at least following 7 laboratories for practical nursing training and required educational and medical equipment as shown in Table 4-11.

Table 4-11: Type of Skill Laboratories and Requirement of Equipment

No	Type of Lab	Equipment
1	Nutrition and Diet	Food model, Nutrition chart, Balance, etc.
2	Microbiology	Microscopes, staining slid kits, chart, sterilizer, etc.
3	Fundamental Nursing	Doll adult and child, Bed, sphygmomanometers, etc.
4	Anatomy	Real Skull and body parts model, chart, etc.
5	Physiology	Model(human skeleton with nerves and blood vessels) chart, etc.
6	Computer	Desktop Computers, Internet network connection, projector, etc.
7	Midwifery	Doll and simulator for delivery and pediatric, etc.

Additionally one of skill lab is English study and practice

##### (1) Faculty of Nursing, BSMMU

Faculty of Nursing, BSMMU has two skill laboratory rooms separated in different buildings. The room named the Robi Nursing Skill Laboratory shown in the photo was equipped with simulation models such as a human body model for bedside care and an artificial hand for IV cannulation; basic medical equipment such as a weighing machine, electric suction machine, and sphygmomanometers; and models for explaining human body functions, including a human skeleton with nerves and blood vessels and unisex torso parts. All of practical lesson for skill lab is implemented in this room now. The library was equipped with textbooks, real human bones,



human body parts models, and vegetable and food models.



Figure 4-21: Faculty of Nursing, BSMMU

## (2) Rangpur Nursing College

At Rangpur Nursing College, skill laboratory exercises in the following eight fields.

- a) English Laboratory
- b) Nutrition and Diet Laboratory
- c) Microbiology Laboratory
- d) Fundamental Nursing Laboratory
- e) Anatomy Laboratory
- f) Physiology Laboratory
- g) Computer Laboratory
- g) Midwifery Laboratory

The college is currently examining whether or not to provide the following three skill laboratory training courses in addition to the 8 laboratories above : Medical & surgical, pediatric, orthopedic training courses

The following skill laboratory rooms are equipped with specialty skill laboratory equipment.

There are approximately 100 students in each class. They are divided in four classes and 25 students in each class are divided into four groups for practical trainings.

- a) Nutrition and Diet Laboratory (Vegetables model)
- b) Microbiology Laboratory (Doll adult and child)
- c) Fundamental Nursing Laboratory (4 Microscopes and staining slid kits)
- d) Computer Laboratory (13 Desktop Computers, Microsoft Windows 7, Office Word, Excel, PowerPoint, Internet Web and E-mail)
- e) Midwifery Laboratory (Doll for delivery and pediatric supply from the Department of Foreign Affairs, Trade and Development, Canada DFATD)



Figure 4-22: Rangpur Nursing College

### (3) Barisal Nursing College

Currently, in Barisal Nursing College, skill laboratory exercises in the following seven fields are provided by specially trained teachers; Nutrition & Diet , Microbiology, Fundamental Nursing, Anatomy, Physiology, Computer and Midwifery.

The college currently has the following specialty laboratories. Anatomy and Physiology have a storage to store the materials. To perform laboratory work, 86 students in a class are divided in

ten groups of eight to ten members,

- a) Nutrition and Diet Laboratory (Vegetables model)
- b) Microbiology Laboratory (4 Microscopes and staining slid kits)
- c) Fundamental Nursing Laboratory (Doll adult and child)
- d) Computer Laboratory (15 Desktop Computer, Microsoft Windows 7, Office Word, Excel, PowerPoint, Photoshop). There is no internal LAN or internet access.
- e) Midwifery (Doll for delivery and pediatric supply)



Figure 4-23: Barisal Nursing College

#### (4) Dhaka Nursing College

At Dhaka Nursing College, skill laboratory exercises in the following seven fields; Nutrition & Diet, Microbiology, Fundamental Nursing, Anatomy, Physiology, Computer and Midwifery.

The college currently has the following special laboratories which are located separately within the campus. Although the Fundamental Nursing Laboratory, Computer Laboratory, and Midwifery Laboratory have sufficient space, the Nutrition and Diet Laboratory, Microbiology Laboratory, and Anatomy Laboratory share one space. The college is equipped with most basic skill laboratory equipment. However, microscopes and some items are old and need to be

replaced with newer models.

- a) Fundamental Nursing Laboratory (Doll adult and child)
- b) Computer Laboratory (20 Desktop Computer, Microsoft Windows 7, Office Word, Excel, PowerPoint, Photoshop) Just like other nursing colleges, there is no internal LAN or internet access.
- c) Midwifery Laboratory (Doll for delivery and pediatric supply)
- d) Nutrition and Diet Laboratory (Vegetables model)
- e) Microbiology Laboratory (Three old microscopes and slide staining kits)
- f) Anatomy Laboratory (Real Skull and body parts model)



Figure 4-24: Dhaka Nursing College

#### (5) Skill lab space in the Each Nursing College

The Survey Team confirmed following skill lab space in the 4 nursing colleges.

Table 4-12: Available Space of Skill Laboratories in the Following Nursing Colleges

No	Space of Skill Lab	BSMMU	Rangpur	Barisal	Dhaka
1	Nutrition and Diet		○	○	△
2	Microbiology		○	○	△
3	Fundamental Nursing	○	○	○	○
4	Anatomy		○	○	△



5	Physiology		○	○	○
6	Computer		○	○	○
7	Midwifery		○	○	○

○ : Room or enough space available, △: Not enough space, No mark: No space

(Dhaka Nursing College has new additional building including new skill Lab space whose purpose of function is not yet determined)

#### (6) Equipment of skill lab in the each nursing college

The Survey Team studied the equipment situation in the 4 nursing colleges and basic requirement of each skill lab equipment.

Table 4-13: Equipment of Skill Laboratories in the Following Nursing Colleges

No	Space of Skill Lab	BSMMU	Rangpur	Barisal	Dhaka
1	Nutrition and Diet	△	○	○	○
2	Microbiology		○	○	△
3	Fundamental Nursing	○	△	△	△
4	Anatomy	○	○	○	○
5	Physiology	△	△	△	△
6	Computer		○	△	△
7	Midwifery		△	△	△

○ : Almost enough equipment, △: Old or missing and required equipment, No mark: No equipment.

(Basically the fundamental nursing and midwifery skill lab equipment has a limited life time equipment. They need occasional replacement. 5 years: Microbiology, Fundamental Nursing, Computer, Midwifery. 10 years: Nutrition and Diet, Anatomy, Physiology.)

Basic education equipment and business machines for administrative work were missing at all nursing colleges visited. Those equipment are essential for school of nursing college.

### 4.5 Human Resources for Health (HRH)

#### 4.5.1 Current Situation of HRH

As stated in chapter 1, the Survey Team roughly set the targets, focusing on diagnostic services. With a view to activities for HRH beyond HPNSDP 2011-2016, surveys placed emphasis on the department of radiology and internal medicine (especially cardiovascular medicine and gastrointestinal medicine) at MCHs along with the statistical data collection for HRH.

#### (1) Statistical overview

The following table indicates that a big number (30-40%) of all types of health personnel in seven divisions is concentrated in Dhaka. Among seven divisions except Dhaka, Barisal and Sylhet divisions have less number of health personnel while there is bigger number in Chittagong and Rajshahi compared to other divisions.

Table 4-14: Divisional Distribution of HRH Working under DGHS, DGFP &amp; DNS of MOHFW

Professionals		Total	Barishal 8,325,666 (Population)	Chittagong 28,423,019	Dhaka 47,424,418	Khulna 15,687,759	Rajshahi 18,484,858	Rangpur 15,787,758	Sylhet 9,910,219
Medical Practitioners	All MBBS Doctors	16977	1002 (6%)	2796 (17%)	7133 (42%)	1531 (9%)	2006 (12%)	1489 (9%)	1020 (6%)
	SACMO	6651	480 (7%)	1377 (21%)	1985 (30%)	965 (15%)	862 (13%)	597 (9%)	385 (6%)
Pharmacist		3008	192 (6%)	351 (12%)	1116 (37%)	288 (10%)	546 (18%)	345 (11%)	196 (7%)
Medical Technologists (3909)	Medical Tech.-Lab	1623	90 (5.54%)	254 (16%)	679 (42%)	142 (9%)	242 (15%)	141 (9%)	75 (5%)
	Medical Tech.-Radiog	635	44 (7%)	96 (15%)	211 (33%)	70 (11%)	107 (17%)	71 (11%)	36 (6%)
	Medical Tech. (Physiotherapy)	147	13	32	47	15	20	13	7
	Medical Tech. (Radiotherapy)	38	3	2	21	0	4	4	4
	Medical Tech. (Dental)	494	38	89	144	60	71	58	34
	Medical Tech. (BCG/EPI)	467	40	94	123	58	63	55	34
	Medical Tech. (S.I)	438	37	57	134	57	64	57	32
	Medical Tech. (Others)	67	2	11	48	2	0	2	2
Non Medical PH Practitioners (68096)	HA	19278	1669	3869	5500	2157	2531	2080	1472
	Health Inspector	1131	104	212	321	127	166	139	62
	Assistant H Inspector	3663	355	810	963	436	466	410	223
	Family P Assistant	1253	104	262	321	153	170	150	93
	FFPI	3549	304	711	985	464	427	400	258
	FWV	5172	370	1107	1471	656	628	580	360
	Asst Nursing Attendant	52	5	9	14	9	6	6	3
	Female Medical Attendant	63	6	11	16	10	8	8	4
	FWA	21113	1671	4048	6018	2646	2739	2525	1466
	CHCP	12822	981	2369	3541	1590	1846	1702	793
Nursing Practitioners (17131)	Nursing & Deputy Superintendent	97	5	17	40	9	10	8	6
	Nursing Supervisor	959	72	134	373	86	132	94	68
	Sr. Staff Nurse & Staff Nurse	14509	953	2269	5917	1412	1952	1094	912
	PH Nurse	4	-	2	-	1	1	-	-
	Nurse/Assistant Nurse	1564	108	226	662	134	226	134	74

Source: HRM Unit (2013), "HRH Country Profile Bangladesh", Human Resources Management Unit, MOHFW

In addition, according to Bangladesh Health Facility Survey 2011 (BHFS), the shortage of health workforce is obvious as the following table shows that almost all medical facilities do not meet their quota authorized by the GOB.

Table 4-15: Numbers of Health Professional Posted (Percentage of Posts Filled) According to Medical Facilities

Numbers of Health Professional Posted (Percentage of Posts Filled)	DHs	UHCs	MCWCs	UHFwCs	USCs
Specialized doctor (%)	480 (58.9%)	1,507 (48.3%)			
General doctor (%)	650 (56.2%)	2,065 (75.1%)	169 (80.1%)	410 (20.7%)	621 (67.6%)
Nurse (%)	2,225 (85.9%)	3,942 (78.2%)	98 (62.4%)	-	-
Mid-wife (%)	-	3,740 (99.7%)	-	-	-
Paramedical (%)	207 (83.47%)	230 (57.8%)	46 (93.9%)	322 (15.2%)	423 (46.48%)
Nursing associate (%)	263 (64.5%)	160 (37.6%)	-	-	-
Community Health Worker (%)	0	4,095 (73.7%)	455 (97.6%)	4,710 (79.8%)	1,352 (87.7%)

Source: Bangladesh Health Facility Survey 2011

Furthermore, imbalanced sex distribution of major HRH throughout Bangladesh is obvious as the following figure 4-25 represents. For example, medical practitioners including MBBS doctors and medical assistant are male dominant as 70% are male and 30% are female. Nurses and midwives are mostly dominated by female while the jobs of medical technologist and

alternative medicine practitioner are male dominant.

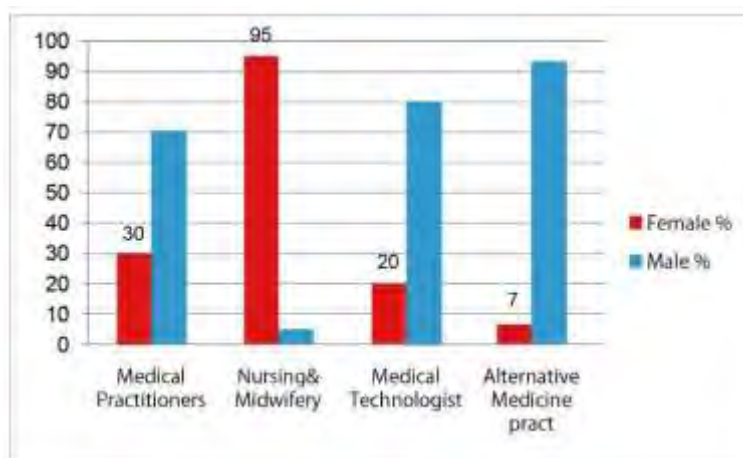


Figure 4-25: Sex Distribution of HRH in 2012

Source: HRM Unit (2013), “HRH Country Profile Bangladesh”, Human Resources Management Unit, MOHFW

As shown in the statistical data above and stated as challenges in many development reports, there are many urgent issues in the aspect of HRH such as the absolute shortage, skill-mix imbalance, mal-distribution<sup>2</sup> in terms of division and sex, and the lack of their clinical knowledge and skills.

## (2) Radiology department

In the Radiology Department, except some MCHs, there is usually a professor, associate and assistant professor, general radiologist, resident and intern doctors, all of whom use imaging technologies such as X-ray radiography, ultrasound, CT, nuclear medicine, positron emission tomography (PET) and MRI to diagnose or treat patients. Resident doctors at Radiology Department learn about the following items; interpreting radiograms, making reports about interpretation, history taking of patients including counseling, contrasting, and operating medical equipment such as ultrasound apparatus, CT scanner, MRI and X-ray while intern doctors spend 1 week at the department for learning.

In addition to radiologists, there are also medical technologists in the department; 1) active technologist with diploma in medical technology and 2) intern technologist. In fact, it is observed from the survey that almost half of the intern technologists at surveyed MCHs were female students. However, female technologists do not work at public hospitals in Bangladesh since not so many posts are prepared by the GOB so they mostly work at private hospitals. As a matter of fact, there was 1 female technologist only at Sher-e Bangla MCH Barisal. It is also

<sup>2</sup> The majority of qualified providers, however, are located in urban areas. Basically, medical staff themselves are not so motivated to work at grass-root level due to the lack of financial incentive.

observed that technologists usually operates the same equipment for a long time at many MCHs except Dhaka MCH.

The Survey Team conducted a questionnaire survey intended for all radiologists at surveyed MCHs. The following table 4-16 is the data of all radiologists and medical technologist working at surveyed MCHs.

Table 4-16: List of Radiologists and Medical Technologists of Surveyed MCHs

(1) <u>Radiologist</u> (2) <u>Medical Technologist</u> (Radiographer)			Dhaka MCH (2,400 beds)		Chittagong MCH (1,010 beds)		Sher-e Bangla MCH Barisal (1,000 beds)		Rangpur MCH (1,000 beds)		Rajshahi MCH (530 beds)		MAG Osmani MCH Sylhet (900 beds)		Khulna MCH (500 beds)	
			(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
a	Total number (Female)		25 (9)	22 (0)	8 (3)	10 (0)	7 (3)	8 (1)	8 (4)	9 (0)	10 (1)	10 (0)	7 (0)	9 (0)	5 (1)	4 (0)
b	Average age		41	45	41	47	44	44	41	49	41	43	47	44	43	41
	Age range (youngest - oldest)		30-53	35-55	33-51	44-56	31-53	34-54	32-58	42-58	32-55	35-46	38-54	34-57	40-45	34-45
c	Number of staff with personal training experience	Yes	6	16	1	7	4	7	4	8	1	9	3	7	0	4
		No	7	6	7	3	3	1	4	1	0	1	4	0	2	0
		N/A	11	0	0	0	0	0	0	0	7	0	0	2	0	0
d	Type of training or workshop experience	MRI	0	9	1	7	3	2	2	3	1	9	2	5	0	3
		CT	0	12	0	7	2	4	2	1	0	9	2	4	0	3
		Angio	0	0	0	2	0	3	0	0	0	0	0	3	0	0
		Others	5	9	1	5	0	0	1	0	0	0	2	4	0	4
		N/A	1	0	0	0	0	0	0	0	7	0	0	2	0	0
e	Average age of receiving training		35	37	32	42	48	42	40	40	-	-	40	36	0	35

Source: Prepared by the Survey Team

### 1) Number of radiologists and technologists

The number of radiologists at Dhaka MCH is almost as twice or three times as many as those at other MCHs, and Khulna MCH seems to obviously face a severe shortage of staff. However, it can be considered that gender balance of the staff is retained in 5 MCHs out of 7. The data above shows that Dhaka MCH has the biggest number of technologists while Khulna MCH has the lowest. Although on average, 9-10 technologists work at each hospital, the shortage of technologists has been a severe challenge in Bangladesh. It has been observed from the survey that technologists work shifts at all surveyed MCHs; 1) 8:00-14:00, 2) 14:00-20:00 and 3) 20:00-8:00AM. For example, at Sher-e Bangla MCH, 5 technologists from 8:00 to 14:00, 1 from 14:00 to 20:00, and 1 from 20:00 to 8:00 are on duty, and 1 is off duty. At MCHs where the lack of human resource is noticeable, each person's workload and their burdens due to their colleague's absence were severe.

### 2) Average age, age range, and average age of receiving training



Average age of radiologists is commonly in the forties at all MCHs while age range from the youngest to the oldest is from thirties to fifties in almost all MCHs. Regarding technologists, at all MCHs, average age is commonly in their forties. Age range differs from MCH to MCH but youngest is usually in their late thirties while oldest is in their fifties.

“Average age of receiving training” means the age when they received it, and the case of Chittagong MCH shows the youngest age while it is the oldest at Sher-e Bangla Barisal. However, it can be inferred that in most cases, radiologists who are in their thirties and forties are more likely to be selected and take part in a training or workshop, which means too young and too old people are not selected as trainees. Like the case of radiologists, technologists in their thirties and forties are also more likely to be selected and take part in a training session or workshop but their average age of receiving training is younger than that of radiologists.

### 3) Number of staff with personal training experience

It is observed that not all but almost half of radiologists who answered questions of many MCHs like Dhaka, Sher-e Bangla Barisal, Rangpur, and MAG Osmani Sylhet have experience of participating in a training session or workshop. As for technologist, most of them have taken part in training at all MCHs. However, almost all of them have participated in local trainings held by donor agencies and foreign enterprises for short-term period (1 or 2 weeks) or overseas trainings in India, Australia, Japan and so on held by medical equipment makers/companies and donor agencies over a medium to long-term period (from 1 month to 1 year). This is because there are not so many trainings for medical technologists organized by the GOB. It was observed from the interview that medical technologists in late thirties and forties who are selected as training participants are usually not so familiar with computer and new technology.

### 4) Type of training and workshop experience

There are many radiologists with experience of receiving MRI workshop, and then CT. However, according to the interview, some participated in a seminar containing MRI and CT as one pair so they are also counted respectively in the Table 4-16. Like the data of radiologists, training sessions/workshops on MRI and CT are taken by many technologists even though some seminars contain MRI and CT as one pair so they are also counted respectively in the table above (Table:4-16). In addition, operating angiography will be a key subject for technologists to learn more about.

### 5) Instruction system inside the department

<Intern doctors and resident doctors>



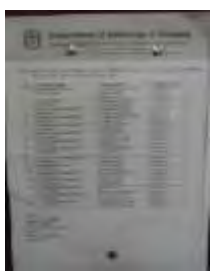
Major responsibility for instructing intern doctor is entrusted to registered doctors while

professors also teach them as necessary. Resident doctors are usually given instructions mainly by professors including assistant and associate professors, especially at large MCHs such as BSMMU and Dhaka MCH, but not at MCH where professors are not posted. Basically at all surveyed MCHs, one instructor teaches a small group (2 to 3 resident doctors) but the interpretation of radiograms is usually taught in a bigger group (at least 3 to at most 10 resident doctors). In addition, use of ultrasound apparatus is instructed to them with a constant attendance by professors and experienced registered doctors.

Evaluation of interns and resident doctors is done on the basis of the daily continuous assessment while resident doctors are supposed to take both theoretical and practical exams in the first, third, and fifth year. According to the survey result, the educational policy of BSMMU is that intern/resident doctors should absorb various ideas from as many instructors as possible. For instance, one instructor is responsible for teaching the same students only for one month by referring to one topic in a week. Moreover, it is observed that there is ward round held every morning among professors, resident doctors and intern students for exchanging views and sharing information about daily health care-service.

#### <Intern technologists>

There are neither many study sessions nor enough information sharing among technologists at the surveyed MCHs. Training inside hospitals to gain new technical knowledge and skill seems not organized systematically. As for the instruction for intern, a registered technologist gives instruction to one group (4 - 5 interns) about each item of equipment for a selected time period with a constant attendance<sup>3</sup> from the beginning to the end of training period. However, the survey reveals that the way of instruction is fully dependent on each instructor because of the lack of particular/specific curriculum and systematic teaching method inside the hospital.

		
Instruction of ultrasound examination (Rangpur MCH)	Interpretation of radiograms by resident doctors (Barishal MCH)	Table of instructors' work shift (BSMMU)

<sup>3</sup> The team observed that one instructor taught more than 10 trainees about one item of equipment at Rangpur MCH.

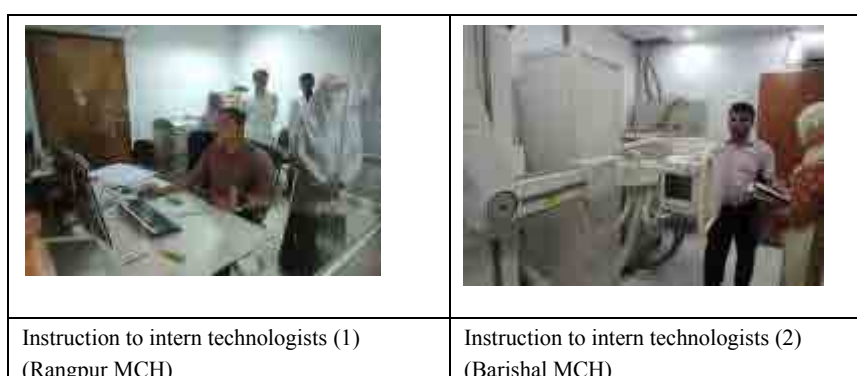


Figure 4-26: Instruction

Evaluation is often done differently according to instructors as some of them adopt theoretical and practical based evaluation<sup>4</sup> once every 2 weeks while others evaluate interns through their oral presentation and practice. For example, it was observed that instructors at Rangpur and Sher-e Bangla MCH Barisal prepare common questions and exams which have been prepared by respective hospitals, but there is no specific method of evaluation due to the absence of adequate curriculum inside the hospital. Continuous assessment on students' regular small exams is particularly dependent on each instructor. To make matters worse, some did not do any evaluation for students at both MCHs.

Moreover, the lack of sufficient communication and coordination for teaching students not only among instructors but also between instructors and the IHT seemed severe. IHT's roles are only to send a letter in which the list of trainees is written to the hospitals willing to accept them and to collect the evaluation sheet made by training sides. Progress situation of intern students is inspected by IHT but the quality of training is not monitored.

### (3) Internal medicine -cardiovascular medicine and gastrointestinal medicine-

The team conducted a questionnaire survey intended for cardiologists and gastroenterologists at surveyed MCH as the following table 4-17 represents. However, in the survey, due to the time limitation, information about the age and training experience only for Dhaka MCH has been acquired.

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<sup>4</sup> It was observed that some instructors regarded half of the total marks as "passed" while others thought 40 % was enough for passing.

Table 4-17: List of Cardiologists and Gastroenterologists Surveyed MCHs

(1) <u>Cardiologist</u> (2) <u>Gastroenterologist</u>		Dhaka MCH (2,400 beds)		Chittagong MCH (1,010 beds)		Sher-e Bangla MCH Barisal (1,000 beds)		Rangpur MCH (1,000 beds)		Rajshahi MCH (530 beds)		MAG Osmani MCH Sylhet (900 beds)		Khulna MCH (500 beds)	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
a	Total number performing as diagnostic (Female)	6 (0)	13 (0)	3 (0)	6 (0)	2 (0)	1 (0)	2 (0)	2 (0)	4 (0)	2 (0)	3 (0)	4 (0)	1 (0)	1 (0)
	Total number performing as intervention (Female)	3 (0)		1 (0)		1 (0)		1 (0)		1 (0)		1 (0)		0	
b	Average age	43	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Age range (youngest - oldest)	35-52	35-50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
c	Number of staff with personal training experience	Yes	0	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		No	6	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Prepared by the Survey Team

### 1) Number of cardiologists and gastroenterologists

Since cardiologists and some radiologists<sup>5</sup> perform as diagnostic part, the total number of staff include both of them. In the meantime, intervention is performed only by cardiologists. From the data above, on average, there are only 2-4 cardiologists and radiologists performing as diagnostic part at all MCHs while there is only one cardiologist who perform as intervention part. As for gastroenterologists, Dhaka MCH has the biggest number and Chittagong MCH has the second but other MCHs, on average, have 2-3 gastroenterologists. There are only very few cardiologists and gastroenterologists at Khulna MCH.

### 2) Average age and age range

In Dhaka MCH, average age of cardiologists and gastroenterologists are commonly in the forties, and age range from the youngest to the oldest is from thirties to fifties. It is likely that there is a similar situation at other MCHs to the one of Dhaka.

### 3) Number of staff with personal training experience

At Dhaka MCHs, there is no cardiologist and radiologists with personal training experience about angiography. From the interview with active cardiologists and radiologists at Dhaka MCH, very few training/workshop/seminar on angiography has been organized. As for gastroenterologists, more than 90% of the staff have received some workshop/seminar with short-term.

## 4.5.2 Situation of In-Service Training (IST)

As a general challenge in IST and human resource related OP, there seems a limited collaboration and coordination between LD-IST and other Line Directors who have training

<sup>5</sup> At surveyed MCHs, most of the radiologists neither medical technologists do not know how to use MRI-angiography and CT- angiography.

sub-projects under their OPs.

In addition, in many cases, the expenditure of each activity in OP is not necessarily same as the planned budget because the planned budget from the GOB is not always fully provided. In fact, the survey result from IMCH<sup>6</sup> under IST OP, for example, reveals that there is some gap between estimate/planned budget and actual expenditure. Furthermore, decreasing the number of planned batches and cancellation of some training courses are not so rare. Therefore, it can be considered that training items such as cost, and number of target people and batches in IST OP often change according to the financial situation of GOB.

#### 4.5.3 Nursing Colleges (BSc)

As shown in Table 3-6 in Chapter 3, lack of nurses is a big challenge for improvement of human resource for health in Bangladesh. MOHFW has been responding to this situation, for instance, by upgrading of the existing nursing colleges of diploma to bachelor's course and increasing the number of seats. However, the capacity of facilities gradually becomes insufficient for increase of students. In order to consider collaboration with future technical cooperation on nursing education by JICA, the Survey Team visited the BSc nursing colleges. This section describes the current situation related to human resources.

##### (1) Overview

There are seven Public Colleges of Nursing offering four year BSc course under MOHFW. These seven colleges are attached to the following MCHs; Chittagong, Dhaka, Mymensingh, Rajshahi, Rangpur, MAG Osmani in Sylhet and Sher-e-Bangla. These seven nursing colleges were upgraded from Nursing Institutes into BSc nursing colleges with increased number of places from 50 to 100 in 2007. Although the sector programs have been working for accommodating this upgrading by construction of buildings and installation of equipment, the space and equipment in the nursing colleges are still not sufficient.

The Faculty of Nursing of BSMMU offers BSc and MSc courses (still under preparation by MOHFW) and it is supported by the Government of South Korea financially and technically.

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<sup>6</sup> The GOB came out with a human resource strategy in 1992 for the contribution to the improvement of maternal and child health and nutrition, started construction in 1994, and inaugurated in 1999. IMCH is one of the largest agencies in terms of facility and staff sufficiency among training implementing agencies under IST OP. ICMH provides training to the health care service providers in the field of maternal and child health, reproductive health and communicable disease control.

## (2) Result

### 1) Availability of hostels

The users of hostels in the nursing colleges are the students of BSc nursing course (100 places per grade) and midwifery diploma course (25 places per grade) and interns of BSc nursing. The numbers of students and capacity of hostels in each nursing college are shown in the table below. All hostels were overloaded with students especially female.

Table 4-18: Number of Students and Capacity of Hostels by Nursing Colleges

Nursing College	No. of students in BSc course and Midwifery		No. of students in hostel		Capacity of hostel		Occupancy (%)		Remarks
	M	F	M	F	M	F	M	F	
Barisal	30	333	30	333	20	80	150	416	
Chittagong	461		-		108		-		
Dhaka	32	535	31	457	24	392	129	117	
Mymensingh	30	498	N/A	134	N/A	25	N/A	536	No hostel for male.
Rajshahi	49	442	N/A	63	N/A	-	N/A	-	No hostel for male.
Rangpur	27	395	21	351	20	188	105	187	
Sylhet	341		341		300		114		

### 2) Teachers in nursing colleges

There is only one Assistant Professor at Dhaka Nursing College among seven nursing colleges. Additionally, some professors and doctors from MCHs or Institutes teach the students as guest lecturers. A total of 400 students are taking the BSc course at each college, and approximately one full-time teacher looks after 18 to 33 students. The numbers of teachers in each college are shown in the table below. In this situation, the numbers of teachers are not insufficient to provide nursing education in theoretical lectures.

Table 4-19: Number of Teachers Allocated to the Nursing Colleges

Nursing College	Principal	Ass. Professor	Nursing Instructor
Barisal	1	0	14
Chittagong	1	0	12
Dhaka	1	1	22
Mymensingh	1	0	15
Rangpur	1	0	15
Rajshahi	1	0	12
Sylhet	1	0	12

#### 4.6 Hospital Management

This section describes actual situation related to hospital management in tertiary hospitals visited.

##### 4.6.1 Waste Management

Medical waste management is one of the critical issues among the matters targeted by MOHFW. HSM OP is introducing medical waste management in public and private health facilities. In Bangladesh, a medical waste management program is now implemented in primary, secondary & tertiary level hospitals. In the inter-ministerial meeting it was decided that, for final treatment and disposal of medical waste management the government will choose "centralized treatment facilities", so that all public and private health care facilities will use the same waste collection system. Under this discussion the "total medical waste management" will be done in two ways that is (i) In-house waste management and (ii) Out-house management.

The in-house management is the responsibility of each health care facility under MOHFW and the out-house management (collection, transportation, final treatment and disposal) is the responsibility of City Corporation under the Ministry of Local Government, Rural Development and Co-operatives.

In-house management has been introduced in MCHs in accordance with the waste management guideline issued by DGHS. Some hospitals use different color waste bins to separate the wastes by category; the general waste bin is black, toxic waste bin is yellow, sharp waste bin is red and recycle waste bin is green. However, it was observed during the visits there were cases of mixing of waste of any categories, no use of the proper waste bins and disposals of the waste outside unsafely. There were some cases of mixing of waste of any categories, no use of the proper waste bins and exposure of the waste outside unsafely.

Regarding the out-house management, the medical waste in the MCHs is collected by each City Cooperation at waste disposal sites in hospitals. Only Rajshahi MCH has an old incinerator, however it is too small to burn all the waste. According to the interview with HSM OP, there is no plan to install new incinerators at hospitals because the out-house management is centralized to City Corporation.



Figure 4-27: Waste Management

#### 4.6.2 Blood Transfusion

All surveyed MCHs have blood transfusion departments. They equip some refrigerators at their blood bank with generators and they monitor the temperature properly. In the laboratories, laboratory technologists check the blood for grouping, cross matching, and detecting antigen/antibody using screening kits, such as Syphilis, HBV, HCV, HIV1/2 and malaria which are transmitted by blood transfusion. Component preparation such as red cell concentrate, plasma and platelet by separator is also available at all MCHs. However, the infection prevention for technologists by themselves-is insufficient, for example, it was seen that some technologists did not use gloves and contaminated instruments or materials were mixed in general wastes, in all MCHs.





Figure 4-28: Blood Transfusion

#### 4.6.3 Clinical Laboratory

All MCHs have pathological and biochemical laboratories. However, the level of examinations and the laboratory conditions differ according to MCHs. The tests available in each MCH are shown in the table below.

Table 4-20: Tests Available at Clinical Laboratory in MCHs

Test	Barisal	Chittagong	Dhaka*	Khulna	Rajshahi	Rangpur	Sylhet*	BSMMU
Hematology	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Urine/stool test	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Biochemistry	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Serology	Yes	Yes	Yes	Yes	-	Yes		Yes
Immunology	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Semen analysis	-	-		Yes	-	-		Yes
Microbiology	-	Yes		-	-	-		Yes
PCR	-	-		-	-	-		Yes
Virology	-	-		-	-	-		Yes
Histopathology	-	-		-	-	-		Yes

Source: Interview with laboratory technologists at each MCH

\* For Dhaka and Sylhet MCHs, the survey was not completed.

At BSMMU, various advanced tests are available with the well-equipped laboratory. On the other hand, some laboratories in other MCHs have insufficient equipment or the installed equipment is old. They have to do a complete blood count manually using a microscope because they do not even have an automatic hematology analyzer.

#### 4.6.4 Human Resource Management

In each hospital level, the absence of nurses is obvious; for example, 2 ward-nurses are in charge of 50 beds /room with 100 patients in Dhaka MCH. Capability of medical staff regarding medical technology and knowledge are often not modernized, especially among nurses. Since there is a technical gap among medical staff, it is difficult to see the clinical outcomes through a comprehensive medical team approach.

#### 4.6.5 Medical Service Management

About medical service management, inappropriate safety control of medical care can be seen in radiation diagnosis in some hospitals, such as in the lack of use of radiation protective apron or exposing other patients to radiation emission through opened doors to the waiting area. However, the operation technique of X-ray apparatus by radiology technologists and the diagnosis procedure by radiologist are implemented appropriately at most of the MCHs.

Safety systems of pharmaceutical products are difficult to judge at a glance, and even the government has vowed to continue fighting the growing industry of illicit, substandard, counterfeit and life-endangering medicines. According to market research firm Business Monitor International, sales of pharmaceuticals in Bangladesh in 2013 are expected to reach \$1.8 billion. In 2010 the company estimated that due in part to the country's unlicensed pharmacies, about 9 percent of sales at the time were linked to "counterfeit drugs". In the hospital, drugs for inpatients and for the emergency room are supplied in quite limited quantity, and most patients need to buy the prescribed drug by themselves at extramural pharmacies. This makes it quite difficult for hospital service management that controls those counterfeit drugs and leads to correct clinical treatment.

In terms of safety management system of medical equipment, middle level medical equipment, such as ECG, chemical analyzers in laboratories and patient monitors, can be purchased and replaced by hospital and MOHFW, and therefore there is not much risk from aging degradation. Many of the MCHs are suffering to renew more sophisticated and expensive equipment, such as X-ray apparatus, CT and mammography, because of the difficulties in budgeting and installation. Thus, old methods and physically degraded equipment are not able to perform the best results in their images, and it is hard to diagnose with them appropriately. As a result, hospitals use

limited equipment which is not failed barely, and those equipment can examine a certain number of patients. It causes the indirect problem that many out-patients choose to run the imaging test at private diagnostic centers or hospitals paying higher fee than at public hospitals.

Overloaded patient visit particularly in MCHs, is able to induce medical errors based on human error such as registration mistake, patient data mix-up and passing the wrong medicine, etc. Moreover, it cannot deny the potential of illegal fees between patients and medical staffs to keep medical staff's attention to receive a good care. Overloaded patient visit makes difficult to write patient records for all patients. Due to the lack of patient record in general makes the situation more difficult to feedback and to supervise the medical procedure objectively.

#### 4.6.6 Facility Management

Tertiary hospitals like MCHs are the only opened facilities which accept public emergency patients 24 hours a day functionally. The overloaded hospitals are not able to manage beds well nor do they have a good nursing system to care for in-patients. Also, overcrowding of hospitals occurs not only because of patients but also because of families who take care of patient's nursing and food preparation. Many patients who come from different areas and life-styles do not understand infection and sanitary control and waste management, so that limited hospital cleaning staff cannot maintain proper tidiness and cleanliness all day long even with their efforts and with a hospital segregation rule of medical wastes. The fact that over-admitted patients and their families temporary lie on the floors and corridors in the hospital presents a large risk in the case of disasters/ hazards in the facility. Besides, hospitals keep attention to the area which needs severe hygienic control, such as operation theatre, ICU and laboratory, and those sections are under controlled for cleanness and segregation of medical wastes.

#### 4.6.7 Patient Satisfaction

According to the interviews with patients who choose tertiary hospitals, patients point out that:

- DHs do not have modern equipment for diagnoses.
- DHs do not have enough specialists.
- Tertiary hospitals have emergency entrance open 24 hours a day with specialists.
- When medical fees are the same, they prefer to be able to consult various specialists in tertiary hospitals.

Those answers from patients imply that citizens have confidence in the treatment at the tertiary hospitals more than the secondary hospitals. To let citizens to change their behaviors to choose the secondary hospitals, strengthening of secondary hospitals is necessary with the perspectives of adequate allocation of medical staffs, updating of medical equipment with sufficient training,

and granting of some autonomy for management by the hospital itself to respond to patient's needs and to ensure efficiency.

#### 4.6.8 Overcrowding

Table 4-1 shows the bed occupancy rates in all MCHs are very high (range: 98% to 238%). Besides, the diagnostic departments such as radiology and imaging are extremely crowded and the numbers of investigation are over the capacity of operation due to lacking and aged equipment in all MCHs. Patients and their families are also affected by this congestion and have to make a very long line to wait for the investigations. Sometimes they have to come back again to MCHs the next day since the service hours end at 14:00. The Gastroenterology Department in MCHs also faces the overload of investigations, therefore, approximately 53-70% of patients who are advised to take examinations have to find other ways such as going to other private hospitals. The detailed number of patients did not get gastroenterology examination required is available in Table 7-27 in 7.3.2 in Chapter 7.

#### 4.6.9 Patient Information Management

Patient information management varies by tertiary hospital. At the reception, the receptionists record patient's name in registers and give a ticket with tentative number for consultation. Some MCHs use clinical records using their original forms for patients admitted. Therefore, it is difficult to track the patient using the record. Registers for recording examined patients are used at radiology departments and clinical laboratories. Some MCHs use computers for recording examined patient information by equipment. However, it was not seen that computerized system of patient information management is established in radiology departments.

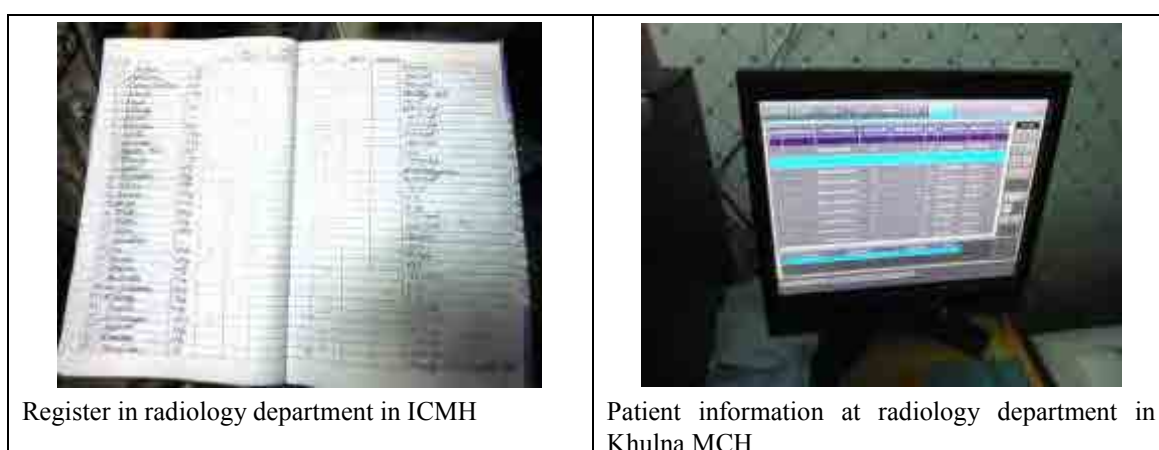


Figure 4-29: Method of Recording of Examined Patient Information

**CHAPTER 5:**  
**Japan's Support to Health Sector**  
**in Bangladesh**



## CHAPTER 5: Japan's Support to Health Sector in Bangladesh

### 5.1 Current Supports for Health by the Japanese Government

#### 5.1.1 Progress of the Implementation of the Current Technical Cooperation and Challenges

JICA has been supporting the effort of GOB especially in the areas of maternal, neonatal and child health and health system strengthening through technical cooperation, known as Safe Motherhood Promotion Project (SMPP) Phase 1 and 2. SMPP phase 1 has been implemented from July 2006 to June 2011 for 5 years. Currently, SMPP Phase 2 is ongoing and the summary of the project is shown in the tables below.

Table 5-1: Outline of the Project

Title	Safe Motherhood Promotion Project (SMPP) Phase 2
Period	July 2011 – June 2016 (5 years)
Target area	Whole country
Project site	Dhaka city, Narsingdi, Jessore, Satkhira Districts
Target group	1. Community people, particularly pregnant and post-partum women and neonates 2. All level relevant staff under department of health and family planning at central, district and Upazilla
Project purpose	The approaches to improve MNH service quality and utilization in line with HPNSDP are expanded in Bangladesh.

Table 5-2: Progress of Implementation of Training by RCHCIB Supported by SMPP2 as of June 2013

Type	Training completed (No. of participants)	Training to be conducted (No. of participants)
CG/ CSG Training (Master Trainers)	59	-
Local Government (Union Parishad)	-	58,500
Community Group (CG)	(All 12,248 CGs)	(Completed)
Community Support Group (CSG)	319,014* (For 19,488 CSGs)	357,204 (For 21,012)
Community Health Care Provider (CHCP)	13,225	275**

Note\*: Under the GAVI supported areas (2,047CCs), participants of training were 15 persons per CSG.

Note\*\*: Total number to be trained is more than 13,500, as RCHCIB needs to compensate for the 15 CHCPs who have left the position.

Source: Joint mid-term review report on Japanese Technical Cooperation Project for SMPP2, 2013

The planned equipment for hospitals to provide EmOC services and a total of thirteen motorbikes for SMPP2 staff members to travel to the sites were purchased. The list of equipment is available in Annex 10<sup>1</sup>.

The challenges identified in the mid-term review are as follows.

<sup>1</sup> Joint mid-term review report on Japanese Technical Cooperation Project for SMPP2, 2013

- Transfer of the officers in leadership roles caused delays in the implementation of the project activities.
- Most hospitals are overloaded, therefore it is difficult for hospital staff to maintain their motivation to improve the hospital service quality.
- Lack of manpower at health facilities could hamper the provision of quality EmOC services.

#### 5.1.2 Progress of the Planning of Future Technical Cooperation Projects and Challenges

A Data Collection Survey on Nursing Education for Improvement of the Quality of Nursing Services in Bangladesh has been conducted by JICA to draft a plan for technical cooperation on nursing education.

#### 5.1.3 Progress of Implementation of the Yen Loan Project (The Maternal, Neonatal and Child Health Improvement Project) Phase 1

The Yen Loan Project Phase 1 is provided to meet the financial demand of the first three years of HPNSDP 2011 - 2016. The Phase 1 has been progressing almost as planned. The activities for 4 OPs supported by the Phase 1 are listed in Table 5-4.

Table 5-4: The Activities and Progress Supported by the Yen Loan Project Phase 1

No.	Name of OP	Activities	Budget (Lakh in Taka)	Progress
1	MNCAH	Providing CEmOC equipment	730.65 (FY2012-2014)	The listed equipment on OP1 would be procured and distributed by GOB according to the Annual Procurement Plan in FY2012-2013 and FY2013-2014.
3	CBHC	Training for CHCP, CG and CSG	12,747.00 (FY2011-2016)	12,063 CGs, 13,225 CHCPs and 309,150 persons of CSG were trained as of June 2013.
9	HSM	Equipment (Dhaka Shishu Hospital)	800.79	The procurement of listed equipment is in process of tendering by GOB.
		Support for TQM	200 (FY2014-2016)	TQM training is ongoing.
18	MCRAH	Training for FWVs on EmOC and midwifery	1,101.60 (FY 2011-2016)	2 courses of training are ongoing.
28	PFD	Renovation/ Expansion (6 UHCs and 5 DHs) Expansion of only OT (1 DH)	15,709.77 (FY2011-2016)	Expansion of 6 UHCs with 31 beds to 50 bed hospitals is mostly completed. Upgrading of 5 DHs is ongoing and 50% of construction has been accomplished.

Source: Interview record with JICA local staff, APIR 2013, OP documents

#### (1) Training supported by the Yen Loan Project Phase 1

The Yen Loan Project Phase 1 has been supporting the training provided by CBHC OP, HSM OP and MCRAH OP since 2011 for coordinating with the technical cooperation project, “Safe



Motherhood Promotion Project Phase 2” by JICA. The summary of the training is shown in the table below.

Table 5-5: Summary of Training Courses Supported by the Yen Loan Project Phase 1

OP	Training	Financial Year	No. of participants
CBHC	CHCP training	2011-2012	4,807
	CHCP training	2012-2013	4,242
	CG training		156,298
	CSG training		226,899
	CHCP training	2013-2014	698
	CG training (Drop out)		14,501
	CHCP refresher’s training related to Training of Trainers (TOT)		N/A
	CHCP refresher’s training		13,114
	CSG training		333,489
	Local Government Representatives (LGR) Training	-2016	66,000
HSM	Training on Total Quality Management (TQM)	2014-2016	9 MCHs, 20 DHs and 20 UHCs, 2 batches overseas
MCRAH	Training for FWV on Midwifery	2012-2015	141
	Training for FWV on EmOC		N/A

Source: CBHC OP: Interview with LD of CBHC, HSM OP: Revised OP document in 2014, MCRAH OP: Revised OP document in 2014

The contents of training courses are described with explanation of OPs related to these training in 3.6.5 in Chapter 3.

## (2) Medical equipment

The Yen Loan Project Phase 1 has been supporting HSM OP for procurement of medical equipment for Dhaka Shishu Hospital and MNCAH OP for CEmOC equipment. The list of equipment is available in Annex 11.

## (3) Renovation/ expansion of DHs and UHCs

The Yen Loan Project Phase 1 has been supporting PFD OP for construction of renovation and/or expansion of 6 UHCs and 6 DHs. The construction is summarized in the tables below.

Table 5-6: List of UHCs Supported for Expansion from 31-Beds to 50 Beds

No	UHC	District	Division
1	Delduar	Tangail	Dhaka
2	Kathalia	Jhalakathi	Barisal
3	Amtali	Barguna	Barisal
4	Dherai	Sunamganj	Sylhet

5	Dharmapasha	Sunamganj	Sylhet
6	Akhaura	Brahmanbaria	Chittagong

Source: Progress report by HED in June 2014

Table 5-7: List of DHs to be Renovated/Expanded

No	DH	Division	Up-gradation	Progress as of April 2014
1	Manikganj	Dhaka	100>500 beds	Hospital building 27% done. 1 <sup>st</sup> floor roof casting completed.
2	Munshiganj	Dhaka	50>250 beds	5 <sup>th</sup> floor roof casting completed. Brick work & finishing work is going on in other floor.
3	Barguna	Barisal	50>250 beds	Hospital building 23% done. Service pile driving & Soil excavation for foundation base work is going on.
4	Bargerhat	Khulna	100>500 beds	2 <sup>nd</sup> floor roof casting preparation is going on.
5	Gazipur	Dhaka	100>500 beds and Trauma Centre	NOA given on 12-3-2014. Contract sign on 07-04-2014. Soil excavation work started.
6	Satkhira	Khulna	OT room only	

Source: Progress report for April 2014 ongoing ADP Project under HPNSDP by PWD. \*: Source is the material for the Meeting between MOHFW and JICA on the Yen Loan Project Phase 2 on 17 June 2014 prepared by JICA Bangladesh Office.

## 5.2 Possibility of Collaboration with the Current Technical Cooperation

The need for collaboration with the SMPP2 and the Yen Loan Project Phase 1 remains as follows.

### 5.2.1 Training for CSG (CBHC OP)

In the catchment area of each CC there are three Community Support Group (CSG) comprising of 13-17 members. The capacity building of the CG/CSG are already being disseminated nationwide through RCHCIB as well as resources from JICA and SMPP2. To replace resigned CSG members, continuous training for new members is required.

### 5.2.2 Training for FWVs on EmOC and Midwifery (MCRAH OP)

Training for FWVs on EmOC and midwifery has been supported by the Yen Loan Project Phase 1. The training will continue throughout the planned period of MCRAH OP 2011-2016, however, the allocated fund for MCRAH by the Yen Loan Project Phase 1 was all disbursed. The continuous support by the Yen Loan Project Phase 2 is required to continue and complete the training as planned.

### 5.2.3 Up-gradation of Nursing Colleges Attached to 7 old Medical Colleges (PFD OP)

JICA is newly planning to support for nursing education services by a technical cooperation focusing on the BSc course in near future. Currently, there is a shortage of the space of academic buildings and student hostels caused by increased number of sheets from 50 to 100 in those nursing colleges. In order to implement the technical assistance smoothly, up-gradation of academic buildings and student hostels of those nursing colleges under PFD OP should be accelerated. To improve the practical training, a set of well-equipped skill laboratory is needed as well.

### 5.2.4 Installation of Medical Equipment for the Upgraded DHs and UHCs Supported by the Yen Loan Project Phase 1 (For DHs: HSM OP, For UHCs: ESD OP)

According to the current situation of renovation/expansion of 6 DHs supported by the Yen Loan Project Phase 1, the buildings will be upgraded without necessary medical equipment. Because the installation of the medical equipment for those DHs are not clearly planned in HSM OP. To maximize the effect of their renovation/expansion, the installation of equipment is required in a timely manner.

As a lesson learnt from implementation of the Yen Loan Project Phase 1, the components such as construction, installation of medical equipment and training for health staff should be packaged into a plan. Since the responsibilities of each component are owned by different OPs, a coordination across the OPs is a challenge as been experienced by HPNSDP. Although the coordination of the Yen Loan Project Phase 2 will depend on the current system of HPNSDP until it ends in 2016, it may require an alternative plan to improve such coordination if the Yen Loan Project Phase 2 supports to build any health facilities after HPNSDP. One option will be to establish a body to oversee the implementation of the Yen Loan Project Phase 2.



## **CHAPTER 6:**

### **Analysis of the Survey Results**



## CHAPTER 6: Analysis of the Survey Results

### 6.1 Analysis by Survey Item

In order to propose the contents of the sub-projects, the Survey Team first selected challenges and needs from the survey results. The priority and feasibility of the activities to be proposed were then analysed according to survey items in accordance with the current situation and pre-determined criteria set in Chapter 1: its assistance to MNCH, coordination with HPNSDP 2011–2016, collaboration with JICA's support, contribution to UHC and gender mainstreaming, and utilization of Japanese technology. The activities are divided into three elements: health facility, medical equipment, and training.

#### 6.1.1 Health Situation

##### (1) Challenges (Findings)

- Bangladesh has been making good progress in almost all of the health-related MDGs, especially the child mortality rates, indicators of communicable diseases, and maternal mortality ratio. However, maternal health services coverage is still lower than in neighbouring countries.
- Conversely, NCD-related mortality rate in Bangladesh has been rapidly increasing since the early 1990s because of its epidemiological and demographical transitions.

##### (2) Needs

- The number of well-trained maternal health service providers is not sufficient for the demand.
- It is necessary to detect NCDs (including injuries) in their early stages and give appropriate clinical treatment. Advanced medical services, especially imaging diagnostic services, have to be strengthened in each division for early detection and correct treatment.

##### (3) Analysis

- The number of well-trained maternal health service providers is not sufficient for the demand.

It will be discussed in the next section (about the MNCH).

- Advanced medical services, especially imaging diagnostic services, must be established in each division for early detection and correct treatment.

One response to the increase of NCD-related mortality is the urgent need to improve the health situation in Bangladesh. Generally, imaging diagnosis is very useful to the early detection and correct treatment of NCDs, including injuries.

However, imaging diagnosis is not accessible to everyone, especially impoverished people or those living in rural areas. The reasons are as follows. First, there are few hospitals with advanced imaging diagnostic equipment. Second, the examination fee for imaging diagnosis is expensive; poor people cannot afford to undergo examinations in private hospitals because they cost two to three times more than public hospitals. Finally, people who live in areas where there is no hospital with necessary diagnostic equipment must come to Dhaka, which accrues added costs for traveling.

If MCHs in each division at least provided imaging diagnostic services, NCDs will be better detected at the early stages and people will be able to obtain appropriate treatment.

### 6.1.2 MNCH

#### (1) Challenges

- MNCH service coverage, such as delivery attended by skilled birth assistants (SBAs), remains low.
- Comprehensive emergency obstetric care (CEmOC) services are not sufficiently provided at secondary hospitals due to lack of anaesthetists and gynaecologists.
- The condition of some facilities, such as the buildings, power supply, and cleanliness, is not suitable to provide CEmOC at some secondary hospitals.
- Maternal mortality and child mortality are much improved, however, neonatal deaths still account for 60 % of all under-five deaths.
- Advanced newborn care facilities such as NICUs and SCANUs are limited.
- Screening of female-specific cancers are promoted by DGFP, but few hospitals can provide further investigation for positive cases of breast cancer.

#### (2) Needs

- Strengthening of MNCH service providers in communities to promote MNCH service coverage nationwide
- Improvement of CEmOC services in secondary hospitals
- Upgrading the newborn care facilities such as NICUs and SCANUs
- Improvement of definitive diagnosis capacity for female-specific cancers

#### (3) Analysis

MNCAH OP, CBHC OP, and MCRAH OP are working on promoting MNCH service coverage.

- Strengthening MNCH service providers in communities to promote MNCH service coverage nationwide

CCs are frontline health facilities for primary health services including MNCH in communities. The MOHFW has a target of establishing 547 CCs by the end of the HPNSDP 2016; however,



544 out of these 547 CCs do not yet have agreed-upon locations or the locations have not been donated by the landholders. The JICA's continuous support of CCs via the Yen Loan Project Phase 2 would synergize with the support provided by SMPP1, SMPP2, and the Yen Loan Project Phase 1, which would thereby reaffirm the JICA's commitment to improving the health system at the community level.

The Yen Loan Project Phase 1 financed the training of family welfare visitors (FWVs) to increase the number of deliveries attended by SBAs. Providing additional financing for FWVs who are posted at the union level to receive training in midwifery and EmOC matches the JICA's priority regarding reported shortages of obstetricians/gynaecologists at DHs. The provision of training for community support groups (CSGs) is also suggested for the Yen Loan Project Phase 2. Effective CSGs are the backbone of functioning CCs, as CSGs interface with the people in the communities and create demand for health services at CCs. The capacity development of the CSGs is one of the main components of SMPP.

When female health status improves, women can participate in socioeconomic activities and earn their own livelihoods. Reducing the health risks for women is an essential contribution to reducing the gender gap. The Project shall provide some assistance in the training activities required for the implementation of a technical cooperation project of the JICA, called SMPP2, in order to improve MNCH. Thus, continuous support for CBHC OP and MCRAH OP will aid in improving MNCH, HPNSDP coordination, JICA support, UHC, and gender mainstreaming.

- Improving CEmOC services in secondary hospitals

To coordinate with MNCAH OP, MNCH in Bangladesh requires (1) increasing the ratio of deliveries attended by SBAs to supplement the low ratio of delivery in health facilities and (2) strengthening the services provided during the perinatal period. What must be done at health facilities is (1) prioritizing provision of the basic emergency obstetric care (BEmOC) in primary health facilities and (2) extending the provision of CEmOC in secondary health facilities. The services included in CEmOC are caesarean section and blood transfusion in addition to the services included in BEmOC. Air cleanliness is required as an environmental condition in operating theatres for caesarean section. Additionally, various types of risk management for operation and knowledge and experience for health workers are necessary, such as measures against communicable diseases during and after operation, blood transfusion measures against haemorrhage and anaesthetic management to monitor and control patients' vital life functions. The inspection by the Survey Team revealed the following problems in district and general hospitals: (1) the environment in the operating theatres was not appropriate for caesarean section because the power supply is not stable and the space is insufficient; and (2) there were

insufficient numbers of health workers, especially anaesthetists and gynaecologists. In other words, an environment appropriate for the provision of CEmOC cannot be established merely with renovation of operating theatres and procurement of medical equipment. Therefore, it is recommended that hospitals take measures to ensure human resource development and improve hospital management before upgrading their facilities and equipment.

The mid-term review of SMPP2, the JICA technical cooperation, has identified that the shortage of human resources and low motivation of workers were problems faced in the project. The review stated clearly that CEmOC cannot be improved with only the provision of hardware; these problems must be solved first. Despite the high demand for CEmOC, it seems that the timing of equipment procurement for CEmOC in secondary health facilities does not fit with this project, on the basis of the lessons learned mentioned above. Equipment procurement will be suitable only after necessary human resources are allocated.

- Upgrading the newborn care facilities such as NICUs and SCANUs

Meanwhile, measures to care for underweight and jaundiced infants are urgently required, even if they were born naturally. Supporting such infants requires the renovation of health facilities to establish a SCANU equipped with infant warmers and phototherapy systems. SCANU equipment does not need highly qualified health workers to operate; however, SCANU systems separate babies from mothers. Namely, the system requires nurses to take care of babies, and this human resources issue delays the implementation of SCANUs.

- Improvement of definitive diagnosis capacity for female-specific cancers

Among the female cancer patients in the National Institute of Cancer Research and Hospital, breast cancer was the leading type (25.8 %), followed by cervical cancer (20.5%)<sup>1</sup> (see Table 6-1).

Table 6-1: Distribution of Cancer Patients by Top Five Cancer Types

Male			Female		
Type of cancer	No.	%	Type of cancer	No.	%
Lung	1,843	27.0	Breast	1,389	25.8
Lymphoma	619	9.1	Cervix	1,102	20.5
Esophagus	418	6.1	Lymphoma	305	5.7
Stomach	347	5.1	Ovary	287	5.3
Connective tissue	309	4.5	Gall bladder	253	4.7

Source: Health Bulletin 2013

<sup>1</sup> Health Bulletin 2013

A WHO report indicated that, in recent years, the incident rate of breast cancer in Bangladesh among women of all ages is 22.5 per 100,000 women, while that for women aged 15–44 years is 19.3 per 100,000<sup>2</sup>.

MCRAH OP promotes screening for cervical and breast cancer by VIA and CBE in communities. However, detected positive cases cannot have definitive diagnoses because few public health facilities in Bangladesh have the necessary equipment, such as mammography, or female radiographers. Under such circumstances, the provision of mammography machines to MCHs—which are medical facilities that are technically and administratively capable of operating the equipment—in each division is the first step to extending screening countrywide, is consistent with the “gender-mainstreaming” policy of Japan, and meets the needs of Bangladesh.

### 6.1.3 Medical Equipment

#### (1) Challenges

- Imaging diagnostic equipment in MCHs is constantly aging, and much of it will expire soon.
- Some of the equipment in MCHs is broken and takes time to repair.
- Much of the imaging diagnostic equipment is overused because the amount of equipment is insufficient for the large number of patients.
- Some digitalized imaging diagnostic equipment has already been installed in MCHs; however, the digital data archiving system has not been introduced and data collection and archiving are not performed efficiently.
- The Yen Loan Project Phase 1 supports the renovation and extension of the buildings of six DHs; however, installation of necessary medical equipment for upgrade has not been planned.
- MCH kits and FWC kits are not sufficient for trained FWVs

#### (2) Needs

- Introduction of advanced imaging diagnostic equipment to respond to the increase in NCD-related deaths, including injuries
- Replacement and/or installation of medical equipment, especially imaging diagnostic equipment, in MCHs
- Introduction of management system of digital imaging and patient information such as a picture archiving and communication system (PACS) or a radiology information system

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<sup>2</sup> [wordpress.com/2013/01/20/breast-cancer-in-bangladesh/](http://wordpress.com/2013/01/20/breast-cancer-in-bangladesh/), 2013

(RIS)

- Supplementary installation of advanced laboratory equipment to fill in the gap between the amount of equipment and the increase in students in BSc nursing colleges
- Installation of necessary medical equipment at DHs supported by the JICA for renovation and extension of their buildings.

### (3) Analysis

- Introduction of advanced imaging diagnostic equipment to respond to the increase in NCD-related deaths, including injuries

To reduce NCD-related deaths, early and appropriate diagnosis is necessary, as this allows for patients to be relayed for appropriate treatment. The following medical devices are effective in detecting NCDs

- MRI and angiography: neurological and cardiovascular diseases
- CT: fractures, bodily trauma, and cerebral infarction
- Various X-ray apparatuses: lung disease, fractures, and digestive system diseases
- Ultrasound apparatus: diseases in internal medicine, cardiology, OB/GYN, endocrinology, and urology
- Mammography: breast cancer
- Endoscopy: digestive system diseases

The main advantages of these pieces of equipment are as follows: (1) they are non-invasive, which will reduce the burden on patient's health; (2) they have a shorter operation time, which will reduce the waiting time and increase the processing capacity during day duty; and (3) they allow for a combination of diagnoses, which will be effective for an integrated determination of diseases.

The Japanese medical equipment used globally is recognized by its “non-invasive/minimally invasive” diagnostic ability and its use in treatment to reduce the suffering of patients and improve their quality of life (QOL). Endoscopic diagnosis and treatment, radiological diagnosis and treatment, and imaging diagnosis are examples of such technologies.

- Replacement and/or installation of medical equipment, especially imaging diagnostic equipment, in MCHs

MCHs have a limited amount of medical equipment, and this equipment is generally rather old. Survey results show that existing equipment is limited at present because of its degradation and/or penchant for malfunctioning, and it is not sufficient for handling the quantity of patients. Furthermore, the overload of patients accelerates the degradation of this equipment by overuse.

The imaging diagnostic equipment in MCHs has been used for nearly ten years and its period of use is about to expire. Thus, strengthening diagnostic function in MCHs is an urgent need.

- Introduction of a management system for digital images and patient information such as a picture archiving and communication system (PACS) or a radiology information system (RIS)

Introduction of a PACS/RIS would innovate information management systems in MCHs. PACS and RIS are advanced management systems for archiving digital images and patient information efficiently. The information is very useful for referral, clinical review, distance e-health, statistics, and medical education because the system can accumulate data in servers, which can be connected to other hospitals in the future. Japanese technology would be applicable for the installation of PACS/RIS because such systems are already familiar in hospitals in Japan.

- Supplementary installation of skills laboratory equipment to fill the gap between the amount of equipment and the increase in students in BSc nursing colleges

In order to improve the quality of practice in higher nursing education, new equipment for skills laboratories should be procured and installed at BSc nursing colleges. This will help to implement the JICA's future technical cooperation endeavour in BSc nursing education.

- Installation of necessary medical equipment at DHs supported by the JICA for renovation and extension of their buildings.

This corresponds to JICA's support. Although the construction will be completed soon, there is no plan to install necessary medical equipment. Since the HSM OP is responsible for the installation of medical equipment in secondary hospitals, the project can support the provision of this equipment by coordinating with the HSM OP. Therefore, this activity can be one of sub-projects within HPNSDP 2011–2016.

#### 6.1.4 Health Facility

##### (1) Challenges

- The buildings and facilities of MCHs are aging and space is insufficient for large numbers of patients.
- Protection against radiation exposure from radiology imaging diagnostic equipment is not appropriate because most of the facilities in the radiology department in MCHs are aging and do not have suitable radiation shields.
- Facility improvement of BSc nursing colleges has been implemented according to PFD OP and NES OP; however, the capacity of academic buildings and hostels is still insufficient.

## (2) Needs

- Facility improvement in public health facilities, especially MCHs
- Facility improvement in radiology departments to protect against radiation exposure
- Facility improvement and extension of academic buildings and hostels in BSc nursing colleges

## (3) Analysis

- Facility improvement in public health facilities, especially MCHs

Facility improvement in MCHs is necessary to secure quality medical services for patients.

Equipment is currently mainly installed in the main building. However, radiation shields and waiting rooms are not in good condition. Additionally, renovation of the main building risks damaging the structure of the old building. Establishing new imaging diagnostic facilities avoids this risk. In addition, introducing modern technology to ensure patient safety and providing high-level performance in an optimal environment can serve as a model for other hospitals. Independent diagnostic facilities can reduce the patient wondering in the hospital.

Thus, specific imaging diagnostic equipment will be installed in the building when needed. Furthermore, the facility is expected not only to provide advanced medical treatment but also to contribute to medical education by being a part of the MCH buildings.

- Facility improvement of radiology department to protect against radiation exposure
- Improvement of the health facility environment will make it possible to obtain better outcomes from health services, including improved safety for the operators of the equipment and patients. Japanese technology can be used to improve protection against radiation exposure through facility design and special materials for radiation shield.

Design policy for facility planning: Achieving User-Friendliness and Advanced Medical Services

- User-friendliness can be established by incorporating patients' and healthcare professionals' perspectives.
- Foreseeing the future needs of healthcare services in Bangladesh, the facility shall have highly advanced medical equipment that allows for high-quality medical care.

- Facility improvement and extension of academic buildings and hostels in BSc nursing colleges

In addition, future technical cooperation in the area of nursing education is being considered.

With regard to the nursing education project that will be designed, the nursing college, where the number of students enrolled per year has increased from 50 to 100 with the implementation of a plan to double the number of nurses with a bachelor's degree, does not have a sufficient number of hostel rooms for students. As the nursing college does not have a sufficient number of classrooms either, classes are held in shifts. The shortage of hostel rooms is a more serious problem, however, because students will have difficulty attending classes if they are not given rooms in the hostels. Therefore, construction of hostels has been planned as part of a program under HPNSDP 2011–2016 for urgent implementation.

The extension of the academic buildings of nursing colleges was mentioned in PFD OP, and the construction needs up-gradation. By including this extension plan in the Yen Loan Project Phase 2, it may accelerate the construction, which is line with the JICA's planned nursing project.

#### 6.1.5 Human Resources for Health

##### (1) Challenges

- Shortage of nurses is a critical health issue in Bangladesh.
- All MCHs face a shortage of female radiographers.
- Few cardiologists have sufficient experience and skills in angiography.
- Medical staff are not much aware of radiation safety.
- Few staff in radiology department have knowledge and skills of user maintenance.
- Management capacity for patient information such as clinical records, examination reports, and patient registers for examination is limited because health staff in MCHs are often too busy to individually tend to the huge numbers of patients. Additionally, the information management in most of health facilities is not efficient because of a paper-based archiving system.

##### (2) Needs

- Training in MNCH services at the community level (To respond to challenges on MNCH issues described in 6.1.2)
- Support for nursing education
- A greater number of skilled doctors and medical technologists, especially females
- Training in imaging diagnosis and operation of equipment for doctors and medical technologists
- Training in user maintenance of imaging diagnostic equipment for medical technologists
- Training in patient information management

### (3) Analysis

- Training in MNCH services at community level related to SMPP2

SMPP2, which supports training in MNCH, has been implemented and will end in 2016. As assistance to SMPP2, funds will be provided for a nationwide extension of the training until the completion of SMPP2. The provision of the funds should be planned as part of a program under HPNSDP 2011–2016.

- Support for nursing education

The JICA's technical cooperation for nursing education will be planned with a focus on BSc courses. If the Project supports hardware improvement in BSc nursing colleges, then synergy between software and hardware support is expected with the technical cooperation.

- Increase in skilled doctors and medical technologists

The GOB decides the quota for the health workforce in health facilities. Therefore, allocation of skilled doctors and medical technologists in MCHs should be considered by the GOB.

- Training in imaging diagnosis and operation of equipment for doctors and medical technologists in MCHs

Although non-invasive/minimally invasive technologies are beneficial to patients, doctors who intend to use them must be trained well on how to use them appropriately. Their examination technique is very important for ensuring that patients feel comfortable in the examination. Their capacity for reading diagnostic images is also essential for making correct diagnoses to relay patients to the correct treatment so that they might recover faster.

According to the survey results, medical staff are not much aware of radiation safety. Medical staff who work in radiology departments should have knowledge of radiation exposure and safety to protect themselves and patients.

MCHs are teaching hospitals where the medical staff of the next generation are trained. It is important for those trainees to learn how to use advanced equipment to make correct diagnoses and how to operate the most up-to-date equipment in the process of acquiring correct knowledge and technologies. This project will support the provision of UHC through its contribution to the training of health workers that will be assigned to health facilities throughout the country.

Thus, training on imaging diagnosis is necessary for radiologists and radiology technologists to improve and maintain the advanced services.

- Training in user maintenance of imaging diagnostic equipment for medical technologists



User maintenance of medical equipment is essential to properly maintain the operation of equipment. To keep equipment in good condition and ensure it has a long life, training in user maintenance is necessary for medical staff.

- Training in patient information management

If a PACS/RIS is introduced to MCHs, then training in the utilization of the PACS/RIS for radiologists, radiology technologists, and receptionists is necessary for smooth operation because this would be the first instance of such a system being installed in Bangladesh. It is recommendable that training course be organized in Japan for representatives of radiology departments to see the actual operation of the PACS/RIS and utilization of archived information.

#### 6.1.6 Hospital Management

##### (1) Challenges

- Bed occupancy rates in MCHs exceed 100% (100–238%).
- Huge number of patients and families visit MCHs, which results in overcrowding in wards, OPD, and diagnostic departments.
- A patient information management system has not been established in health facilities.

##### (2) Needs

- Improvement in medical service capacity of MCHs
- Improvement in patient information management in MCHs

##### (3) Analysis

- Improvement in medical service capacity of MCHs

Although secondary and tertiary hospitals provide 24-hour emergency services, MCHs can provide more advanced services than can DHs because MCHs have more functions for special care and more health staff. Patients prefer more specialized and better equipped hospitals if they are to pay the same fees at any hospital. This results in a negative cycle wherein the patients gather more at MCHs than at other hospitals.

Since too many people visit MCHs that have the emergency departments, the hospitals are not able to perform to meet the demand within regular working hours. Additionally, there are many outpatients who could not receive consultations even though they were waiting from the morning. Some patients go to private hospitals and pay more expensive diagnostic tests to reduce the time taken for diagnostics and have a smooth consultation; however, poor people cannot afford to do it.

Additionally, there is an increasing need for imaging diagnostic equipment to respond to the increase in NCDs. Upgrading the functioning of medical examinations in MCHs is considered to provide better health services and thereby move towards achieving UHC.

Strengthening secondary hospitals is a fundamental approach to health referral system reform, but the human resource development plan cannot immediately satisfy the required amount of medical staff to empower secondary hospitals. To solve the current situation of overloaded MCHs, strengthening MCHs must be prioritized until the secondary hospitals have been sufficiently upgraded.

- Improvement of patient information management in MCHs

The MCHs are teaching hospitals and have more medical staff than other hospitals, including interns and residents involved in clinical training. Because part of medical education is to ensure young trainees gain experience through numerous clinical consultations, MCHs should practice correct clinical procedures, medical ethics, bio-safety, patient-oriented medicine, and evidence-based medicine. It is recommended that MCHs improve the management of patient information such as PACS/RIS. Digitalized information is useful for preparing teaching materials and sharing information. PACS/RIS can contribute to the management of not only images and patient information but also usage of equipment.

## 6.2 Selection of Sub-projects

The sub-projects below were selected in accordance with the analysis considering feasibility and selection criteria. The activities related to the coordination of HPNSDP 2011–2016 and JICA's support are categorized as “the sub-project within HPNSDP 2011–2016.” The activities not directly related to HPNSDP 2011–2016 are categorized as “the sub-projects beyond HPNSDP 2011–2016.”

### 6.2.1 Sub-projects within HPNSDP 2011–2016

#### (1) Continuous support for MNCH services by the JICA

The JICA has supported MNCH services through SMPP2 and the Yen Loan Project Phase 1. But continuous support is necessary to complete the activity plans of HPNSDP 2011–2016. As one of the sub-projects within HPNSDP 2011–2016, the support for community-based MNCH services is proposed as follows.

- 1) Training of CSGs to strengthen the function of CCs (CBHC)
- 2) Construction of new CCs to expand the community-based health service area, thereby

increasing MNCH service coverage (CBHC and PFD)

- 3) Midwifery training for FWVs to increase the number of SBAs (MCRAH)
- 4) EmOC training for FWVs to increase the number of SBAs (MCRAH)
- 5) Distribution of MCH kits and FWC kits to Union Health Family Welfare Centers (UHFWCs) to provide delivery services (MCRAH)

(2) Provision of medical equipment at 6 renovated and/or expanded DHs supported by the JICA. The construction will be completed soon, and it is necessary to, at the very least, install the medical equipment in accordance with the standard. Since HSM OP is responsible for the installation of medical equipment for secondary hospitals, the project supports the provision of this equipment in conjunction with HSM OP. Therefore, this activity is one of the sub-projects within HPNSDP 2011–2016.

(3) Improvement of BSc nursing colleges

Support for the improvement of BSc nursing colleges to respond to the increase in the number of students and to improve the quality of their education are sub-projects within HPNSDP 2011–2016; they are outlined as follows.

- 1) New construction of students' hostel building (NES and PFD)
- 2) Extension of academic buildings (NES and PFD)
- 3) Provision of furniture for new students' hostels (NES and PFD)
- 4) Provision of equipment for skills laboratories (NES)

#### 6.2.2 Sub-projects beyond HPNSDP 2011–2016

To respond to the urgent need for reducing NCDs, improvement of imaging diagnostic services in seven MCHs has been considered. This involves some activities related to radiology imaging diagnosis as mentioned above. Therefore, the Survey Team integrated these activities and proposed the establishment of an “Imaging Diagnostic Center” in MCHs in each division.

Establishment of imaging diagnostic center is not planned in NCDC OP in HPNSDP 2011–2016 and this will be a long-term project beyond 2016; therefore, it is proposed as sub-projects beyond HPNSDP 2011–2016. Specifically, 3 sub-projects are proposed:

- 1) Provision of imaging diagnostic equipment
- 2) Construction of new imaging diagnostic centers meant to aid in the installation of imaging diagnostic equipment
- 3) Training in utilization of imaging diagnostic equipment

Since the imaging diagnostic center will be utilized for only examination purpose, medical treatment and medication should be provided at existing main buildings as it has always been in the past. Patients return to OPD or wards in the main buildings after examination at the imaging diagnostic center, to be diagnosed with their examination reports and be treated as routine. If various medical services including invasive treatment are provided at the imaging diagnostic center, it makes patient flow more complicated and it may create more confusion in hospital management.

### 6.2.3 Overall Sub-projects

The figure below shows a conceptual diagram of the proposed projects selected using the selection criteria.

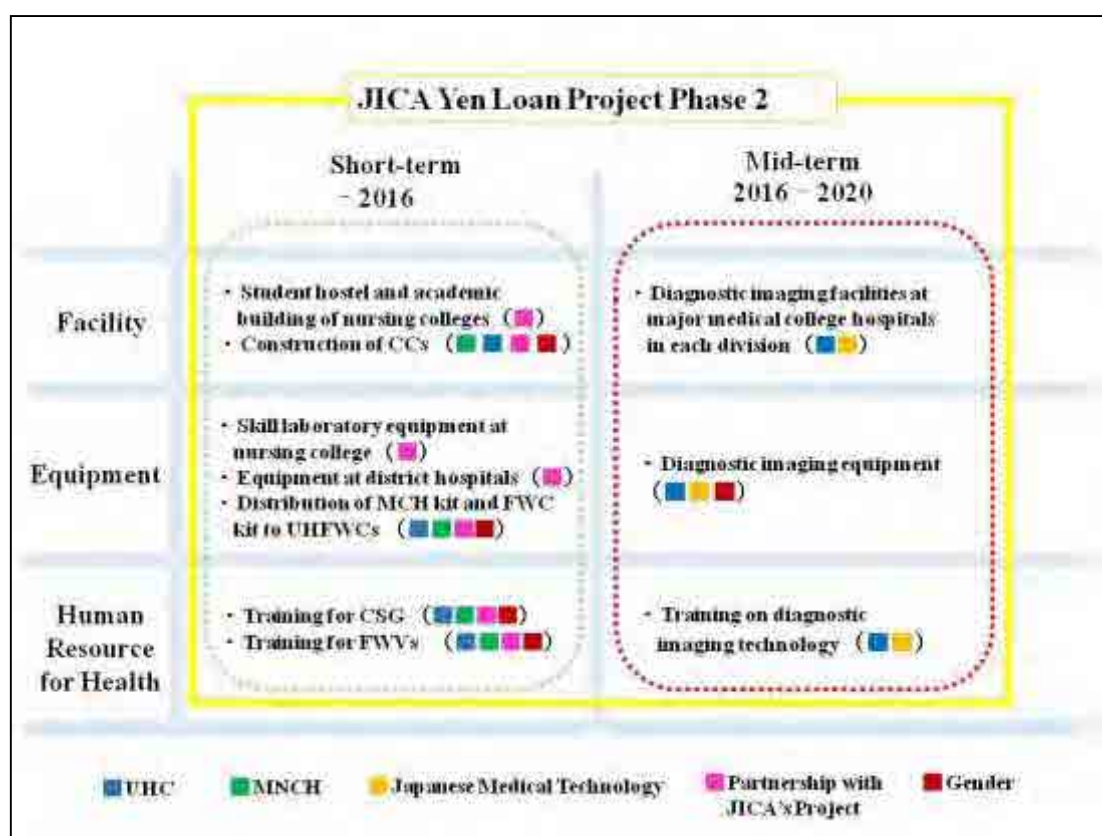


Figure 6-1: Concept of Selected Proposed Projects on the Yen Loan Project Phase 2

Source: prepared by the Survey Team

## **CHAPTER 7:**

### **Plan of the Project**



## CHAPTER 7: Plan of the Project

### 7.1 List of Sub-projects

The list of the sub-projects within and beyond the HPNSDP 2011-2016 is shown in the table below.

Table 7-1: List of the Sub-projects

Sub-projects	Target OP	Responsible
Sub-projects within the HPNSDP 2011-2016		
Training of community support group (CSG)	No.3 CBHC	DGHS
Midwifery Trainings for family welfare visitors (FWVs)	No.18 MCRAH	DGFP
Emergency Obstetric Care (EmOC) Trainings for FWVs	No.18 MCRAH	DGFP
Distribution of MCH kits and FWC kits to Union Health Family Welfare Centers (UHFWCs)	No.18 MCRAH	DGFP
Provision of medical equipment at the renovated and/or expanded DHs	No.9 HSM	DGHS
Provision of equipment for BSc nursing colleges	No.26 NES	DNS
Furniture for students' hostel building in BSc nursing colleges	No.26 NES	DNS
New construction of community clinics (CCs)	No.3 CBHC No.28 PFD	DGHS
New construction of students' hostel building in BSc nursing colleges	No.26 NES No.28 PFD	DNS DGHS
Extension of academic buildings in BSc nursing colleges	No.26 NES No.28 PFD	DNS DGHS
Sub-projects beyond the HPNSDP 2011-2016		
Provision of imaging diagnostic equipment in MCHs	N/A	DGHS
New construction of imaging diagnostic centers in MCHs	N/A	DGHS
Training to utilize imaging diagnostic equipment	N/A	DGHS

### 7.2 Sub-projects within HPNSDP 2011-2016

The sub-projects within the period of HPNSDP 2011-2016 are proposed during the second field survey. The selected sub-projects by activities (Facility, Equipment and Training) are shown in the table below.

Table 7-2: Sub-projects within the HPNSDP 2011-2016 by Activities

Activities	Sub-projects	JICA Policy	Target OP
Facility	New construction of female students' hostel building in 7 BSc nursing colleges	JICA project coordination	PFD NES
	Extension of academic buildings in 7 BSc nursing colleges	JICA Project Coordination	PFD NES
	Furniture for new buildings in 7 BSc nursing college	JICA Project Coordination	NES
	New Construction of 300 CCs (2 rooms)	UHC	CBHC PFD
Equipment	Installation of equipment for skill laboratory in 6 BSc nursing colleges	JICA Project Coordination	NES
	Distribution of MCH kit and FWC kit to UHFWCs	The Yen Loan Project Phase 1	MCRAH
	Installation of medical equipment at the renovated/ expanded 6 DHs supported by the Yen Loan Project Phase 1	The Yen Loan Project Phase 1	HSM
Training	Training of CSG in FY2015-2016	JICA Project Coordination (SMPP2)	CBHC
	Training for FWVs on midwifery	The Yen Loan Project Phase 1	MCRAH
	Training for FWVs on EmOC	The Yen Loan Project Phase 1	MCRAH
	TOTAL		

The Yen Loan Project Phase 2 would support 5 OPs in the HPNSDP 2011-2016 as follows.

- OP3: Community Based Health Care (CBHC), DGHS
- OP9: Hospital Services Management (HSM), DGHS
- OP18: Maternal, Child, Reproductive and Adolescent Health (MCRAH), DGFP
- OP26: Nursing Education and Services (NES), Directorate of Nursing Services (DNS)
- OP28: Physical Facility Development (PFD), MOHFW

The details of the sub-projects by activities are described below.

### 7.2.1 Health Facility

In this section, background and proposed/selected plan for the sub-projects of the Yen Loan Project Phase 1: extension of the administration and academic buildings, new construction of hostels for seven nursing colleges, which are planned as parts of within HPNSDP are described, and new construction of CCs, the design of which was prepared by the Bangladesh side as attached in Annex 12.

#### (1) Background

In order to accommodate increase in the number of students from 50 to 100 per grade, Administration and Academic Buildings, and hostels have been planned to be expanded under HNPSP and HPNSDP through two sub-projects: “Up-gradation of existing NTC to Nursing



College attached to 7 old Medical Colleges”<sup>1</sup> to build the Administration and Academic Buildings, and “Extension of Nursing female hostel attached in 7 old Medical Hospitals from 50 seats to 100 seats”<sup>2</sup> to build 250-bed hostels. Most of these construction works except for the construction of Administration and Academic Building in Barisal have been completed. The current situations of these two sub-projects are shown below.

Table 7-3: Current Situation of the Sub-projects:

“Up-gradation of Existing NTC to Nursing College Attached to 7 Medical Colleges”

Name of School	Location	Specification of the building	Status
College of Nursing, Dhaka Medical College	Dhaka	4 storied bldg with 6 story foundation	The building was built and handed over in June 2014.
College of Nursing, Mymensingh Medical College	Mymensingh	4 storied bldg with 4 story foundation	Semi-circular shaped building was built in 2012.
College of Nursing, MAG.Osmmi Medical College	Sylhet	4 storied bldg with 6 story foundation	Semi-circular shaped building was built in 2012.
College of Nursing, Rajshahi Medical College	Rajshahi	4 storied bldg with 6 story foundation, 9,200 sq. ft. per floor	Semi-circular shaped building was built in 2012.
College of Nursing, Rangpur Medical College	Rangpur	4 storied bldg with 6 story foundation, 30,000 sq. ft. per floor	Semi-circular shaped building was built in 2012.
College of Nursing, Sher-e-Bangla Medical College	Barisal	3 storied bldg with 6 story foundation	Construction work will be completed in Dec. 2014.
College of Nursing, Chittagong Medical College	Chittagong	4 storied bldg with 6 story foundation	Semi-circular shaped building was built in 2012.

Source: Prepared by the Survey Team

<sup>1</sup> Item No. 52, Implementing agency: PWD, Total cost: Taka 92lac, handed over by HNPSP

<sup>2</sup> Item No. 34, Implementing agency: PWD, Total cost: Taka 100lac, handed over by HNPSP

Table 7-4: Current Situation of the Sub-projects:

"Extension of Nurses Hostel Attached to 7 Medical Hospitals from 50 Seats to 100 Seats"

Name of School	Location	Specification of the building	Status
College of Nursing, Dhaka Medical College	Dhaka	6 story bldg with 6 story foundation	The building was built in 2012.
College of Nursing, Mymensingh Medical College	Mymensingh	6 story bldg with 6 story foundation	The semi-circular shaped building was built in 2012.
College of Nursing, MAG.Osmmi Medical College	Sylhet	6 story bldg with 6 story foundation	The semi-circular shaped building was built in 2012.
College of Nursing, Rajshahi Medical College	Rajshahi	6 story bldg with 6 story foundation, 2,627 sft per floor	The semi-circular shaped building was built in 2012.
College of Nursing, Rangpur Medical College	Rangpur	5 story bldg with 6 story foundation, 13,288 sft per floor	The semi-circular shaped building was built in 2012.
College of Nursing, Sher-e-Bangla Medical College	Barisal	3 <sup>rd</sup> floor on existing 2 <sup>nd</sup> floor, 4 story foundation	The building was built in 2012.
College of Nursing, Chittagong Medical College	Chittagong	4 story bldg with 6 story foundation	The semi-circular shaped building was built in 2012.

Source: Prepared by the Survey Team

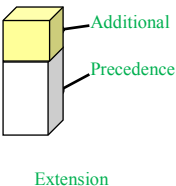
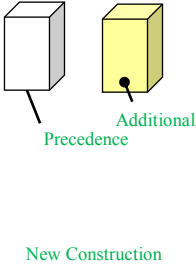
In accordance with the completion of construction works and an additional plan to increase the number of students from 100 to 150, it is planned to form a new sub-project temporarily named "Up-gradation and Renovation of Nursing Colleges and Hostels" under HPNSDP to expand the Administration and Academic Buildings and hostels for seven nursing colleges which are object nursing colleges of "Up-gradation of existing NTC to Nursing College attached to 7 old Medical Colleges": Dhaka Medical College, Mymensingh, Sylhet, Rajshahi, Rangpur, Barisal and Chittagong. This new sub-project will be approved to be added in the PFD OP in September 2014, applied to Planning Commission of Ministry of Planning by planning wing of MOHFW for approval to embark on this new sub-activity in around November to December 2014. The outline of this new sub-project, which consists of two sub-projects: 1) extension of the administration and academic buildings of nursing colleges and 2) new construction of hostels for nursing colleges, and comparison between the precedence project and the additional plan (sub-project) are described below.

Table 7-5: Outline of the Sub-project of the Additional Plan

Sub-project	Description
1) Extension of the administration and academic buildings of nursing college	2 story extension of the administration and academic building constructed under “Up-grading of existing NTC to Nursing College attached to 7 old Medical Colleges”
2) New construction of hostels for nursing colleges	New construction of 150-bed hostels.

Source: Prepared by the Survey Team

Table 7-6: Comparison between the Precedence Sub-project and the Additional Plan

Type of building	Item	Precedence sub-project	Additional plan (projected)
	Title of the Sub-project	Up-gradation of existing NTC to Nursing College attached to 7 old Medical Colleges	Up-gradation and Renovation of Nursing Colleges and Hostels
	Location/Target	Dhaka Medical College, Mymensingh, Sylhet, Rajshahi, Rangpur, Barisal Chittagong	Same as on the left.
	Contents of building works	New construction of 4 story buildings with 6 story foundations	2 stories extension of the Administration and Academic Building constructed under the precedence plan described on the left.
	Title of the Sub-project	Extension of Nurses Female Hostel Attached to 7 Old Medical Hospitals from 50 seats to 100 seats	Up-gradation and Renovation of Nursing Colleges and Hostels at <name of divisions>
	Location/Target	Sir Salimullah, Mymensingh, Sylhet, Rajshahi, Rangpur, Barisal Chittagong	Faculty of Nursing in Dhaka Medical College, Mymensingh, Sylhet, Rajshahi, Rangpur, Barisal Chittagong
	Contents of building works	New construction of 4 to 6 story hostels with 6 story foundations, or one floor extension on existing hostel	New construction of hostels with 150-160 seat

According to the survey result described in 4.3, there are very few male students in nursing colleges (See Table 4-18 in Chapter 4). The ratios of male students to total students in each nursing college are 5.6% at minimum and 10.0% at maximum. Barisal, Dhaka and Rangpur Nursing Colleges have male student's hostels with not much occupancy. The male students in the nursing colleges without hostels can manage their stay at the hostels in Medical College or rent a room. The occupancy of female hostels is higher than male and the condition is more

critical. Therefore, up-gradation of female hostel is prioritized in this sub-project.

## (2) Proposed plan

### 1) Site condition

#### i) Dhaka Division

Dhaka City is the divisional headquarters of the Dhaka Division which is located in the center of Bangladesh and shares its borders with Gazipur and Tangail to the north, Munshiganj and Rajbari to the south, Narayanganj to the east and Manikganj to the west.

Dhaka Medical College campus, which includes the site of nursing college, is located in the western zone of Dhaka Metropolitan City. The land area of about 109,266 sq. m is bounded by the Shahid Minar - the Monument of Language Movement and the Dhaka University (DU) in the north and the east, the bazaar area in the south and the Bangladesh University of Engineering and Technology (BUET) in the west. Being situated mainly in the academic zone of the metropolitan city, physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage, gas supply network and telecommunication network are developed and in place. Access to and exit from site is quite well defined and caters efficiently for the site. The geographic and demographic data is shown below.

Table 7-7: Geographic and Demographic Data of Dhaka

Item	Data
Population (Census 2011)	47,424,418
Population density (2011)	1,500/sq. km
Temperature (Maximum, minimum)	Max. 34.5 degrees C, min. 11.5 degrees C
Average annual rainfall	1,931 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

#### ii) Mymensingh District

Mymensingh, one of the districts of Dhaka Division, is located in the north part of Dhaka Division bordering India.

Mymensingh Medical College campus, where the nursing college is located, was established in 1924 as the 3rd medical school of the region in order to meet the needs of the growing population.

Being situated mainly in the city, all physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage, gas supply network and telecommunication network are all developed

and in place. The geographic and demographic data is shown below.

Table 7-8: Geographic and Demographic Data of Mymensingh

Item	Data
Population (Census 2012)	5,110,272
Population density (2012)	1,200/sq. km
Temperature (Maximum, minimum)	Max. 33.4 degrees C (May), min. 11.0 degrees C (January)
Average annual rainfall	2,249 mm

Note: All data including population and population density are district-base.

Source: Prepared by the Survey Team

### iii) Sylhet Division

Sylhet City is the divisional headquarters of Sylhet Division which is located in the north-east of Bangladesh and is bordered with Dhaka to its west, Chittagong to its south-west, Assam in India to its east, Tripura in the south and the Bangladesh districts in the west. It lies on the banks of the Surma River.

MAG Osmani Medical College campus, which includes the site of nursing college, is located the north-eastern city of Sylhet.

Since it is situated in the city, main physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage, gas supply and telecommunication network are developed and in place. Geologically, the region is complex having diverse sacrificial geomorphology; high topography of Plio-Miocene age such as Khasi and Jaintia hills and small hillocks along the border. At the center there is a vast low laying flood plain of recent origin with saucer shaped depressions, locally called Haors. Available limestone deposits in different parts of the region suggest that the whole area was under the ocean in the Oligo-Miocene. In the last 150 years three major earthquakes have hit the city, at a magnitude of at least 7.5 on the Richter Scale, the last one taking place in 1918, although many people are unaware that Sylhet lies on the earthquake prone zone of Bangladesh. The geographic and demographic data is shown below.

Table 7-9: Geographic and Demographic Data of Sylhet

Item	Data
Population (Census 2011)	9,910,219
Population density (2011)	780/sq. km
Temperature (Maximum, minimum)	Max. 29.0 degrees C, min. 19.0 degrees C
Average annual rainfall	4,067 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

#### iv) Rajshahi Division

Rajshahi Division is located in the mid-western corner of Bangladesh. The famous river Padma borders Rajshahi Division on the south and another famous river, Jamuna, lies across the eastern border. In the West, Rajshahi Division shares a border with India. This division is characterized by its cheap labor force. It has an excellent rail and road communication infrastructure. It takes only six to seven hours by road from Dhaka, the capital city. Until 2010 this division comprised 16 districts, but early in that year it was divided into two, when a new division (Rangpur Division) was formed out of the 8 northerly districts that until then had been part of Rajshahi Division. Historically Rajshahi was dominated by various Rajas, Maharajas and Zamindars.

Rajshahi city, the divisional headquarters of Rajshahi Division, is along the river Padma to the south. The river Padma, the most significant river in Bangladesh is a major trans-boundary river known in India as the main distributary of the Ganges river that originates in the western Himalayas.

Rajshahi Medical College campus, which includes the site of nursing college, is located along the river Padma in the Rajshahi City. Rajshahi MCH is a large hospital which is the central provider for achieving health care in the northern part of Bangladesh. Physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage and telecommunication network are developed and in place. The four sides of this hospital are bounded by roads. Greater Road is at the west side, Station Road at north side, Medical Road at south side and Ghosh Para Road at east side of the campus. Access to and exit from site is quite well defined and caters efficiently for the site. The geographic and demographic data is shown below.

Table 7-10: Geographic and Demographic Data of Rajshahi

Item	Data
Population (Census 2011)	18,484,858
Population density (2011)	1,000/sq. km
Temperature (Maximum, minimum)	Max. 35.9 degrees C (April), min. 18.5 degrees C (January)
Average annual rainfall	1,419 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

#### v) Rangpur Division

Rangpur Division became Bangladesh's 7th division in January 2010. Before that, it had been the northern eight districts of the Rajshahi Division. To meet the growing needs of modern medicine, the Government of East Pakistan established a Medical College in the south

part of Dhapa, Rangpur on the property for Pandi Family of Rangpur in 1970 with a 500-bed teaching hospital. West of the hospital is the Dhaka to Dinajpur highway whereas the east side is bounded by Gangachara road. The main city starts from this MCH. Rangpur city pass and bypass starts at south side of MCH. All physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage and telecommunication network are all developed and in place. The geographic and demographic data is shown below.

Table 7-11: Geographic and Demographic Data of Rangpur

Item	Data
Population (Census 2011)	15,787,758
Population density (2011)	980/sq. km
Temperature (Maximum, minimum)	Max. 32.0 degrees C, min. 11.0 degrees C
Average annual rainfall	2,931 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

#### vi) Barisal Division

Barisal City, now the headquarters of both the Barisal Division and the Barisal District, is an old port on the Kirtankhola River, on the northern shore of the Bay of Bengal in southern Bangladesh. It is bounded by Dhaka Division on the north, the Bay of Bengal on the south, Chittagong Division on the east and Khulna Division on the west.

Barisal Medical College campus, which includes the site of nursing college, is located in the Barisal City and its main gate is bordering to the south from Brand Road, one more gate for staff quarters is boarding to the east side from Bells Park Lake Road.

Access to and exit from site is quite well defined and caters efficiently for the site. Physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage and telecommunication network are developed and in place. The geographic and demographic data is shown below.

Table 7-12: Geographic and Democratic Data of Barisal

Item	Data
Population (Census 2011)	8,325,666
Population density (2011)	630/sq. km
Temperature (Maximum, minimum)	Max. 33.0 degrees C (April-May), min. 19.0 degrees C (January)
Average annual rainfall	2,127 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

#### vii) Chittagong Division

Chittagong, the premier port and industrial center of Bangladesh, is the second largest city in Bangladesh, and located with Barisal to its west, Dhaka to its north west, Sylhet to the north east, Mizoram of India to the east, Myanmar to the south east and the Bay of Bengal to the south west. Chittagong City is the divisional headquarters of the Chittagong Division which is located on the banks of the Karnaphuli River in the south-eastern region of Bangladesh.

Chittagong Medical College campus, which includes the site of nursing college, is located in the Chittagong Metropolitan City. Chittagong MCH is one of the large hospitals in the south part of Bangladesh. The campus is surrounded by K.B. Fazlul Kader Road from north-east corner to west side of the campus and there are four gates to access the campus. Physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage and telecommunication network are developed and in place.

The geographic and demographic data is shown below.

Table 7-13: Geographic and Demographic Data of Chittagong

Item	Data
Population (Census 2011)	28,423,019
Population density (2011)	840/sq. km
Temperature (Maximum, minimum)	Max. 32.3 degrees C (May), min. 13.9 degrees C (January)
Average annual rainfall	2,919 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

#### 2) Layout plan

##### i) Extension of the Administration and Academic Buildings of Nursing Colleges

Existing Administration and Academic Buildings which are targeted to be extended by another two floors of each nursing college are shown in Annex 13.

##### ii) New construction of hostels for Nursing Colleges' students

Candidate site was confirmed with each nursing college during the 2nd Field Study. The current condition of each candidate site is described in Table 7-14 and its location is shown in Figure 7-1 to Figure 7-7.



Table 7-14: Current Condition of Each Proposed Candidate Site for New Construction of Nursing Colleges Hostels

Name of School	Location of candidate site	Current status	Remarks
College of Nursing, Dhaka Medical College	A part of hostels area in nursing college bordering the arterial road to its west side, existing hostels to its north and east sides, and vacant space to its south side.	Wasteland	Need to weed.
College of Nursing, Mymensingh Medical College	A part of vacant space bordering the arterial road, which there is a main gate to the medical college campus at the opposite side of the arterial road. There are also an elevated reservoir tank and hostels for staff peripherally located.	Vacant site	No obstacles to be demolished.
College of Nursing, MAG.Osmmi Medical College	A part of the north end of the campus, bordering new building of the nursing college to its east side, main building to its south side, and playground to its south.	Vacant site	No obstacles to be demolished.
College of Nursing, Rajshahi Medical College	A space bordering the on-campus road to its west side and the main building of the nursing college to its east side. There is the hospital-1 building at the opposite side of the on-campus road.	There is a one-story building.	Need to demolish an existing building.
College of Nursing, Rangpur Medical College	A part of north-west area bordering the arterial road to its east side and on-campus road to its north side.	There are four one-story buildings.	Need to demolish existing buildings.
College of Nursing, Sher-e-Bangla Medical College	East side of the main building of the nursing college. Three-way: north, west and south sides are open to on-campus roads.	Vacant site	No obstacles to be demolished.
Name of School	A part of hostels in the end of west side of the campus, bordering outside to its west, on-campus road to its east, vacant space to its south, and suspended construction site to its north.	Vacant site	No obstacles to be demolished. There are spare sites in north-south sides.

Source: Prepared by the Survey Team

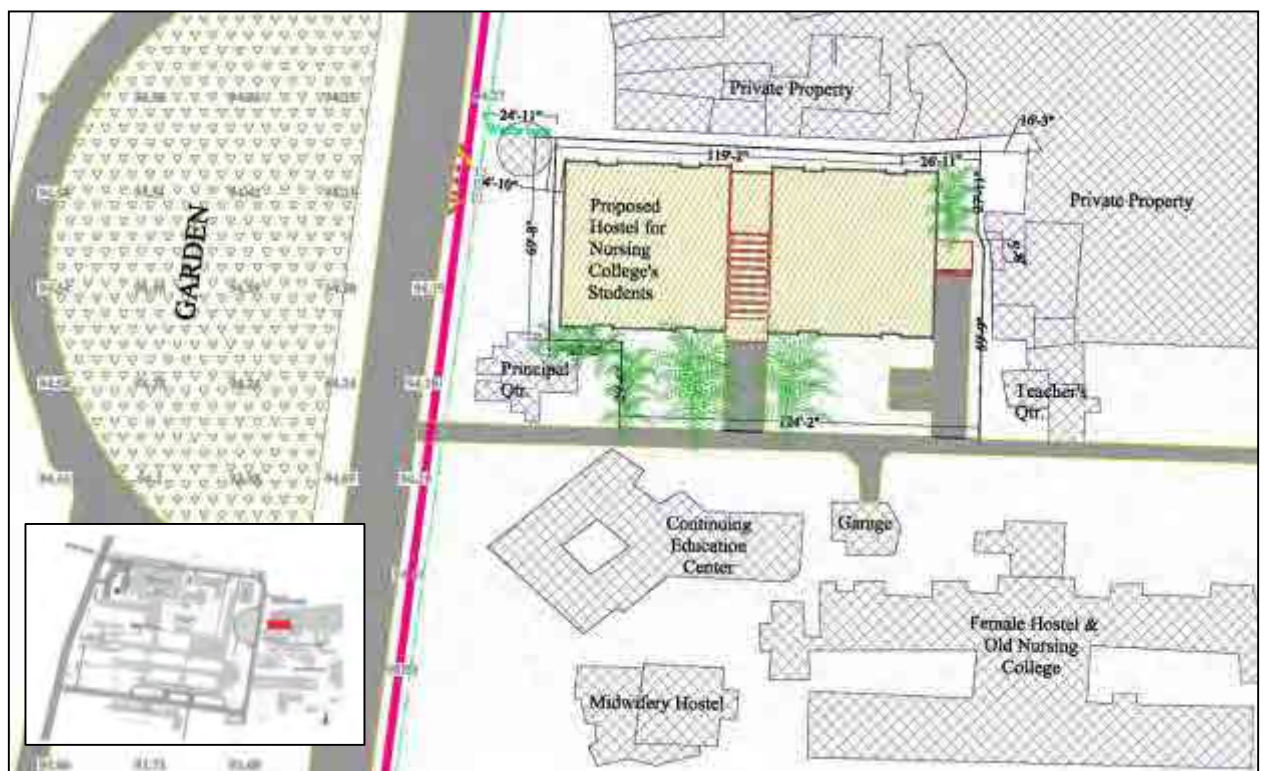
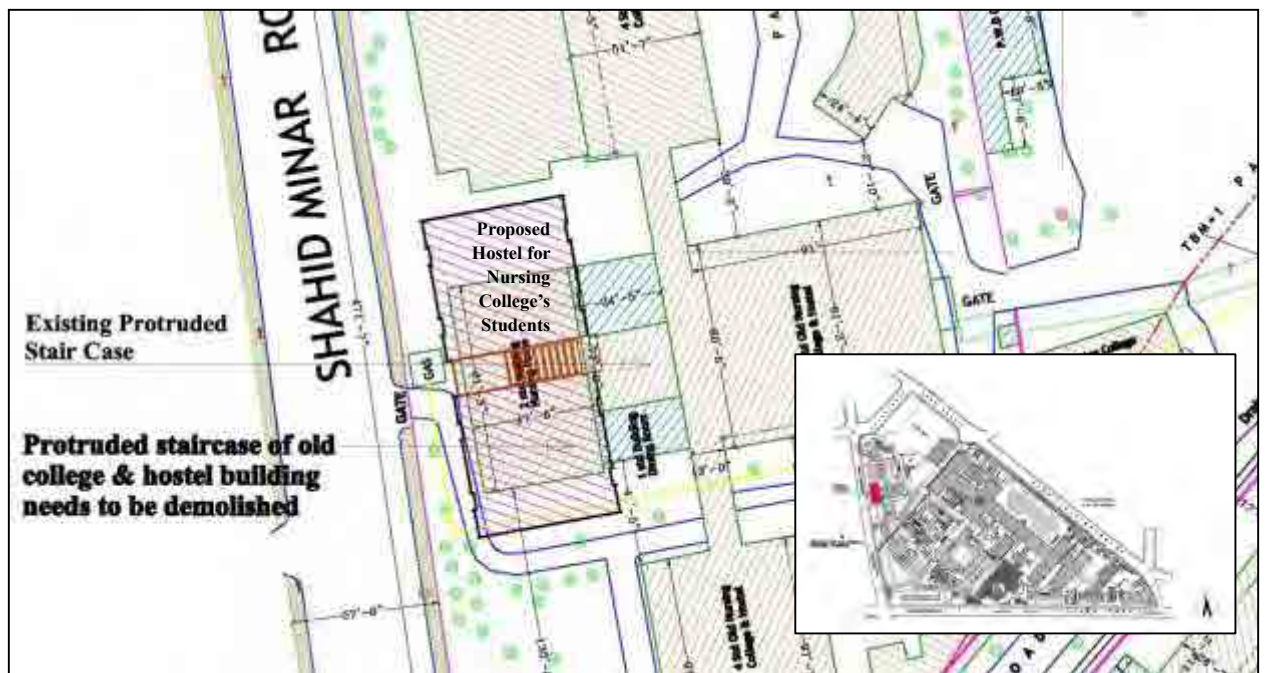




Figure 7-3: Candidate Site's Location and Layout Plan for Construction of the Nursing College in Sylhet

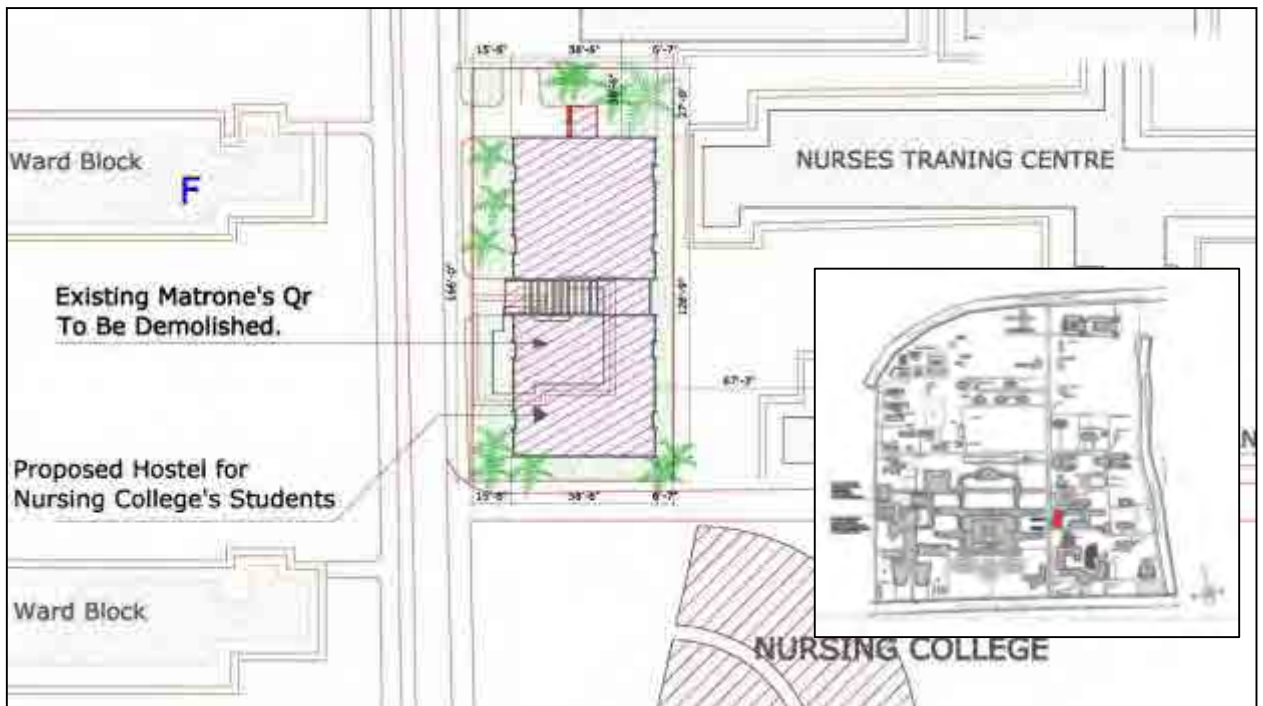


Figure 7-4: Candidate Site's Location and Layout Plan for Construction of the Nursing College in Rajshahi

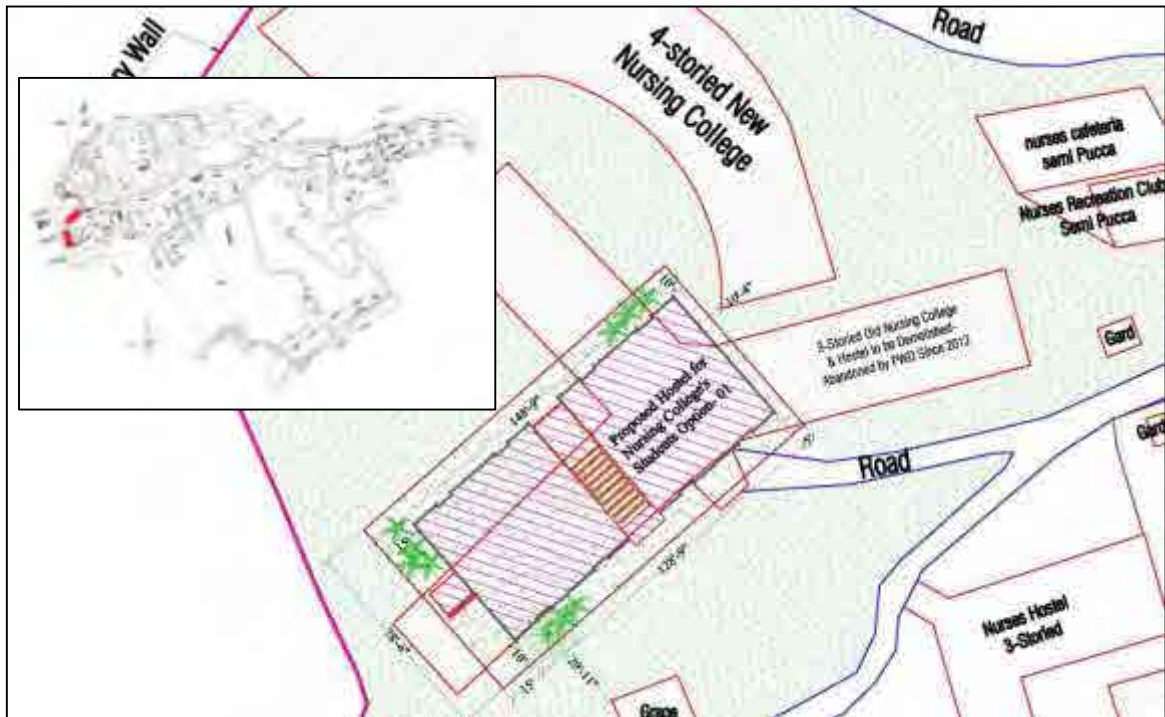




Figure 7-5: Candidate Site's Location and Layout Plan for Construction of the Nursing College in Rangpur



Figure 7-6: Candidate Site's Location and Layout Plan for Construction of the Nursing College in Barisal



Option-1



Option-2

Figure 7-7: Candidate Sites' Locations and Layout Plans for Construction of Nursing College in Chittagong (Option-1 and 2)

### (3) Design policy

Since currently design works for a new construction of hostel have not been started yet by the Bangladesh side, the Survey Team prepared one option based on the design policy described below.

#### Design Policy for Hostels for Nursing Colleges' students

- Amenity  
As residences for students, they will provide comfortable living and study spaces.
- Easy maintenance  
Taking into account resources for maintenance, they should have a sustainable design, e.g. eco-friendly- having large opening such as windows for efficient natural ventilation.

### (4) Floor plan

Typical floor plan to be extended on the existing Administration and Academic Building for nursing college is shown in Annex 13, and the prototype of floor plan for new nursing college Hostel is shown in Annex 12.

## 7.2.2 Medical Equipment

### (1) DH equipment

A survey is being conducted on the construction progress for the DHs listed in the table below in the Yen Loan Project Phase 1 by that is currently being implemented. This construction work is proceeding with the goal of completion around June 2016, but since medical equipment will be needed to open the hospitals after construction is completed, a review was conducted regarding procurement funds for the Yen Loan Project Phase 2 by for which a survey is currently being conducted.

Table 7-15: List of DHs Being Upgraded

No.	DHs	Existing Beds	Upgrade Level	Information
1	Gazipur	100-bed level	500-bed level	Medical College was begun in 2014
2	Manikganj	100-bed level	500-bed level	Medical College will start in 2015
3	Munshinganj	100-bed level	250-bed level	-
4	Barguna	100-bed level	250-bed level	-
5	Bargerhat	100-bed level	250-bed level	-
6	Satkhira	100-bed level	Operation Theater only	-

The Survey Team received instructions to use the equipment list that is being newly prepared by Line Director of HSM OP, who is in charge of determining the required standard equipment for the respective approximate number of beds (bed level) at these hospitals. This list was reviewed and prepared by a committee consisting mainly of 1) the Management Service for Health (MSH), the implementation agency for the System for Improved Access to

Pharmaceutical Services (SIAPS) project by the USAID to support the Ministry of Health and Family Welfare and, 2) its supervisor, Additional Secretary (Dev. & ME), DPM (Logistics Management), PLMC. A standard hospital equipment list has been prepared for up to 250 beds at the present time (see Annex 14). However, plans call for the preparation of an equipment level for a 500-bed level MCH which could not to be reviewed and verified at the committee meeting in September 2014 and it was postponed to the next meeting. The same instructions were received concerning use of this equipment list upon checking with the Line Director of CMSD, which is the agency responsible for procurement of equipment. At the present time, the CMSD standard procurement prices in the 250-bed standard equipment list are being used to plan a budget for the total cost. However, this list specifies quantities and units, and if equipment was supplied as specified in the list, it would result in the need for a huge volume of equipment, and is therefore not practical. For example, the list specifies that one set consisting of a gas cylinder oxygen, flow meter with accessories and trolley for gas cylinder be provided for every two beds in the Cardiology Ward, but this means that 20 sets would be required if the ward had 40 beds. Normally, in a hospital of this level, oxygen is supplied through central piping to oxygen supply outlets on the wall beside the bed of patients who require oxygen since it is dangerous to place many individual oxygen cylinders in the hospital. In addition, radiology equipment normally consists of analog X-ray equipment, but the provision of a CR system, mobile X-ray, general X-ray, fluoroscopy as well as Open MRI and 64-slice CT scanner for a 250-bed level hospital is not practical from the prospects of securing the necessary personnel and budget since a number of 500-bed level MCHs do not even have this level of equipment. Regarding the content of equipment, rather than simply approve the quantity of equipment in a mechanical manner, it will be necessary to conduct a detailed review which includes personnel arrangements and the utilization of existing equipment. The line director of HSM and director of CMSD understood the list of equipment and revised HSM OP.

## (2) Skill laboratory equipment for nursing college

One major issue in the health care field in Bangladesh consists of an inadequate number of nurses. Plans to increase the number of nurses being trained at nursing colleges are proceeding, but the level of facilities and equipment remains inadequate. The provision of funds for skill laboratory equipment for nursing colleges is being considered for this project in order to help educate nurses.

Up to this point, equipment for the following seven skill laboratories was considered based on the results of the field surveys at BSMMU Nursing College, Rangpur Nursing College, Barisal Nursing College and Dhaka Nursing College under section 4.2.4 Skill Laboratory Equipment

for Nursing College in Chapter 4. See Table 4-13. There are other fields, such as English Skill, Medical & Surgical, Pediatric and Orthopedic, but consent has been obtained from the respective nursing colleges that these and other fields would not be considered at this point in time. And some of equipment will be supplied by other donors; for example, microscope and desktop computer which are out of the list. Therefore, the Survey Team considered to procure higher priority of school equipment which is a business machine to support for school management.

Table 7-17: Skill Laboratory and Equipment

No.	Skill	Description	Equipment
1	Fundamental Nursing	Patient Care	Patient Care Simulator, Medical Equipment
2	Nutrition and Diet	Food Management	Food Model, Caloric Calculation
3	Microbiology	Sanitary Management	Microscope, Sterilizer
4	Physiology	Human Body System	Human Body System Model and Chart
5	Anatomy	Human Body Parts	Human Body Parts Model and Chart
6	Midwifery	Obstetric Management	Delivery Simulator, Baby Care Simulator
7	Computer	Common Knowledge	Desktop Computer and Monitor

A skill laboratory equipment list was first obtained from the Dhaka Nursing College, received via the JICA Bangladesh Office. In this list, the Survey Team added some more equipment thought to be necessary through the survey at each of the nursing colleges. The content of the revised list was reviewed by Principal of Dhaka Nursing College and Director of DNS, in charge of equipment, to verify the details including number of pieces, prepared the final proposal. The final proposal was reviewed by the officer of DNS, to confirm the details. Finally, it was confirmed that DNS to subtract equipment from the final proposal and to procure a certain amount of them for each college. The equipment list for skill laboratory was finalized in this manner.

### (3) Distribution of MCH kits and FWC kits

MCRAH OP is responsible for this distribution of 50 MCH kits and 50 FWC kits to 50 UHFwCs. 1 MCH kit and 1 FWC kit will be distributed to each UHFwC. Those kits are used for providing MNCH and primary health services at Union level. The lists of kits are available in Annex 16.

### 7.2.3 Training

3 training courses in 2 OPs are proposed as the sub-projects within HPNSDP 2011-2016. Basically, they have been supported by the Yen Loan Project Phase 1 and SMPP2. There is a need of continuous support by the Yen Loan Project Phase 2.



#### (1) CBHC OP

According to the interview with the LD of CBHC OP, CHCP training for 800 newly recruited persons in FY2014-2015 will be funded by the pool fund. CG and CSG training are required every 2 years because new groups shall be formed every 2 years. CG training for 212,500 persons in FY2014-2015 and for 23,137 in FY2015-2016 will be funded by the pool fund as well. CSG training for 706,911 persons in FY2015-2016 is proposed to be funded continuously by the Yen Loan Project Phase 2. Since the duration of CSG training will be extended from 1 day to 2 days for responding to the demand of busy CSG members, the training cost will be increased.

#### (2) MCRAH OP

Training for FWVs on Midwifery and EmOC will be conducted until the end of HPNSDP. Since the pledged amount of the fund supported by the Yen Loan Project Phase 1 was used 100%, there is a need of continuous funding support by the Yen Loan Project Phase 2. The target numbers of participants and estimated cost of the training in FY2014-2016 proposed by the LD of MCRAH OP are shown in the table below. The training will be provided at Maternal and Child Health Training Institute (MCHTI), Mohammadpur Fertility Services and Training Centre (MFSTC), Obstetrical and Gynecological Society of Bangladesh (OGSB) Hospital, Chittagong MCH and MCWC. According to the opinion of the LD of MCRAH, the training in rural divisions should be conducted at MCHs in divisions, however, the MCHs are managed under DGHS, not DGFP. It will take a long time to coordinate with DGHS and MCHs for this arrangement.

Table 7-19: Description of Training for FWV Proposed by MCRAH OP

Training	No. of participants		
	FY2014-2015	FY2015-2016	Total
Midwifery	200	100	300
EmOC	80	40	120

### 7.3 Sub-projects beyond HPNSDP 2011-2016

#### 7.3.1 Health Facility

In order to establish a new imaging diagnostic system in the hospital, an imaging diagnostic building is planned to be newly constructed for each of the seven MCHs. The proposed plan is described as below.

#### (1) Site condition

Six sites out of the total seven sites are located in the same campuses as the sub-projects under

HPNSDP described above in 7.2.1. The following table shows construction works planned under the Yen Loan Project Phase 2 by site.

Table 7-20: Construction Sites by Sub-projects under the Yen Loan Project Phase 2

Site \ Sub-project	Up-grading and Renovation of Nursing Colleges and Hostels	Construction of Imaging Diagnostic Center
Dhaka Medical College	Included	Included
Mymensingh	Included	Not included
Sylhet	Included	Included
Rajshahi	Included	Included
Rangpur	Included	Included
Barisal	Included	Included
Chittagong	Included	Included
Khulna	Not Included	Included

Source: Prepared by the Survey Team

i) Sites except Khulna

The information about site condition except Khulna is presented in 7.2.1, (2), 1).

ii) Khulna

Khulna is the third-largest urban area behind Dhaka and Chittagong and is situated in the south-west of Bangladesh. It is one of the oldest river ports in Bangladesh and includes parts of the Ganges River Delta or Greater Bengal Delta. Other rivers include the Madhumati River, the Bhairab River and the Kopotokkho River. The region also includes several islands in the Bay of Bengal. It is regarded as the gateway to the Sundarbans, the world's largest tidal forest and home of the Bengal Tiger. Khulna is also situated north of the Historic Mosque City of Bagerhat, a UNESCO World Heritage Site. Khulna division borders the Indian state of West Bengal to the west, the Rajshahi Division to the north, the Dhaka and Barisal Divisions to the east, and has a coastline on the Bay of Bengal to the south.

Khulna Medical College and Hospital, which is located in Khulna city, was established in 1992 with only a little infrastructure and is proceeding to develop its infrastructure including facilities. The campus stretches for a long distance in a north-south direction and its south side with main gate faces a main city road. Physical infrastructure e.g. roads, electricity, water supply, sewerage and drainage and telecommunication network are developed and in place. The geographic and demographic data is shown below.

Table 7-21: Geographic and Demographic Data of Khulna

Item	Data
Population (Census 2011)	15,687,759
Population density (2011)	700/sq. km
Temperature (Maximum, minimum)	Max. 33.1 degrees C (May), min. 12.4 degrees C (January)
Average annual rainfall	1,809 mm

Note: Population and population density are division-based data, and others are city-based data.

Source: Prepared by the Survey Team

## (2) Layout plan

Candidate site was confirmed with each Medical College during the 2nd Field Study. The current condition of each candidate site is described in Table 7-22 and its location and site layout plan are shown in Figure 7-8 to Figure 7-14.

Table 7-22: Current Condition of Each Candidate Site for Construction of the Imaging Diagnostic Center

Location	Location of candidate site	Current status	Remarks
Dhaka	Three sides are surrounded by the hospital building-1, and another side is bordering to internal road looking to the hostels area for the medical college.	Across three areas: existing the imaging diagnostic department building, wasteland and parking area	Need to demolish the 2-story building and the 1-story building including existing the imaging diagnostic department building.
Chittagong	Three sides are surrounded by the hospital building-1, and another side is bordering to the main internal road.	Across two areas: vacant site and existing staff hostels	Need to demolish the 2-story staff hostel.
Khulna	The east side from the main gate, which it is located from the east to south side of the hospital building-A. It is the space surrounded by the internal road and garden.	Vacant site	The recommended site space is not sufficient to adopt the prototype of the Imaging Diagnostic Center. On the other hand, there is a possibility to find another construction site option.
Sylhet	The east side from the main gate, which it is located in the front of the hospital building-1.	Garden	No obstacles to be demolished.
Rajshahi	The north side of the outpatient building which is connected to the gate.	Vacant site	No obstacles to be demolished. 2 options of candidate site
Rangpur	A part of the playground located in the north-west corner of the campus. A part of the construction site which has been suspended since the 1970's bordering the ICU building to its south side.	Across two areas: vacant site and construction site suspended	Need to demolish the suspended construction site. 2 options of candidate site
Barisal	The east side from the main gate, which it is located in the front of the hospital building-1.	Garden	No obstacles to be demolished.

Source: Prepared by the Survey Team

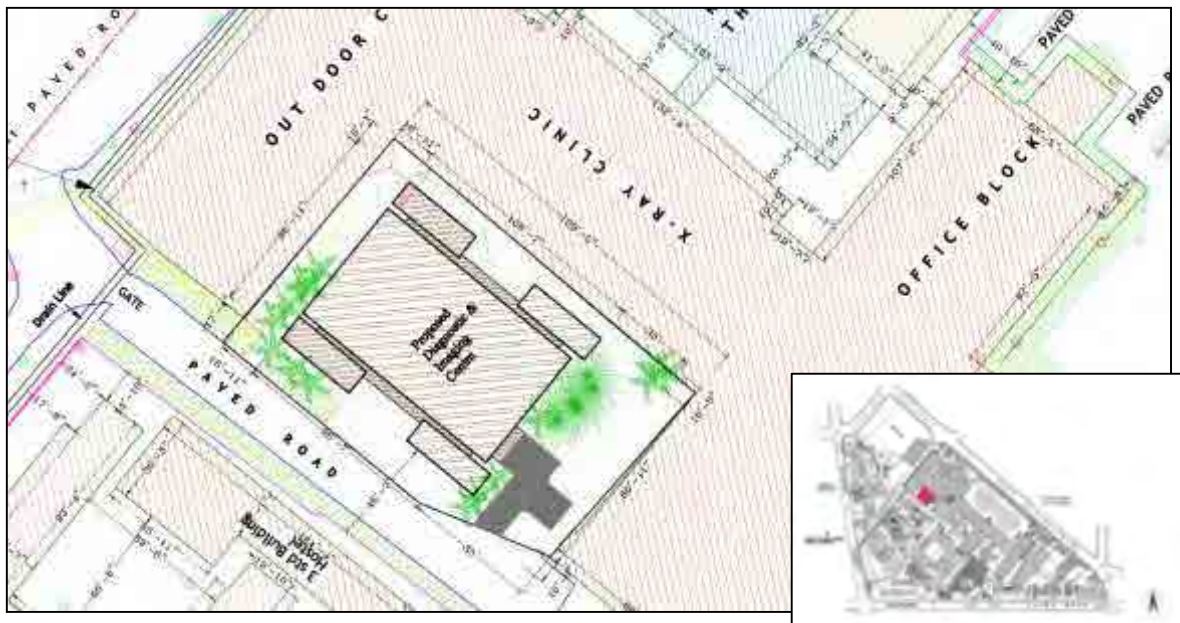


Figure 7-8: Candidate Site's Location and Layout Plan for Construction of the Imaging Diagnostic Center in Dhaka MCH

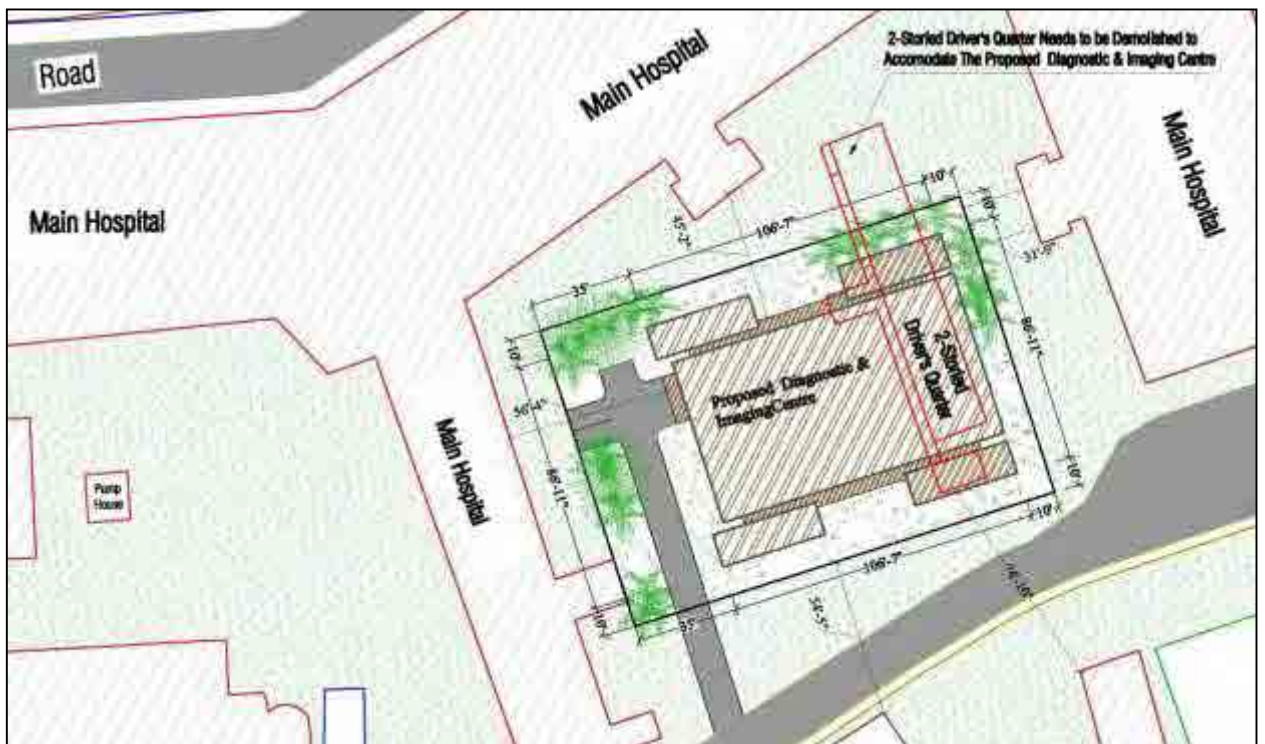


Figure 7-9: Candidate Site's Location and Layout Plan for Construction of the Imaging Diagnostic Center in Chittagong

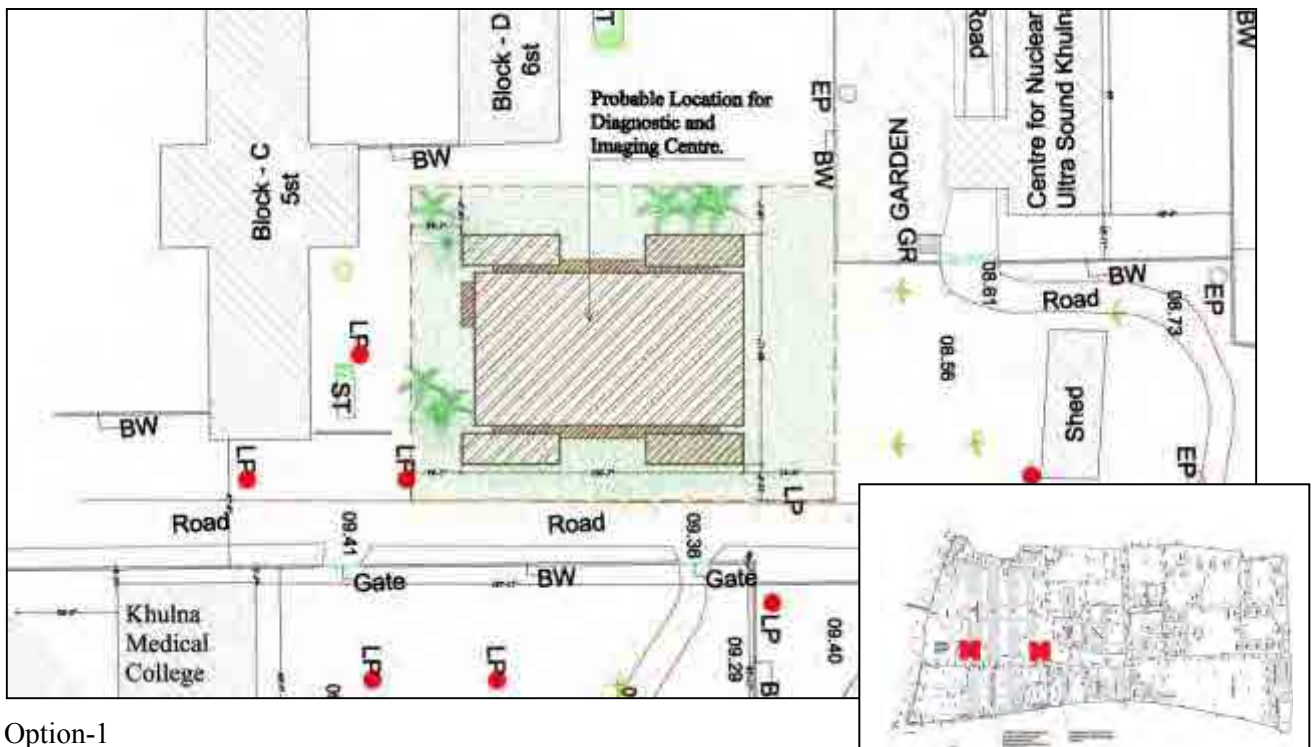


Figure 7-10: Candidate Site's Location and Layout Plan for Construction of the Imaging Diagnostic Center in Khulna (Option-1 and 2)

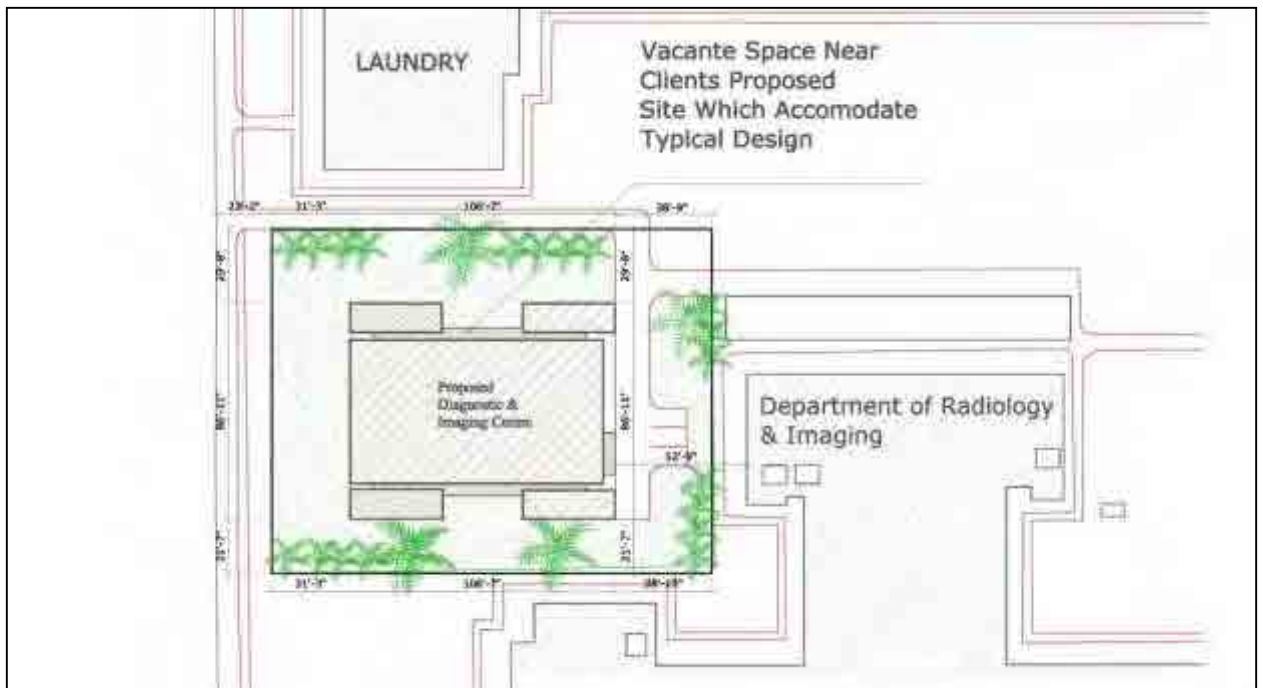




Figure 7-11: Candidate Site's Location and Layout Plan for Construction of the Imaging Diagnostic Center in Sylhet

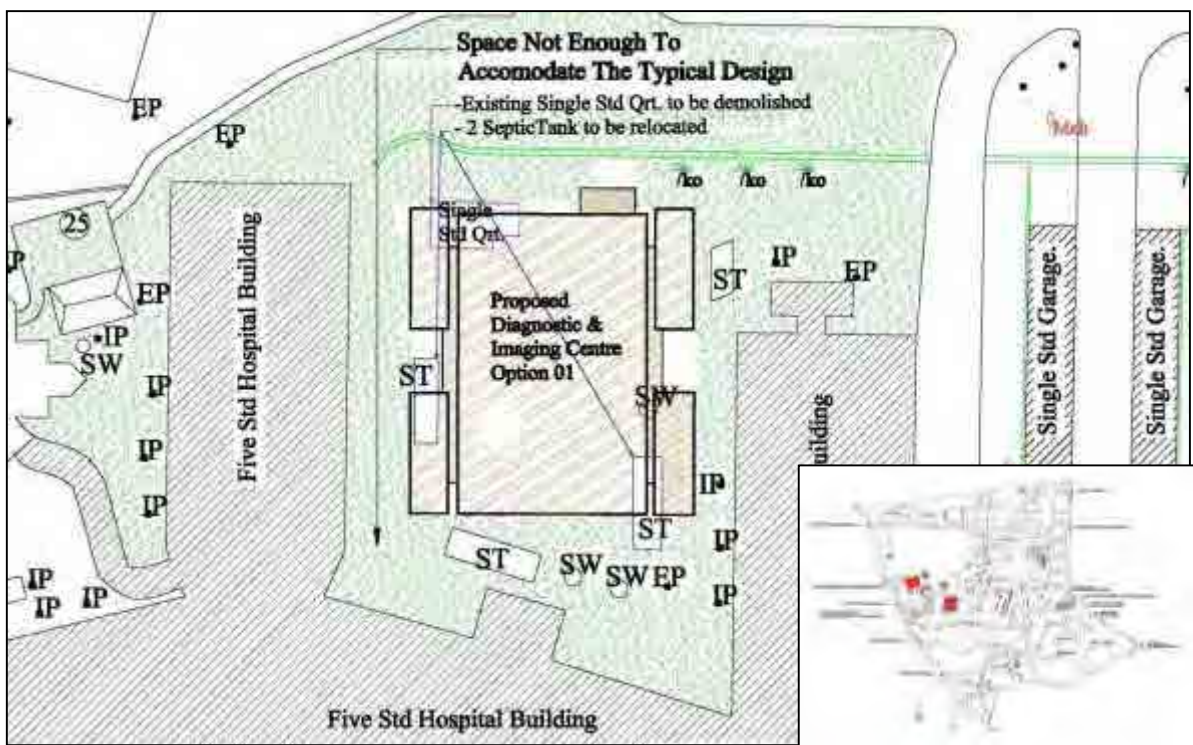


Option-1



Option-2

Figure 7-12: Candidate Sites' Locations and Layout Plans for Construction of the Imaging Diagnostic Center in Rajshahi (Option-1 and 2)



Option-1





Option-2

Figure 7-13: Candidate Sites' Locations and Layout Plans for Construction of the Imaging Diagnostic Center in Rangpur (Option 1 and 2)



Figure 7-14: Candidate Site's Location and Layout Plan for Construction of the Imaging Diagnostic Center in Barisal



### (3) Design policy

The specific imaging diagnostic equipment will be installed in the building when it is needed. The facility is not only planned to provide advanced medical treatment, but is also expected to contribute to medical education and innovation as a part of the MCH buildings.

Design Policy for facility planning: Achieving User-friendly, Advanced Medical Services and being Eco-friendly

- User-friendliness shall be established in view of incorporating the patient's and health care professional's perspectives.
- Foreseeing the future needs of health care services in Bangladesh, the facility shall have highly advanced medical equipment which allows for high-quality medical care.
- Towards the sustainable building operation and maintenance, eco-friendliness is considered at every stage from design to construction supervision.

In the basic policy for facility design, the following five aspects shall be the basic principles;

1. Safety
2. Amenity
3. Legibility of space
4. Ease of Maintenance
5. Flexibility

Each aspect is elaborated in the following.

	Safety
	<p>Safety can consist of (1) daily safety and (2) safety in times of emergency, such as when a disaster strikes.</p> <p>[Daily safety measures]</p> <ul style="list-style-type: none"> <li>■ Selection of anti-slipping floor material This prevents patients from falling.</li> <li>■ Floor planning with excellent visibility</li> <li>■ Hospital-specific measures Radiation protection/Hospital infection prevention</li> <li>■ Anti-theft measures</li> </ul> <p>[Safety measures in emergency situations]</p> <ul style="list-style-type: none"> <li>■ Plans shall be made to minimize human casualties as well as to design the facility to perform necessary functions. Moreover, various arrangements shall be made to ensure the proper functioning of the facility as a hospital, as exemplified by the installation of water and electricity storage for emergencies. <ul style="list-style-type: none"> <li>✓ Fire preparedness: first-aid/firefighting/fire spreading prevention/emergency preparedness management/information management/securing evacuation routes/improved facility for refugee accommodation etc.</li> <li>✓ Earthquake preparedness: seismic isolation structure/improving earthquake resistance of equipment and plumbing/measures to prevent non-structural sub-projects (such as ceilings) from falling etc.</li> </ul> </li> </ul>
	Amenity
	<p>It is important to understand the needs and requirements of the user, and provide a comfortable environment for the patient, the visitor, and the healthcare/medical worker in any situation inside the facility. In particular, the temperature, humidity, area, brightness, and extent of quietness are to be carefully examined.</p> <ul style="list-style-type: none"> <li>■ The facility with hospitality From “treating the disease” to “healing the patient”</li> <li>■ Realization of a comfortable space for the patient Space capacity as well as the color scheme of each room, materials, air conditioning and lighting fixtures shall be comprehensively examined.</li> <li>■ Consideration about gender-sensitivity.</li> </ul>
	Legibility of space
	<p>Legibility of space shall be secured for the outpatient, particularly for those coming for the first time. Registering, examination/testing/diagnosis, payment, and medication receiving should be easily carried out, including moving from one place to the next.</p> <ul style="list-style-type: none"> <li>■ Hierarchy of spatial structure The spatial structure of the facility is to be arranged in such a way as to allow for the user to easily comprehend it. For instance the main hallway shall have an open ceiling space to achieve visual clearance.</li> <li>■ Clear and simple flow line</li> <li>■ Useful signage plan Improvements not only in space atmosphere but also in legibility shall be achieved through allotting a base color for each zone, utilizing a unique architectural design to guide and orient the outpatient.</li> </ul>
	Ease of Maintenance
	Daily operation and management are prerequisites for ensuring various functions of the facility.

	<p>The ease of maintenance shall be examined.</p> <ul style="list-style-type: none"> <li>■ Measures to maintain daily hygiene and cleanliness <ul style="list-style-type: none"> <li>- The storage area and circulation of clean/non-clean goods should be clarified.</li> <li>- Antibacterial materials shall be utilized for the finishes.</li> </ul> </li> <li>■ Securing enough space <ul style="list-style-type: none"> <li>- The space needed for inspection and maintenance for the machine room and the shafts shall be secured.</li> <li>- Maintenance work should be able to be carried out from communal spaces, such as corridors.</li> <li>- Routes for carrying in/out large-sized equipment for updating shall be studied and verified.</li> </ul> </li> <li>■ Securing durability <ul style="list-style-type: none"> <li>- The finishing materials shall be selected in consideration of securing durability.</li> </ul> </li> </ul>
Flexibility	
	<p>In the future, hospitals are expected to improve the qualities of services, diagnoses, treatments, and to increase operational efficiencies and management precisions. It is also anticipated that their roles will not only be diagnoses and treatments but will also include information dissemination for medicine and medical care. As a result, this facility is to have flexibility to adapt itself to changes concomitant with technological innovations in healthcare, one example of which being the plans for future expansion.</p> <ul style="list-style-type: none"> <li>■ The plans shall conform to the characteristics of each item of equipment, including the machinery for imaging diagnostic.</li> <li>■ Space for utilities is to contain some contingency extra space. In addition, the size of openings such as doors, should take into account additional work space which might be needed when the equipment is renewed.</li> <li>■ In view of responding to possible changes in the future, air conditioners are to be individualized, as opposed to centralized, as much as possible.</li> <li>■ The facility's capability for updating is to be examined, in order to secure flexibility to respond to possible changes and equipment replacements, etc. as enumerated below: <ul style="list-style-type: none"> <li>- Outpatient: newly establishing a new specialty outpatient clinic</li> <li>- Laboratory: introducing new tests</li> <li>- Wards: establishing new bio-clean rooms as new medical treatments are adapted</li> <li>- Facility designs in anticipation of future introductions of multimedia; for instance for future introduction of a computerized medical record system, which would require computers, additional ducting, etc.</li> </ul> </li> </ul>

#### (4) Specifications of rooms for imaging diagnostic equipment

As a result of study, it is found that there are mainly two types of medical facilities and they have different specifications of rooms for imaging diagnostic equipment each other: one is MCH and the other is private hospital. Each general specification is summarized as below.

Table 7-23: General Specifications of Rooms for Imaging Diagnostic Equipment

		MCH	Private Hospital
MRI	Floor	Mortar paint	Dust free aseptic floor
	Wall	Porcelain tile	Dense concrete
	Ceiling	Plaster, paint and false ceiling	Plaster, paint and false ceiling
	Doors	Copper shielded	Copper shielded
CT-Scanner	Floor	Mortar paint	Dust free aseptic floor
	Wall	Porcelain tile	250mm brick wall
	Ceiling	Plaster, paint and false ceiling	Plaster, paint and false ceiling
	Doors	Normal (woods)	Normal (woods)
X-ray Machine	Floor	Mortar paint	Homogeneous tile
	Wall	Mortar paint or porcelain tile	250mm brick
	Ceiling	Mortar paint or plaster, paint ad false ceiling	Plaster, paint and false ceiling
	Doors	Normal (woods)	Lead shielded
Mammography	Floor	Mortar paint	Homogeneous tile
	Wall	Mortar paint or porcelain tile	250mm brick wall
	Ceiling	Mortar paint or plaster, paint ad false ceiling	Plaster, paint and false ceiling
	Doors	Normal (woods)	Lead shielded or normal
Endoscopy	Floor	Mortar paint	Homogeneous tile
	Wall	Mortar paint or porcelain tile	Homogeneous tile
	Ceiling	Mortar paint or plaster, paint ad false ceiling	Plaster, paint and false ceiling
	Doors	Normal (woods)	Normal
Angiography	Floor	Mortar paint	Homogeneous tile
	Wall	Mortar paint or porcelain tile	Homogeneous tile
	Ceiling	Mortar paint or plaster, paint ad false ceiling	Plaster, paint and false ceiling
	Doors	Normal (woods)	Normal

Source: Prepared by the Survey Team

In general, though the room for the imaging diagnostic equipment has to be inspected by Bangladesh Atomic Energy Commission and given a permission by him, rooms belong to the public hospitals are exempted from the Commission's control. Thus, it is difficult to secure the safety environment for patients, health workers and any other concerned.

Under the circumstances, in order to offer the safety and appropriate environment for medical equipment and all concerned, suitable specifications, even if they are not available in Bangladesh, are planned to be adopted in this design; e.g. barium panels as radiological protection and electromagnetic shield for MRI.

Outline of the construction work is shown in the Annex 17.

#### (5) Floor plan

The main sub-projects of the Imaging Diagnostic Center are imaging diagnostic area such as

rooms to install MRI, CT scanner and X-ray machine, conference and seminar rooms and administration area such as a reception under the new management system and staff's rooms. Schematic design for imaging diagnostic center (prototype) is shown in Annex 18.

(6) Planning and design objectives of the imaging diagnostic center building

The proposed integrated imaging diagnostic system requires the appropriate environment for operation as well as specialized maintenance for sophisticated equipment.

1) Safe and environment-friendly setup for radiology equipment

Radiology equipment requires complete radiation shield, which should be made of environment friendly materials. Unfortunately, the quality and quantity of MCH's radiation shields are not adequate. Further, all hospitals use radiation shields made of lead, which has a negative impact on the environment. The proposed project has to set a standard in safety and ecology in the area of radiology in Bangladesh.

2) Clean, easy, and cost-efficient maintenance for electronic equipment

Imaging diagnostic equipment and server computers generate heat, and thus require a clean environment with low humidity and proper temperature to ensure their good condition and long lifespan. The atmosphere of all cities with a medical college is dusty, humid, and hot, which could damage electronic equipment. Therefore, the Imaging Diagnostic Center Building should be kept in a clean, dry, and climate-controlled atmosphere at the most economical means possible. The building should provide heat resistance and absolute air sealing to reduce electricity costs for 10 years of operation.

3) Integrated security operation system of all linked equipment

Each type of imaging diagnostic equipment is connected to the network through PACS/RIS, through which integrated imaging diagnostic data and many other functions may be accessed for better diagnostic services and proper management. The security system of the imaging diagnostic center building will be isolated to eliminate the risk of a security breach to the building's hardware and software. The building can be installed with an electric back up system as security against electrical problems; further, a network security system will protect the building from hacking.

4) Centralization concept, including building efficiency for imaging diagnostic services

All items of imaging diagnostic equipment are packaged in the smallest possible size to facilitate easy operation and maintenance. Even in the case of imaging diagnostic system trouble, assigned personnel can easily take action because all components are in one building. The system will be located in the MCH for easy operation and maintenance. For example, equipment or system downtime can be minimized. The centralization concept

can contribute to the efficiency of the imaging diagnostic services.

#### 5) Impact of the Imaging Diagnostic Center Building as model for future projects

The success of the system in contributing to improving medical services for the people could make the building scheme an ideal prototype for the future construction and management of hospitals in Bangladesh.

### 7.3.2 Medical Equipment

#### (1) Current situation of imaging diagnosis in MCHs

As a general rule, public health care facilities in Bangladesh provide health care services with very low charge. Therefore, since public health care facilities do not deny treatment of the patients in poverty, many of the people tend to go to medical facilities that can provide higher quality health care. In order to effectively utilize health care resources in a proper manner, it is important to have a referral system function effectively. However, patients and their families tend to want to go to tertiary health care facilities that have a better level of personnel, equipment and medicine, rather than going to primary health care facilities or secondary health care facilities, which has resulted in the current situation of a concentration of patients at MCHs.

The following graph shows the trend of numbers of patients examined by main imaging diagnostic apparatus such as CT, MRI, General X-ray, and Ultrasound for the last five years in Dhaka MCH and Sylhet MCH.

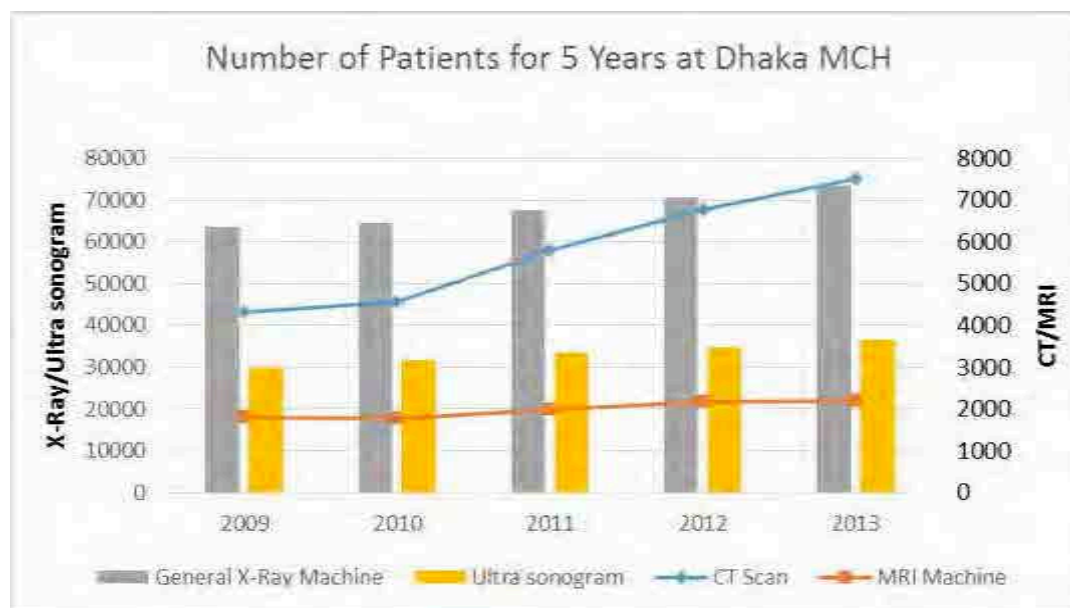


Figure 7-15: Number of Patients for 5 Years at Dhaka MCH

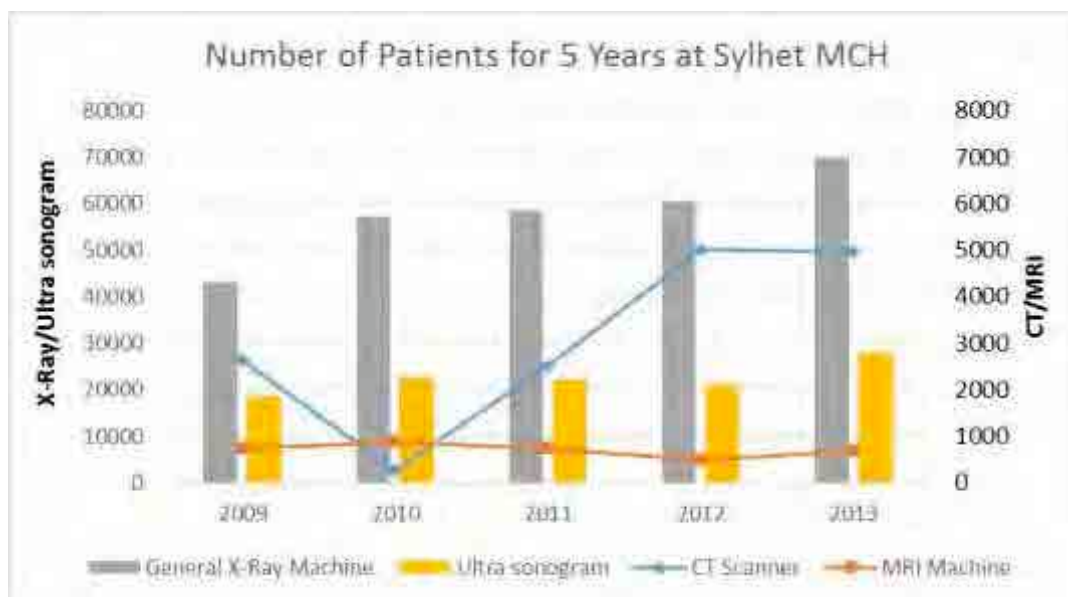


Figure 7-16: Number of Patients for 5 Years at Sylhet MCH

The number of patients has increased almost year after year not only in Dhaka but also in local cities at MCHs. It can be considered that securing diagnostic equipment as well as the increase of radiologists and medical technologists is necessary to cope with the expected increase of patients.

Because all of the MCHs are overwhelmed with many patients every day, all the imaging diagnostic equipment are overused when comparing with the normal operation capacity. And indeed there are cases that the hospitals cannot provide adequate treatment because there are so many patients. In particular, it is one of main cause of radiology and imaging diagnostic equipment breakdown that exceed the capacity of the equipment in order to examine and diagnose as many patients as possible. Even after breakdown, repair cost and spare parts are quite expensive, so that hospitals and MOHFW cannot to react immediately for sudden expense which is beyond their annual budgets. Furthermore, base price of the equipment is extremely expensive to buy and replace. As a result, currently many hospitals continue to use the aged equipment. Those difficulties of smooth repairs or replacement of the equipment have not lived up to people's expectation which meet the actual demands of imaging diagnosis. The numbers of examinations taken by imaging diagnostic equipment at major eight MCHs is shown in Table 7-24. Table 7-25 shows the latest inventory of main imaging diagnostic equipment at eight MCHs. Table 7-26 shows the latest health professional allocation in each MCH.

Table 7-24: Number of Examinations with Imaging Diagnostic Equipment at Each MCH in 2013

	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	BSMMU	Total
CT	7,500	1,605	4,087	2,078*	4,964	5,592	2,515	14,200	42,541
MRI	2,616	720	-	1,526	692	1,890	140	4,300	11,884
GX-ray	73,500	48,921	5,754	41,370	69,770	36,198	37,000	193,440	505,953
Mammography	41	-	10	-	420	-	-	1,000	1,471
Ultrasound	36,500	6,887	2,256	22,345	28,046	10,962	4,960	82,000	193,956
Angiography	604	697	-	792	488	300	0	2,269	5,150
Gastroscope	3,433	1,056	497	1,838	3,152	1,648	1,200	1,823	14,647
Colonoscope	259	192	-	15	396	304	200	510	1,876
Duodenoscope	1,000	-	-	-	63	1	-	115	1,179
Total	125,453	60,078	12,604	69,964	107,991	56,895	46,015	299,657	778,657

\*Number of CT at Rajshahi in 2011, because CT is broken from 2012

Table 7-25: Inventory of Main Imaging Diagnostic Equipment at Each MCH

	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	BSMMU
Beds Number	2,400	1,010	500	530	900	1,000	500	1,500
CT scan	N1B1	1	1	B1	1	2B1	2N1	N1
MRI	1	1	0	1	1	2N1	B1	N1
Fluoroscopy	1	2	0	B1	1	1	B1	2
General X-ray	2N1	N1	2N1	2B1	3N1	2	1	N2
Digital X-ray	N1	N2	0	0	0	N2	0	0
Mobile X-ray	N1	2	0	1	2	3	1	N1
Mammography	N1	0	N1	0	1	B1	0	N1
Ultra sound	N5	N3	4N1	4N3	4N3	3N1	B3	N6
Angiography	1	1	0	1	1	1	N1	4B1
Gastroscope	2	1	1	3B1	1	N2	1	3B2
Colonoscope	1	1	0	2B1	1	N2	1	3B2

N: New Equipment produced after 2010, B: Broken Equipment at 2013

(2B1: There are 2 equipment but 1 is broken, 3N1: There are 3 equipment but one is NEW)

Table 7-26: Number of Doctors and Medical Technologist (Radiographer) in Radiology, Cardiology and Gastroenterology at Each MCH

Profession	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	BSMMU
Radiologist	25 (9)	8 (3)	5 (1)	10 (1)	7 (0)	8 (4)	7 (3)	N/A
Medical Technologist	22 (0)	10 (0)	4 (0)	10 (0)	9 (0)	9 (0)	8 (1)	N/A
Cardiologist								
(1)for diagnosis	6 (0)	3 (0)	1(0)	4 (0)	3 (0)	2 (0)	2 (0)	N/A
(2)for intervention	3(0)	1 (0)	0	1 (0)	1 (0)	1 (0)	1 (0)	N/A
Gastroenterologist	13 (0)	6 (0)	1 (0)	2 (0)	4 (0)	2 (0)	1 (0)	N/A

Source: Prepared by the Survey Team

\*The figure between brackets indicates the number of female staff

As the amount of equipment responding to the number of patients at a MCH, CT scanner, MRI machine, and other imaging diagnostic equipment are required. There are two active CT scanners at Barisal MCH while only one is working at other MCHs. Rajshahi MCH has one



CT scanner but it is out of order. As for MRI, there is only one MRI which is working at many MCHs except Khulna and Barisal MCHs which do not have any. Khulna, Rajshahi and Barisal MCHs have either no fluoroscopy machine or a broken one, and there is just a broken one at other MCHs. This situation indicates that many patients are in need of examination a day and they can make a long line for their turn of examination.

In case equipment breaks down, many patients are requested to go to private facilities nearby, pay expensive examination charges, and bring the exam results to the MCH for further diagnosis and treatment. In some cases, this results in it not being possible for patients to be examined and not receiving any treatment.

Even though the Survey Team did a survey on the number of patients who could not undergo any examination, accurate data has not been acquired. It is observed that sixty percent of patients cannot undergo any examination of endoscopy at four MCHs. (Refer to the following table: Percentage of Patients cannot undergo gastroscopy and colonoscopy examination =  $\text{Deprived Patients} / \text{Required Patients} \times 100$ ).

Table 7-27: Number of Patients Requiring and Missing Tests per Month

		Chittagong	Rajshahi	Rangpur	BSMMU	Total
Gastroscopy	Patients required tests	230	760	265	253	1508
	Patients missed tests	160	530	140	130	960
	Percentage (%)	70	70	53	60	63
Colonoscopy	Patients required tests	60	-	80	43	640
	Patients missed tests	40	-	50	25	390
	Percentage (%)	67	-	63	60	61

Source: Prepared by the Survey Team through interview with doctors in department of gastroenterology in MCHs and BSMMU using the questionnaire

To improve the situation above, quality development of diagnosis as well as the enhancement of both diagnosis function and efficiency would be a key element to realize better medical treatment for more people.

Recently, the disease structure in Bangladesh has been changing as the statistical data shows the increase of non-communicable diseases. There have been gradually more and more patients with obesity, cardiovascular disease and diabetes. Originally, preventive health care is the biggest solution for treating these diseases but capability building of diagnosis ability in image diagnosis is essential in order to diagnose patients adequately, leading to the problem solving on the whole. Traffic accident occupies the upper level in the cause of death in Bangladesh. In particular, the treatment of head trauma is impossible without a specialized

image diagnosis.

## (2) Suggestion of the sub-projects beyond HPNSDP 2011-2016

As sub-projects beyond HPNSDP 2011-2016 in the Yen Loan Project Phase 2, in conjunction with the construction of imaging diagnostic center, the Survey Team proposes the introduction of image diagnosis equipment into seven MCHs in seven divisions of Bangladesh, which play an important role as a top referral hospital in each division. The overall objectives of introducing equipment are to improve the function of image diagnosis through the quantity and quality assurance, and to contribute to the development of future medical education in Bangladesh.

This suggestion aims not only for the quantity and quality assurance by introducing equipment for image diagnosis, but also for contributing to the improvement of hospital management through the optimization of examination order (which both mitigates the complicated order of many patients' examination and reduces the mistake of confusing examination fee) and the enhancement of operation function such as minimizing patients' waiting time. The following matters are expected.

### 1) Ensuring of diagnostic capacity

In order to meet the needs of patients in an image diagnosis at each MCH, the Survey Team has designed the following table which represents tentative numbers of required imaging diagnostic equipment at each MCH; one CT, one MRI, two general X-rays, one mammography, the demand number of ultrasounds, one Angiography (depending on size/scale of hospitals), four gastroscopes, and two colonoscopes. (Among existing equipment, equipment produced within three years is not targeted for updating.) The following table shows the number of imaging diagnostic equipment which is considered as the minimum required number in the introduction of PACS. At least one imaging diagnostic equipment is installed into each medical college. It is desirable also for angiography, but Sylhet and Rangpur could not list it up because of the budget constraint. PACS+RIS (300K) in Dhaka MCH requires a computer server with a big capacity to manage 300,000 patients per year.

Table 7-28: Numbers of Required Imaging Diagnostic Equipment at Each MCH

	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	Total
CT (128 slice)	R1	R1	R1	R1	R1	R1	R1	7
MRI (1.5T)	R1	R1	N1	R1	R1	0	R1	6
Digital X-ray	R1	A1	R1A1	R2	R2	0	R1A1	10
Mammography	0	N1	0	N1	R1	R1	N1	5
Ultra sound (4D)	A3	A2	R2	R1A1	R1A1	R2	R3	16
Ultra sound (2D)	A4	A4	R1A3	A3	A3	A4	A4	26

Angiography	R1	R1	N1	R1	0	0	0	4
Gastroscope	R2A2	R1A1	R1A1	R2	R1A1	A2	R1A1	16
Colonoscope	R1A1	R1A1	A2	R2	R1A1	A2	R1A1	14
PACS+RIS(300K)	N1	0	0	0	0	0	0	1
PACS+RIS(150K)	0	N1	N1	N1	N1	N1	N1	6

Remarks: A=Additional equipment for clinical demand chapter 6 d, R=Replacement for degraded equipment, N=New functional supply

If the imaging diagnostic equipment is installed according to the above plan, inventory will be change as following table in the 7 MCHs. All of examination of imaging diagnosis will be available except fluoroscopy test in Khulna, Rajshahi and Barisal. And most of the imaging diagnostic equipment will be renew to expect keeping good condition while the persons in charge of MRI and angiography should be allocated in Khulna in which those two equipment are quite new. However total number of examination in 7 MCHs will be increased by those new equipment and efficient operation with PACS and RIS. Especially number of examination on ultrasound and endoscopy will be increased so much to compare the previous condition.

Table 7-29: Expected Inventory of Imaging Diagnostic Equipment in 7 MCHs

	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal
CT scan	2	1	1	1	1	1	2
MRI	1	1	1	1	1	1	1
Fluoroscopy	1	2	0	0	1	1	0
General X-ray	2	1	2	1	1	0	0
Digital X-ray	2	3	2	2	2	2	2
Mobile X-ray	1	2	0	1	2	3	1
Mammography	1	1	1	2	1	1	1
Ultra sound	12	9	7	8	7	7	7
Angiography	1	1	1	1	1	1	1
Gastroscope	4	2	2	3	2	4	2
Colonoscope	2	2	2	2	2	4	2
PACS+RIS(300K)	1	0	0	0	0	0	0
PACS+RIS(150K)	0	1	1	1	1	1	1

2) Entire shift to digital image from Computer Radiography (CR) to Digital Radiography (DR)  
 -Quality development of image diagnosis capability and optimization through the minimization of waste film and reading procedure-

Since CR which -digitization of radiology images from reusable film to a reading device- has already become common at MCHs in Bangladesh, film developing has been getting unnecessary. DR, which directly reads digital images without involving any film by flat panel from CR, has started to be introduced at three MCHs. It is obvious that the digitization of the film will be widespread through the introduction of DR into the whole Bangladesh. In addition,

introducing DR equipment would enable more imaging diagnostic/photographing of patients by enhancing the capability of image diagnosis and shortening the time and operation procedure.

### 3) From the disposal image to archiving image

#### -Introduction of PACS (Picture Archiving and Communication Systems)-

- Integrated management of diagnostic image and information sharing among hospitals  
At MCHs, developed diagnostic images and films have been given to patients but they have not been stored and kept. Without an adequate safekeeping of those films, imaging photography must be done every time in the same diagnosis. In addition, special cases have not been fully utilized for other patients. The introduction of PACS realizes the unified management of diagnostic image. Also, it makes it possible to detect, modify, diagnose, and store images according to different purposes of each treatment. In addition, standardization of patients' ID enables medical staff at MCHs to access to patients' data without mistake. -It is possible to share images among PACS through the connection of Internet and leased lines among MCHs- And the standardized of patients' ID should be decided and authorized under medical radiology association in Bangladesh and MOHFW.
- Enhancement of diagnostic ability  
Image editing function makes it possible to detect lesion, and contribute to the enhancement of diagnostic ability through the classification, evaluation and screening of image as an auxiliary tool for medical treatment.
- Document for medical education  
It becomes possible to display and review images on a big screen, leading to the utilization as a document for medical education.
- Access to information by medical staff in charge  
Efficiency of medical treatment would be improved since PACS enables doctors and medical staff in charge to have direct access to patients' diagnostic image.
- Utilization for the future remote medical treatment  
If CR in radiology department and Internet connection are realized at DHs, it would become possible to read images of DHs at MCHs, leading to the achievement of mutual assistance for diagnosis.

### 4) From analog to digitized management of patients' information and examination request

#### -Introduction of RIS: Radiology Information System-

- Automation of the diagnosis order  
The system enables each treatment department to order and see diagnostic images at their section, which leads to enhancing the efficiency of operation and human power-saving.

- Enhancement of patient management capability  
RIS enables a digitization of patient information which has been made by hand so the risk of confusing images would be drastically mitigated. Also, types and number of patients' photographed images become clearer so the confusion of examination fee would be decreased.
- Contribution to the administrative improvement  
Integrated report concerning image diagnosis is automatically made even though so far statistical processing has been done by hand.
- Reducing consumable for diagnostics  
Previously CR system required print of film to read and diagnostic for each patient. PACS can be minimized the printing films and RIS can record and manage the consumption of consumables.
- Establishment of maintenance system  
RIS enables unified management and reporting of information in the operation and maintenance of imaging diagnostic equipment, and functions as a major system of equipment maintenance structure. Thanks to this management tool, special management structure and software do not need to be established.
- Unified information management of patients and situation at radiology department among seven MCHs  
If RIS is utilized at 7 MCHs, easy access to information as well as information sharing and management in terms of patients, diagnostic situation and equipment becomes possible. It would be reported to the MOHFW as a role model of unified information management system.

##### 5) Rendering of digital image (realization of operating simulation in three dimensions)

The connection of 3D workstation of digital image to PACS server enables the 3D image extract from the data of CT, MRI, and Ultrasound. Extracting the data of blood vessel and nerve also makes the data a simulation data before the operation. If this data is connected to the 3D printer, a substance model is created, and actual simulation of operation would be possible.

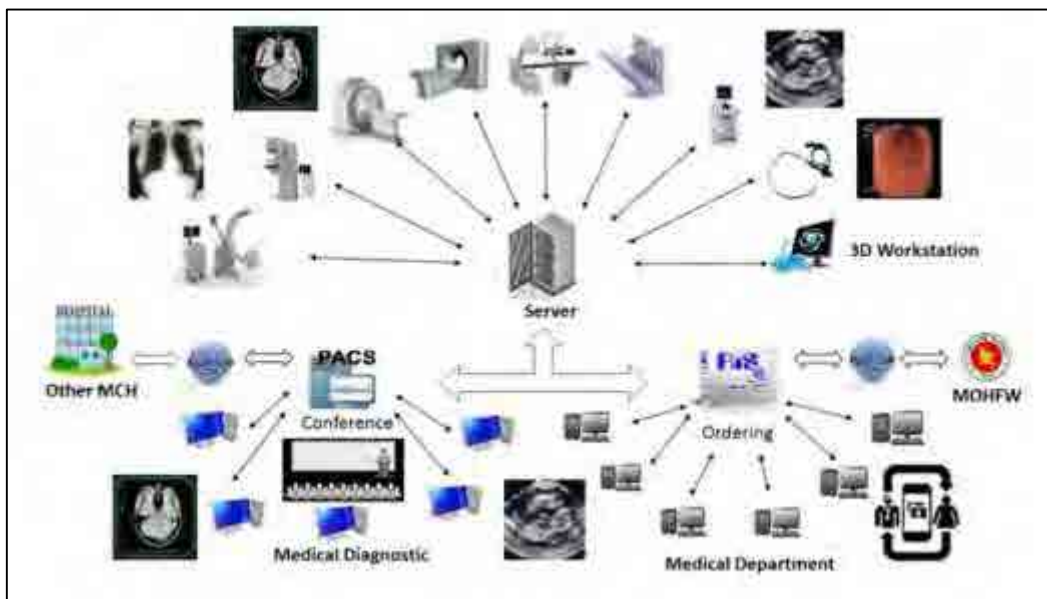


Figure 7-17: Digital Imaging Diagnostic & Ordering System

#### 6) Common system of 7 MCHs

There are some significant advantages of scale as 7 MCHs have and utilize common imaging diagnostic equipment and software in a similar environment under the common construction.

- Ten year maintenance supports of imaging diagnostic equipment  
Equipment guarantee period of MOHFW is 5 years but considering the durability of the imaging diagnostic equipment, it is not long enough to keep the equipment in a good condition. If the project can install the same model of equipment into 7 MCHs, equipment agents would be able to make it possible for long-term maintenance supports with minimum stock of spare parts. The cost of repair for the equipment, in particular, is a big challenge of MOHFW so this maintenance supports would contribute to the reduction of its expenditure.
- Communization of software operation  
If introducing common software system operation is successful at 7 MCHs, it can be applied into other hospitals. It means that operation is done through the network even at other hospitals. In this way, those involved in the equipment including medical students can operate the software without any problem.
- Communization of equipment management system  
It is basically essential to operate and manage the equipment, the communization of equipment management system makes it possible to make a maintenance report, compare and compile the data/situation of 7 MCHs.

### 7.3.3 Training

#### (1) Basic policy in designing training plan

Introduction of new medical equipment and implementation of technical training for users are inherently connected. The acquaintance with how to operate and maintain the new equipment, so to speak, is a precondition for the installation of new equipment. Although the equipment which will be introduced to each hospital is considered to make the health care level more cost-effective, without training for those who use it, introduced equipment will not be fully utilized regardless of its amazing function.

It has been found that in Bangladesh, the agent's engineer does not necessarily come to the hospital promptly for trouble-shooting, much less for the inspection and maintenance even though medical equipment is a key element leading to better diagnosis and treatment. Disadvantage is that most of MCHs except Dhaka MCH do not have enough number of radiologists and medical technologists for daily equipment operation so residents and interns are counted as additional and supportive operators. Since the staff insufficiency is considered to be severe at the period of the equipment installation, the Survey Team recommends additional allocation of human resources to targeted MCH and MOHFW in advance.

In addition to the quantitative enhancement, medical staff's knowledge/skill development regarding equipment could be one of the most significant solutions for the above circumstance in Bangladesh. For the installation of new equipment, training would mainly include the following items; operation for users (for doctors and medical technologists), diagnosis (for doctors), maintenance (for medical technologists and other users), data management (for users) and so on. It is proposed that training should be divided into three stages: (1) immediately after, (2) 3–6 months after (as the first follow-up), and (3) 6 months–1 year after (as the second follow-up) the installation of equipment. The training should be at an advanced level intended for all doctors and technologists at seven MCHs to review and brush up their knowledge and to acquire new ideas and skills. Even though the duration of training on the diagnosis, operation, and maintenance of equipment is suggested (see the plan on the following page), this could be changed because some equipment may already be familiar to them.

To provide the service for the required functions, including service with the newly procured equipment, the following medical topics, which are particularly notable from the survey results, should be covered:

## Topic 1: Injury and diseases

<b>1-1. Traffic accident-related injuries</b>
The results of the survey indicate that the biggest problem in Bangladesh is the “traffic accident”. For the treatment of injury, quick diagnosis, quick treatment, and appropriate infection care, a CT scanner is a basic item for diagnosis of injury, especially to find head and brain damage, and other internal organ damage. After examination and diagnosis, patients are sent to treatment process in surgical operating room, and transferred to ICU if necessary. All the services in this consistent flow should be confirmed in the training course
<b>1-2. Maternal, Neonatal and Child Health (MNCH)</b>
As statistical data shows, MNCH is one of the biggest challenges and a key issue not only in Bangladesh but in developing countries as a whole. For safe delivery and saving the infant from various physical stressors, several important items of equipment such as ultrasound diagnostic equipment, requiring specific medical knowledge and techniques of operation, are necessary to be highlighted. In Bangladesh, radiologists operate ultrasound and diagnose the patient so they must attend the training course. If necessary, obstetricians can be involved.
<b>1-3. Cardiac disease: heart, brain, abdomen and peripheral blood vessels</b>
Cardiac disease such as myocardial infarction is also one of the main causes of death in each hospital. However, compared with the above-mentioned problems, treatments of cardiovascular diseases such as dilatation of stenosis of coronary artery and placement of an endovascular stent, require more advanced technologies. A more advanced interventional radiological training plan will be required for the CT scanner and angiographic new equipment because the diseases covered by these machines are vascular diseases of the brain, heart diseases, abdominal neoplasm, peripheral vascular diseases and considerably complicated operative interventions are possible. These training courses need to be done with proper equipment, facilities and experienced teaching staff at the time of equipment installation.
<b>1-4. Cancer</b>
Cancer is not the main cause of mortality in Bangladesh but the present statistical health data represents that NCDs have increased. Introducing radiology equipment would make it possible to detect more suspected patients with various types of cancer. Based on this consideration, it can be inferred that cancer will become one of the major diseases in the near future. Some simple surgical operations for the cancer of digestive organs have already started even in DHs. From this consideration, it is obvious that diagnostic and therapeutic endoscopy especially for digestive cancer will be necessary even though maintenance fee of equipment is included as a compensation, so the training will be also needed. In addition, in Bangladesh, breast cancer and cervical cancer are common diseases followed by lung cancer in the causes of female death. Mammography as well as ultrasound is important for early detection of breast cancer but has not been fully utilized at visited MCHs mostly due to the lack of female technologists. So along with the introduction of mammography, both training and increase of female technologists will be necessary. At the radiology department, training on digital X-ray and MRI will be needed much more.

## Topic 2: Use and maintenance of medical equipment

<b>2-1. Picture Archiving and Communication System (PACS)</b>
PACS aims to store, manage, and inspect the imaging diagnostic data sent by photographing devices such as CR, CT and MRI. Also, imaging diagnostic data of non-radiological equipment such as endoscopy and ultrasound devices can be stored as a unitary management system through DICOM (Digital Imaging and Communication in Medicine), which is a standard for handling, storing, printing, and transmitting information in imaging diagnosis, and includes a file format definition and a network communications protocol. It is obvious that adequate management system contributes to quality diagnosis, treatment and education so the necessity of training on PACS is high. Training on PACS will target radiologists, medical technologists. Administrators who have a responsibility of registration of patients can be involved if necessary.



<b>2-2. Radiology Information System (RIS)</b>
The Survey Team considers that more efficient and effective patient management system would be needed in the introduction of new equipment. In particular, introduction of digital patient record system, RIS is desirable in a circumstance of Bangladesh. Like the training on PACS, training on RIS will target radiologists, medical technologists and those who have a responsibility of registration procedure of patients.
<b>2-3. Maintenance of equipment</b>
Maintenance of equipment is one of the biggest challenges to be solved in Bangladesh. In fact, the Survey Team observed many instances of damaged equipment which had been left without any repair at surveyed MCHs. Regular inspection and daily maintenance are key factors for the sustainable use of equipment. According to the survey, all visited hospitals requested the Survey Team to include medical equipment maintenance in training course plan. Some guidance for maintenance should be included in the equipment price itself. However, sometimes it takes a long time for a local hospital to receive a visit from a support person even in the case of small trouble.

## (2) Detailed contents of training courses

On the basis of training policy, contents of the training are shown along with the following aspects. Detailed training plan is shown in Table 7-30.

### 1) Basic framework

Training is roughly divided into two categories: domestic training and overseas training. Training for ultrasound, mammography, CT, MRI, digital radiography, gastroscopy, colonoscopy, and angiography would be implemented only in Bangladesh, whereas it is suggested that training for PACS/RIS be organized in Japan and Bangladesh because it is the first introduction of PACS/RIS in Bangladesh, and it may require some time for familiarization owing to its complex mechanism. There is no training site for learning the actual operation and management of PACS/RIS in Bangladesh at present. As for domestic training, the Survey Team has considered that most local training courses should be held in each division, thus facilitators would travel to and instruct in each respective division.

### 2) Contents

As stated in (1), training on operation, diagnosis, maintenance, and data management is considered as necessary for the introduction of the following equipment; ultrasound, mammography, CT, MRI, Digital X-ray, angiography, gastroscope, colonoscope, endoscopy, PACS and RIS. As all training courses are basically clinical and practical, there should be no more than 10 persons per group, and the basic informational, operational, and theoretical aspects of each piece of equipment shall be taught in each training session, so that participants can review and refresh their knowledge.

### 3) Target

Target persons are mainly radiologists and medical technologists (radiographer), while

cardiologists and gastroenterologists would be targeted for some training. The total number of participants will be determined based on the total number of target persons at all MCHs. The concept is that each individual should learn about each piece of equipment. In addition, after training, participants are expected to reinforce their knowledge through discussions with colleagues regarding the information covered in the training. It is possible that the total number of participants or the numbers in a group for each training session will be increased or decreased as necessary. It is also possible that trainings on the utilization of PACS and RIS might be intended for not only radiologists and medical technologists but also for administrative assistants/receptionists working on the patient's record/management at some MCHs such as Dhaka MCH.

#### 4) Duration

As previously described, training sessions shall occur over three stages: 1) immediately after, 2) 3–6 months after (first follow-up), and 3) 6 months–1 year after (as a second follow-up) the installation of the equipment. The duration of each training course will be determined at each process/stage of training, including the operation, diagnosis, maintenance, and data management of each piece of equipment. The desirable duration for each training session is estimated based on the survey results (condition and challenges of target sites/persons, and needs of targeted medical personnel), data from training held by other organizations, and the perspectives of doctors and engineers in Japan. This duration could be flexibly changed at the implementation stage.

#### 5) Place

Most of the training will be implemented in Bangladesh; however, as stated in 1), some advanced technical training, such as for the PACS/RIS, would be held in Japan.

#### 6) Instructor

It is suggested that there shall be at least three local facilitators for each local training session: one engineer from the agents, one or two experienced radiologists, and one or two medical technologists. However, for angiography and PACS/RIS training, two Japanese experts would be invited, because both angiography and PACS/RIS are not commonly operated at the targeted MCHs, especially outside of Dhaka.

Table 7-30: Training Program

No	Item of Equipment	Overall Objective	Expected Outcome <i>*At the end of all trainings, trainees are able to -</i>	Target		Batch		Duration *2				Place	Potential Instructor		
				Target personnel	Total No. of target (Local) *1	No. of persons in a group (Maximum)	No. of batches (Maximum)	1st Post-installation (Days)	2nd: Follow-up (1) (Days)	3rd: Follow-up (2) (Days)	Grand Total				
1	Ultrasound	•To develop the skill and knowledge of using ultrasound for PACS & RIS communication •To improve diagnostic capabilities of ultrasound	•acquire diagnostic capabilities in ultrasound especially for neck, abdomen, breast, and body surface •acquire the standardized diagnostic procedure for PACS & RIS	Radiologist	70 (25)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist (1)	Expert Radiologist (2)
2	Mammography	•To develop the skill and knowledge of using mammography for PACS & RIS communication •To advance the capability of differential diagnosis mammography	•operate mammography and differentiate diagnosis of breast cancer •correctly state differential diagnosis and observation in a report •acquire the standardized diagnostic procedure for PACS & RIS	Radiologist	70 (25)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist (1)	Expert Radiologist (2)
3	Mammography	•To develop the skill and knowledge of using mmamography for PACS & RIS communication	•explain the feature of equipment and operate it safely •perform maintenance and inspection of computers and peripheral devices such as luminance control of PC monitor •understand the implementation method of equipment such as safety control, daily inspection, and regular preventive inspection •acquire the standardized diagnostic procedure for PACS & RIS	Technologist (Radiographer)	72 (22)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist	Expert Technologist
4	CT	•To develop the skill and knowledge of using CT for PACS & RIS communication •To improve diagnostic capabilities of CT •To deepen the understanding of radiation safety	•understand the application of contrast radiography and acquire the technique of equipment •correctly state observation/findings based on the interpretation of images in a report •understand the safety handling and protection of radiation •acquire the standardized diagnostic procedure for PACS & RIS	Radiologist	70 (25)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist (1)	Expert Radiologist (2)
5	CT	•To develop the skill and knowledge of using CT for PACS & RIS communication •To deepen the understanding of radiation safety	•explain the feature of equipment and operate it safely •understand the safety handling and protection of radiation •differentiate normal and abnormal images in each examination •read and interpret radiogram/image of frequent diseases •perform maintenance and inspection of computers and peripheral devices such as luminance control of PC monitor •understand the implementation method of equipment such as safety control, daily inspection, and regular preventive inspection •acquire the standardized diagnostic procedure for PACS & RIS	Technologist (Radiographer)	72 (22)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist	Expert Technologist
6	MRI	•To develop the skill and knowledge of using MRI for PACS & RIS communication •To improve diagnostic capabilities of MRI	•understand the application of contrast radiography and acquire the technique of equipment •correctly state observation/findings based on the interpretation of images in a report •acquire the standardized diagnostic procedure for PACS & RIS	Radiologist	70 (25)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist (1)	Expert Radiologist (2)
7	MRI	•To develop the skill and knowledge of using MRI for PACS & RIS communication	•explain the feature of equipment and operate it safely •understand the safety handling and protection of radiation •differentiate normal and abnormal images in each examination •read and interpret radiogram/image of frequent diseases •perform maintenance and inspection of computers and peripheral devices such as luminance control of PC monitor •understand the implementation method of equipment such as safety control, daily inspection, and regular preventive inspection •acquire the standardized diagnostic procedure for PACS & RIS	Technologist (Radiographer)	72 (22)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist	Expert Technologist
8	Digital X-ray	•To develop the skill and knowledge of using Digital X-ray for PACS & RIS communication •To improve diagnostic capabilities of Digital X-ray •To deepen the understanding of radiation safety	•give a diagnosis of major diseases in a plain X-ray examination •understand the application of contrast radiography and acquire the technique of equipment •correctly state observation/findings based on the interpretation of images in a report •understand the safety handling and protection of radiation •acquire the standardized diagnostic procedure for PACS & RIS	Radiologist	70 (25)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist (1)	Expert Radiologist (2)
9	Digital X-ray	•To develop the skill and knowledge of using Digital X-ray for PACS & RIS communication •To deepen the understanding of radiation safety	•explain the feature of equipment and operate it safely •understand the safety handling and protection of radiation •differentiate normal and abnormal images in each examination •read and interpret radiogram/image of frequent diseases •perform maintenance and inspection of computers and peripheral devices such as luminance control of PC monitor •understand the implementation method of equipment such as safety control, daily inspection, and regular preventive inspection •acquire the standardized diagnostic procedure for PACS & RIS	Technologist (Radiographer)	72 (22)	10	9	15	10	10	35	Bangladesh	Agent's engineer	Expert Radiologist	Expert Technologist
10	Gastroscope	•To develop the skill and knowledge of using gastroscope for PACS & RIS communication •To improve diagnostic capabilities of gastroscope	•acquire the method of using and sterilizing gastroscope •understand the infection control of patients and users •acquire the standardized diagnostic procedure for PACS & RIS	MD (Gastroenterology)	29 (16)	10	8	15	10	10	35	Bangladesh	Agent's engineer	Expert MD in Gastroenterology	Expert Radiologist
11	Colonoscope	•To develop the skill and knowledge of using colonoscope for PACS & RIS communication •To improve diagnostic capabilities of colonoscope	•read and interpret radiogram/image of frequent diseases •advance treatment technique of biopsy and polypectomy •acquire the standardized diagnostic procedure for PACS & RIS	MD (Gastroenterology)	29 (16)	10	8	15	10	10	35	Bangladesh	Agent's engineer	Expert MD in Gastroenterology	Expert Radiologist
10	Angiography	•To develop the skill and knowledge of using angipgraphy for PACS & RIS communication •To improve diagnostic capabilities of angiography	•acquire the basic knowledge and skill of angiography (excluding brain and cardiovascular) including IVR •acquire the standardized diagnostic procedure for PACS & RIS	Cardiologist	21 (6)	10	7	20	15	10	45	Bangladesh	Japanese Expert (1)	Japanese Expert (2)	-
11	Angiography	•To develop the skill and knowledge of using angipgraphy for PACS & RIS communication	•explain the feature of equipment and operate it safely •perform maintenance and inspection of computers and peripheral devices such as luminance control of PC monitor •understand the implementation method of equipment such as safety control, daily inspection, and regular preventive inspection •acquire the standardized diagnostic procedure for PACS & RIS	Technologist (Radiographer)	72 (22)	10	9	20	15	10	45	Bangladesh	Japanese Expert (1)	Japanese Expert (2)	-
14	PACS	To advance the knowledge and operational skill in PACS	•understand and operate PACS	Radiologist	70 (25)	10	9	20	15	10	45	Bangladesh	Japanese Expert (1)	Japanese Expert (2)	-
15	PACS	To advance the knowledge and operational skill in PACS	•understand and operate PACS	Technologist (Radiographer)	72 (22)	10	9	20	15	10	45	Bangladesh	Japanese Expert (1)	Japanese Expert (2)	-
16	RIS	To advance the knowledge and operational skill in RIS	•understand and operate RIS	Radiologist	70 (25)	10	9	20	15	10	45	Bangladesh	Japanese Expert (1)	Japanese Expert (2)	-
17	RIS	To advance the knowledge and operational skill in RIS	•understand and operate RIS	Technologist (Radiographer)	72 (22)	10	9	20	15	10	45	Bangladesh	Japanese Expert (1)	Japanese Expert (2)	-
18	PACS & RIS	To advance the knowledge and operational skill in PACS & RIS	•understand and operate PACS & RIS	Radiologist & Technologist (Radiographer)	14	-	-	Trip to Japan (2 weeks)				Japan	Japanese Medical Staff (Mainly radiologists, technologists, and agent's engineers)		

\*1 Represents the total number of target personnel at all MCHs. According to the guideline of MOHFW for the implementation of in-service training, "local" means those who work inside Dhaka city (Dhaka MCH).

\*2 Duration of training is culculated as minimum days for understanding basic and advanced technical (operation/diagnosis/user maintenance/data management) aspects of equipment.

This period of training is considered and integrated according to the following viewpoints/resources.

1) Needs of some radiologists, technologists and MDs at Dhaka MCH, agency's engineer, and chief of NEMEW (training) from the questionnaire survey

2) Information of technical trainings organized by other donor agencies

3) Perspective/advice of doctors and equipment experts (from the survey team)



## **CHAPTER 8:**

# **Project Implementation, Operation and Maintenance Structure**



## CHAPTER 8: Project Implementation, Operation and Maintenance Structure

### 8.1 Project Implementation Structure

#### 8.1.1 Executing and Implementation Agencies

The executing and implementation agencies for the Yen Loan Project Phase 2 are shown below.

Executing Agency	Ministry of Health and Family Welfare (MOHFW)
Implementing Agency for the sub-projects within HPNSDP 2011-2016	OPs under the directorates shall be responsible with the coordination by the Joint Chief of the Planning Wing, MOHFW
Implementing Agency for the sub-projects beyond HPNSDP 2011-2016	Project Implementation Unit (PIU) established in DGHS with the coordination by the Joint Chief of the Planning Wing, MOHFW

#### (1) Organization of the Executing Agency

Executing Agency is MOHFW. The personnel hierarchy of MOHFW management at the secretariat is shown in Figure 8-1.

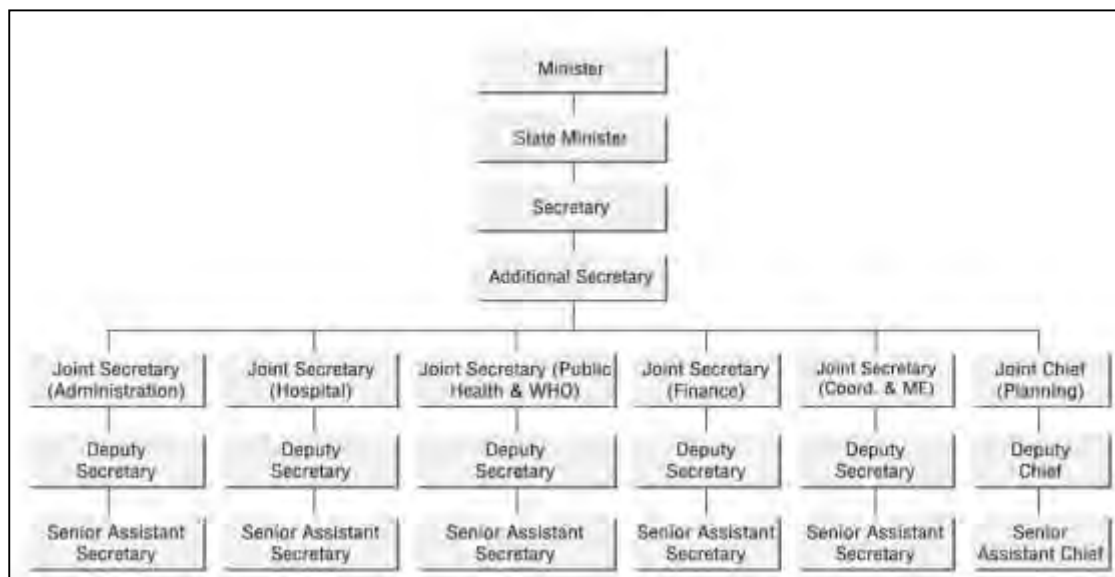


Figure 8-1: Hierarchy of Personnel in the MOHFW

Source: Health Bulletin 2013, MOHFW

The implementing authorities under MOHFW are shown in the figure below. There are 11 directorates under MOHFW as implementing authorities and some of the directorates are responsible for implementation of OPs as well. 4 OPs are managed by MOHFW directly; PFD OP by the Additional Secretary of Development & ME, HRM OP by the Additional Secretary of

Administration, SWPMM OP by the Planning Wing and IFM OP by the Joint Secretary of Finance. Table 8-1 shows the directorates under MOHFW and their responsible OPs.

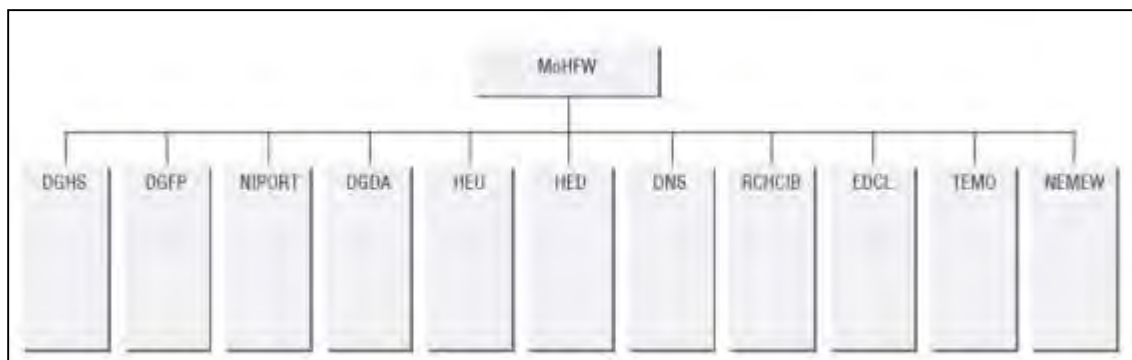


Figure 8-2: Implementing Authorities under MOHFW

Source: Health Bulletin 2013, MOHFW

Table 8-1: Directorates under MOHFW and Responsible OPs

Abbreviation	Official name	Responsible OP (LDs)
DGHS	Directorate General of Health Services	MNCAH, ESD, CBHC, TB-LC, NASP, CDC, NCDC, NEC, HSM, AMC, IST, PSE, PMR, HIS, HEP, PLSM, NNS
DGFP	Directorate General of Family Planning	MCRAH, CCSD, FPFSD, PME, MIS-FP, IEC, PSSM
NIPORT	National Institute of Population Research & Training	TRD
DGDA	Directorate General of Drug Administration	SDAM
HEU	Directorate General of Health Economics Unit	HEF
HED	Directorate General of Health Engineering Department	
DNS	Directorate of Nursing Services	NES
RCHCIB	Revitalization of Community-based Healthcare Project (Community Clinics Project)	(CBHC)
EDCL	Essential Drug Company Limited	
TEMO	Transport & Equipment Maintenance Organization	
NEMEW	National Electro-medical & Engineering Workshop	

Source: Strategic Plan for HPNSDP 2011-2016, MOHFW, 2011.

DGHS is the main directorate for implementation of OPs. There are 12 departments in DGHS. The organogram of DGHS is shown in the figure below.



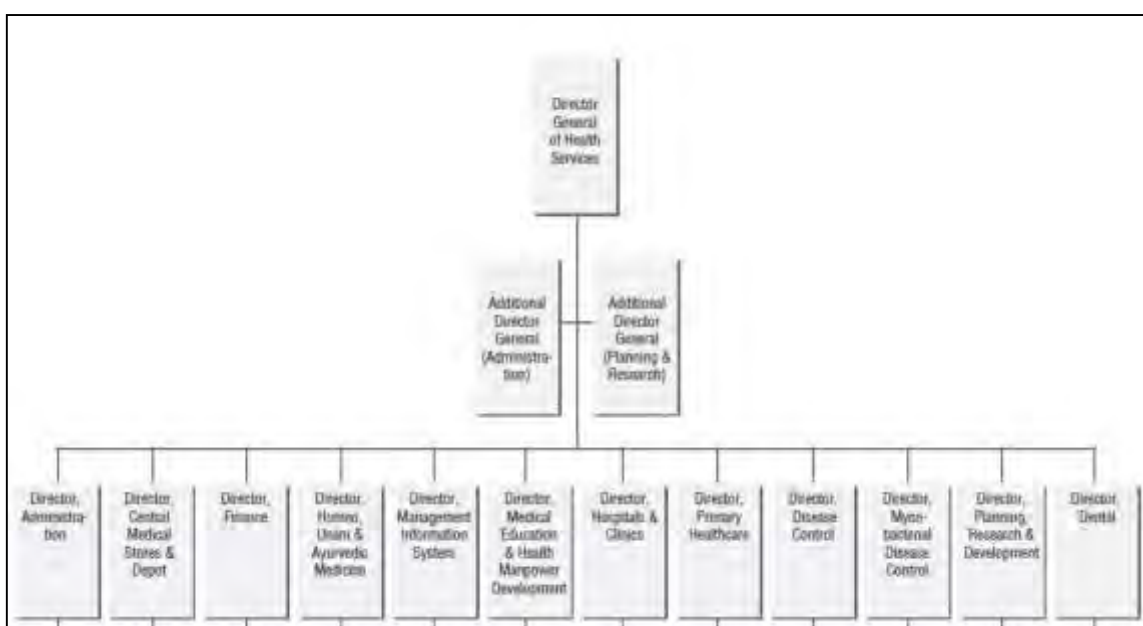


Figure 8-3: Administrative Setup of the DGHS

Source: Health Bulletin 2013, MOHFW

## (2) Implementing Agency for the sub-projects within HPNSDP 2011-2016

The Joint Chief of the Planning Wing is responsible for planning of HPNSDP 2011-2016. Therefore, the Joint Chief of the Planning Wing shall coordinate implementation of the sub-projects within HPNSDP 2011-2016, and OPs' Line Directors under the directorates shall be responsible for the project implementation with close communication among concerned OPs. The target 5 OPs of the sub-projects within HPNSDP 2011-2016 are; CBHC, HSM, MCRAH, NES and PFD. Summary of the responsibility of OPs for the implementation of the sub-projects is shown in Table 8-2.

Table 8-2: Responsible Directorates for Implementation of the Sub-projects within HPNSDP 2011-2016

OP	Responsible directorates	Sub-projects within HPNSDP 2011-2016
CBHC	RCHCIB (until Dec 2014), Primary Healthcare, DGHS	- CSG Training
		- Construction of CC
PFD	MOHFW	- New construction of nursing college hostel
NES	DNS	- Upgrade of academic buildings
		- Installation of skill laboratory equipment
HSM	Hospital & Clinic, DGHS	- Installation of medical equipment to 6 DHs
MCRAH	MCH services, DGFP	- Training for FWV
		- Procurement of MCH kits and FWC kits

## (3) Implementing Agency for the sub-projects beyond HPNSDP 2011-2016

The Joint Chief of the Planning Wing shall coordinate the implementation of the sub-projects

beyond HPNSDP 2011-2016. For the smooth implementation of sub-projects beyond HPNSDP 2011-2016, the Project Implementation Unit (PIU) will be established in the DGHS, MOHFW. The Project Steering Committee (PSC), the Project Implementation Committee (PIC) and Hospital Coordination Committee (HCC) will be organized for the project implementation as well. The main tasks of each organization unit are described below.

#### 1) Project Implementation Unit (PIU)

The main activities of PIU are;

- Carry out trainings to utilize imaging diagnostic equipment in the MCHs, including training of digital image ordering system for doctors, radiology technologists and receptionist
- Provide imaging diagnostic equipment in MCHs
- Construct new imaging diagnostic centers in MCHs

PIU will perform following roles and responsibilities for the implementation of the sub-projects in accordance with JICA and GOB Guidelines;

- Planning for overall implementation of the sub-projects,
- Procuring and managing the consultants,
- Conducting detailed designs,
- Verifying tender documents for construction,
- Supervising overall implementation of the sub-projects,
- Coordinating project-related organizations and other ministries, directorates of MOHFW and hospitals,
- Guiding the hospital coordination committee in each MCH,
- Certifying and checking the consultants' and contractors' bills,
- Ensuring compliance with environmental and social considerations,
- Reporting to the relevant organizations, including Planning Wing, MOHFW
- Holding progress review meetings with prepared monthly progress reports
- Coordinating project related organizations in each division to carry out trainings to utilize imaging diagnostic equipment

PIU consists of following members and headed by Director General, DGHS, MOHFW. The members of PIU will be selected from the existing DGHS officials, DOA architects and PWD engineers. Some new recruitment from outside will be needed for administration. Additional personnel expenses for administering PIU can be contracted as part of the project. The members are listed below.

- Project Director: Director General of Health Services, DGHS, MOHFW
- Deputy Project Director: Director of Hospital & Clinics, DGHS, MOHFW

- Unit Manager: Assistant Director of Hospital & Clinics, DGHS, MOHFW
- Facility Specialist: person in charge from DOA, MOHPW
- Facility Specialist: person in charge from PWD, MOHPW
- Equipment Specialist: person in charge from Hospital & Clinics, MOHFW)
- Equipment Specialist: person in charge from CMSD, DGHS, MOHFW
- Equipment Specialist: person in charge from NEMEW, MOHFW
- Senior Accountant: person in charge from Finance Department, DGHS, MOHFW
- Junior Accountant: necessary to employ during the project
- Coordinator: necessary to employ during the project
- Driver: necessary to employ during the project

## 2) Project Steering Committee (PSC)

PSC shall consists of following members, and chaired by Secretary, MOHFW to coordinate related agencies to monitor the progress of the project, and to make necessary decisions as stated in the TOR below.

- Secretary, Ministry of Health & Family Welfare :Chairperson
- Additional Secretary (Dev & ME), MOHFW
- Director General of Health Services
- Joint Secretary (Project Implementation), MOHFW
- Joint Chief(Planning Wing), MOHFW
- Director of Hospital & Clinics, DGHS
- Representative, DOA
- Additional Chief Engineer (Health wing), PWD.
- Representative of the Programming Division, Planning Commission
- Representative of the Planning Commission (SEI)
- Representative, ERD, Ministry of Finance
- Representative of the Ministry of Finance (Concerned Wing)
- Representative of the IMED (Concerned Sector)
- Deputy Chief, Planning Wing, MOHFW
- Deputy Chief (Health), MOHFW

### TOR of the PSC:

- Review quarterly implementation status of the project
- Review and determine requirement of Manpower
- Review and determine requirement of Equipment
- Monitor physical and financial progress of the project, and identify bottlenecks
- Take appropriate steps to remove the bottlenecks

- Adopt decisions for smooth functioning and implementation of the project
- Member-Secretary will provide secretarial service

### 3) Project Implementation Committee (PIC)

PIC shall consist of following members, and chaired by Director General, DGHS, MOHFW to coordinate related agencies to monitor the progress of the project, and to make suggestions as stated in the TOR below.

- Director General, DGHS, MOHFW: Chairperson
- Directors (Concerned Hospitals under this project)
- Deputy Secretary (Project Implementation), MOHFW
- Deputy Chief (Health/ FW), MOHFW
- Representative of the DGHS (Director, Hospital & Clinics)
- Representative of the DOA
- Representative of the PWD
- Representative of the Planning Commission (Concerned Sector)
- Representative of the Programming Division, Planning Commission
- Representative of the ERD
- Representative of the IMED (Concerned Sector)
- Senior Assistant Chief, Concerned Desk, MOHFW
- Project Director, "Component 2: Strengthening diagnostic imaging system":  
Member-Secretary

TOR of the PIC:

- Quarterly monitor of the implementation status
- Monitor physical and financial progress of the project, and identify bottlenecks
- Take appropriate steps to remove the bottlenecks
- Put specific suggestions to the appropriate authorities in respect of project implementation
- Member-Secretary will provide secretarial services

### 4) Hospital Coordination Committee (HCC)

HCC will be organized in each MCH for the sub-projects beyond HPNSDP 2011-2016. HCC will be established under the director of the hospital. HCC will perform the following roles and be responsible for the implementation;

- Coordinating project-related departments and building a consensus in the hospital
- Preparing implementation plans for the concerned sub-projects
- Carrying out surveys and investigations, if necessary
- Selecting trainees and coordinating the training programs

- Providing technical support for tender documents for the equipment procurement
- Supervising and checking the construction of the sub-projects conforming to the specified checking procedures

#### 5) Other relevant organizations

The sub-projects within HPNSDP 2011- 2016 will be coordinated and monitored by the existing Steering Committee of HPNSDP 2011-2016 as the Yen Loan Project Phase 1 has been.

### 8.1.2 Implementation Structure of Construction Project

#### (1) General

Since the independence of the country in 1971, there has been a great deal of improvement and diversification in the construction sector of Bangladesh. The construction sector has now emerged as a thriving and booming industry both in the public and private sectors. The construction sector has been generating an increasing number of employment opportunities and also opened the door to related industries such as vendors of construction materials.

Contractors operate under the umbrella of a professional organization, the Bangladesh Association of Construction Industries (BACI). BACI regularly holds seminars, technical sessions for keeping participants up-to-date with the current trends of technology and methodology of construction. Construction industries in Bangladesh generally use modern and up-to-date construction equipment and machines. For example major construction works in the largest cities and some other areas are being operated with modern facilities and equipment such as concrete batching plants, portable concrete plants, concrete pumps, tower cranes, and transit mixer.

Construction of high-rise buildings with multi-level-basement is nowadays very common. The use of concrete admixtures of various types, e.g. plasticizer, integral water proofer is very popular as well.

Construction of health medical-related facilities is rapidly increasing in both public and private sectors. During recent years in the metropolitan city of Dhaka, a number of large hospitals have been constructed, including the major high-level hospital projects mentioned below for reference.

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- **United Hospital (private sector)**

- Construction period: 2003 - 2006
- Total floor area: 400,000 Sft
- Numbers of beds: 450



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- **Square Hospital (private sector)**

- Construction period: 2003 - 2006
- Total floor area: 450,000 Sft
- Numbers of beds: 320



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- **Apollo Hospital (private sector)**

- Construction period: 2002 - 2005
- Total floor area: 400,000 Sft
- Numbers of beds: 450



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- **Kurmitola General Hospital (MOHFW)**

Phase-1

- Construction period: 2006 - 2010
- Total floor area: 750,000 Sft
- Numbers of beds: 500

Phase-2

- Construction period (planned): 2011 - 2013/2016
- Total floor area: 750,000 Sft
- Numbers of beds: 500



## (2) Contractors

Large numbers of construction contractors are engaged in the construction industries of Bangladesh. They work for both public and private sectors. Most of these contractors are registered on the following major organizations especially for health medical construction works.

- Public Works Department (PWD) / MOHPW
- Rajdhani Unnayan Kartipakkha (RAJUK) / MOHPW
- Health Engineering Department (HED) / MOHFW
- Local Government Engineering Department (LGED)

PWD has a total of 1,859 listed contractors for limited tender method (LTM). Those contractors are working in different wings of PWD. The PWD Health Wing has been working with 124 contractors for LTM. PWD categorized its listed contractors into 4 different categories shown below based on the following criteria.

Table 8-3: Criteria for Contractor Categorization under PWD

<ul style="list-style-type: none"><li>• Experiences of previous ten years (including on-going projects)</li><li>• Capability to execute of work volume and value<ul style="list-style-type: none"><li>- Human resources</li><li>- Machinery and equipment</li><li>- Bank solvency</li></ul></li><li>• Licenses (with appropriate update and/or renewal)<ul style="list-style-type: none"><li>- Trade License for Municipalities / City Corporation</li><li>- Associate Building and Contractors License</li><li>- Supervisory License</li></ul></li><li>• Tax payment<ul style="list-style-type: none"><li>- Tax Identification Number (TIN)</li><li>- Tax payment certificate</li><li>- VAT registration number</li></ul></li></ul>
--

Source: prepared by the Survey Team

Table 8-4: Categories and Respective Number of Contractors for LTM under PWD

Categories	Eligible for estimated value of Work	Number of contractors for LTM under PWD
Special Class / 1 <sup>st</sup> Class	Taka 50.0 million and greater	18
A Class / 2 <sup>nd</sup> Class	From Taka 10.5 million to Taka 50.0 million	23
B Class / 3 <sup>rd</sup> Class	From Taka 3.0 million to Taka 10.5 million	79
C Class / 4 <sup>th</sup> Class	Up to Taka 3.0 million	4

(Total: 124)

Source: prepared by the Survey Team

### (3) Materials

#### 1) General

Most of the standard construction materials including finishing materials except for special material such as metal shielding materials are available in local market. A brief outline regarding the production and availability of these materials in Bangladesh is given below.

#### 2) Rebar/Reinforcing Steel Bar

Rebar/Reinforcing steel bars are an important sub-project of reinforced concrete and reinforced masonry structures. They are usually formed from mild steel, and are given ridges for better frictional adhesion to the concrete. Reinforcing bars are available in grades and specifications that vary in yield strength, ultimate tensile strength, chemical composition, and percentage of elongation.

The grade designation is equal to the minimum yield strength of the bar in ksi (1000 psi) for example grade 60 rebar has minimum yield strength of 60 ksi. Rebars/Reinforcing steel bars are typically manufactured in grades 40, 60, and 72 in Bangladesh. Metric bar designations represent the nominal bar diameter in millimeters. Various Bar Sizes (6mm to 32mm) are available in Bangladesh and American Society for Testing and Materials (ASTM) Standards. Several Bangladeshi reinforcing steel manufacturing companies' names are given below:

- Bangladesh Steel Re-rolling Mills
- Kabir Steel Re-rolling Mills
- Anwar Steel Re-rolling Mills
- GPH Steel

#### 3) Cement

Portland cement is the most common type of cement used in Bangladesh. It is used as a basic ingredient of concrete, mortar and most non-specialty grouts. It is a fine powder produced by heating materials in a kiln to form what is called Portland cement clinker, grinding the clinker, and adding small amounts of other materials. Several types of Portland cement are available with the most common being called ordinary Portland cement (OPC) which is grey in color. A white Portland cement is also available. There are different standards of classification of Portland cement. The two major standards used primarily in Bangladesh are CEM-I and CEM-II.

##### i) CEM-I

CEM-I is made by clinker and gypsum is added as an inhibitor to prevent flash setting. This type of Portland cement is also known as OPC. It is commonly used for general construction



especially when making precast, high-rise structures and precast - prestressed concrete.

#### ii) CEM-II

CEM-II is generally known as Portland Composite Cement (PCC) in Bangladesh. This type of cement costs more than OPC. Both type of cement are available in Bangladesh and the strength rises to 15 MPa at 3 days, 23 MPa at 1 week, 35 MPa at 4 weeks.

#### 4) Bricks

There are two common types of bricks in Bangladesh as described below. Both are widely available throughout Bangladesh.

##### i) Normal or Standards Bricks

These bricks are of by clay or mud and the standard size of a brick is 9.5"x 4.5"x 2.75" according to PWD specifications. These bricks are formed manually or by machine and burnt in a kiln. This type of bricks is commonly used for general construction especially residential and hospital buildings in Bangladesh.

##### ii) Concrete Hollow Bricks

These bricks are made of sand and cement. Brick sizes vary but the most common size is 9.5"x 6"x 5". These bricks are made by machine and burnt in a kiln. This type of bricks is commonly used for special constructions and rates are higher than normal bricks.

#### 5) Aggregates

##### i) Coarse Aggregates

Stone aggregates are available in abundance, mainly in the districts of Sylhet, Rangpur, Dinajpur and Rajshahi (Chapai Nawabganj). These stone aggregates are crushed to various grades in stone crushing machines to meet the specifications.

Brick aggregates are also used as coarse aggregates for construction depending on the specifications of the construction work.

##### ii) Fine Aggregates

Fine aggregates are mainly sands of fineness modulus (F.M.) ranging from 0.8 to 2.5 depending on the nature and specifications of work. These sands are locally available in abundance throughout Bangladesh.

#### 6) Other finishing and related materials of construction

All finishing materials including aluminum frames, glass (up to 10mm thick) painting and polishing materials, wooden door and window frames made from good quality timber, hardware and accessories, and floor and wall tiles are locally manufactured and available in the local market. Also the Standard grade foreign floor and wall tiles (mostly from China and Malaysia)

are also readily available in the local market. Higher grade foreign tiles made in Spain and Italy are also available for high-end projects.

The names of some renowned local manufacturers /vendors of these materials are given below for reference.

Table 8-5: Available Local Vendors/Manufactures for Finishing Works in Bangladesh

Name of Vendors/ Manufacturers	Item(s) available in Bangladesh
Bangladesh Thai Aluminium Ltd	All aluminium frame profiles including related hardware.
Kai Aluminium Limited	
RAK Ceramics Tiles	All mirror polished and glazed tiles. Floor, Wall and Façade/Decor Tiles.
Mir Ceramic Tiles	
Great Wall Ceramic Tiles	
Fu-Wang Ceramic Tiles	
Nasir Glass Industries Ltd.	All types of tempered and normal float glass commonly used for general buildings. 3mm to 10mm thick glass.
PHP Glass Ltd.	
Barger Paints	All types of paints generally used for interior walls and exterior walls: plastic paint or distemper for interior walls, and weather coat or cement paint for exterior walls.
Elite Paints	
RAK Paints	

Source: prepared by the Survey Team

Marbles and granite are imported from foreign countries including India, Pakistan, China and Italy. Aluminium Cladding Panel (ACP) are imported mostly from China and Thailand. There are substantial numbers of local importers and vendors who market these materials for wholesale and retail markets.

#### 7) Materials for electro-mechanical items

PVC conduits and cables, distribution boards (except Type Tested Assemblies), switches and socket outlets are locally manufactured and are available on the local market. Galvanized iron pipes, mild steel (MS) pipes, stainless steel (SS) pipes, toilet fixtures & fittings are locally made and available on the local market. Some sub-projects and equipment of power substation are locally manufactured, some are assembled locally with imported sub-projects, and some are imported already made and assembled. For example transformers are locally made but high tension / low tension (HT/ LT) switchgears and power factor improvement (PFI) plants are assembled with foreign sub-projects. Additionally valves, air-conditioning equipment and accessories, and elevators are foreign made and assembled.

The names of some renowned manufacturers /vendors of these materials are given below for reference:

Table 8-6: Available Vendors/Manufactures for Electro-mechanical Items in Bangladesh

Name of Vendors/ Manufacturers	Capability in Bangladesh
Energypac Engineering Ltd.,	Transformer Manufacturer Assembler of HT/ LT switchgears and PFI plants
Adex Corporation Ltd.,	
Power Breeze Engineering Ltd.,	
Betelco	
MAM Power	
AEG	
Energypac Ltd.	Agent of FG Wilson Generators, UK
Navana Interlink Ltd.	Agent of Kohler(UK) and Mitshubishi (Japan) Generators
Jakson International Ltd.	Agent of Cummins Generators, UK
Cross Worlds Ltd.	Agent of Tempest Generators, UK
Bangla Cat	Agent of Caterpillar Generators, UK

Source: prepared by the Survey Team

#### 8) Specific materials for shield rooms against radiation and electromagnetic wave from imaging diagnostic equipment

Radiation apparatus especially CT scanner and Angiography typically have high workloads and high kilo-voltage technique settings. As a result, at least 1/16-inch lead shielding or equivalent is required for the walls, doors, floors, ceilings, and operator's barrier. The concrete equivalence of 1/16-inch thick lead would be about 4 to 6 inches of standard-density concrete (147 pounds per cubic foot). CT room with high workloads and with fully occupied uncontrolled space directly adjacent to the scanner may need shielding that is thicker than 1/16-inch lead or 4 to 6 inches of concrete to meet the recommended NCRP Report No.147<sup>1</sup> shielding design goal of 0.02 mGy/ week (1 mGy/ year) for persons in uncontrolled areas. Besides, MRI examination is necessary to shut down the electromagnetic wave coming from the outside and to protect leaking powerful electromagnetic waves from the MRI device to outside. Also it is important to prevent strong magnetic field lines leaked to outside MRI from affecting the other medical devices and the human body (such as patient embedding cardiac pacemaker).

However, the materials for lead shielding against radiation emission and copper shielding against electromagnetic wave are not available in the country. Equipment rooms requiring shielding of radiation are made and installed with the materials and specification of the particular manufacturer supplying the equipment.

At the same time, these equipment rooms must also meet the requirements of the Bangladesh Atomic Energy Commission in terms of permissible level of radiation. Thus, as a local adopted technology, dense concrete walls, slabs etc. of much higher thickness (600mm to

<sup>1</sup> The National Council on Radiation Protection and Measurements (NCRP) was chartered by the U.S. Congress in 1964. Report No.147" Structural Shielding Design for Medical X-Ray Imaging Facilities" presents recommendations and technical information related to the design and installation of structural shielding for facilities that use x rays for medical imaging.

3600mm) are constructed depending on the requirement to meet the allowable degree of radiation prescribed Bangladesh Atomic Energy Commission. Private hospitals tend to adopt the way in Bangladesh. (Public hospitals actually do not meet the requirements of the Bangladesh Atomic Energy Commission though they are also requested to adopt the way in Bangladesh)

#### 9) Heavy-duty equipment and machinery

Heavy-duty equipment, machinery, and concrete batching plants are available in the private and public sector construction industries. They include mainly concrete batching plant, concrete mixture track, concrete pump, tower cranes, track mounted crane, welding machine, portable generator, and pile driving equipment and are owned by most of the 1st class: "A" class contractors of the private sector and of PWD. Other contractors rent these heavy-duty equipment and machinery from equipment stores such as PWD and RAJUK.

#### (4) Availabilities of materials in Bangladesh

The availabilities of materials in Bangladesh for the major items of works are shown below.

Table 8-7: Availabilities of Materials in Bangladesh

Type of work	Materials	Availability of the Materials	Remarks (any differences among areas in Bangladesh)
Reinforced concrete work	Portland cement, fine aggregate(sand), coarse aggregate, reinforcement bars	Available	There is no problem/difference for availability throughout the country.
Masonry work	Bricks	Available	There is no problem/ difference for availability throughout the country.
Waterproofing work	Asphalt roofing, urethane resin, Waterproofing Sealing	Available	Urethane resin not commonly used
Stone work	Stone	Available	There is no problem/ difference for availability throughout the country.
Tile work	Porcelain tile	Available	There is no problem/ difference for availability throughout the country.
Carpentry work	Timber, Laminated wood, Plywood	Available	There is no problem/ difference for availability throughout the country.
Metal work	Light-gauge steel (LGS)	Available	There is no problem/ difference for availability throughout the country.
Plaster Work	Plaster	Available	There is no problem/ difference for availability throughout the country.
M&E Work	Transformer, Generators	Available	There is no problem/ difference for availability throughout the country.
Shielding Work	Specific materials	Not available	This work is not adopted in Bangladesh.

Source: prepared by the Survey Team

(5) Advantages of Japanese Materials / Products

Japanese materials and/or products for construction works listed in the table below have significant advantages, and are widely recognized for;

- Having superior performance, durability, and quality stability
- Being environmentally friendly
- Providing superior customer service and maintenance services
- Having the latest technologies for water treatment and energy conservation

Table 8-8: Superior Japanese Materials/Products

No.	Materials / Products	Manufacturer	Existence of Branch Office in Bangladesh	Availability for construction work in Bangladesh	Availability for maintenance work in Bangladesh
Architecture					
1	Ceiling board, base frame, inspection door	Daiken Corporation	No	CIF based material export	No
		Naka Corporation	No	No records	No
		Fukuvi Chemical Industry	No	CIF based material export	No
2	Aluminum fittings	Fujisash Co Ltd	No	CIF based material export	No
		YKK AP	No	CIF based material export	No
		LIXIL	No	CIF based material export	No
3	Light steel fittings	Bunka Shutter Co Ltd	No	CIF based material export	No
		Sanwa Shutter Corporation	No	CIF based material export	No
4	Steel Hanging Door	Bunka Shutter Co Ltd	No	CIF based material export	No
		Sanwa Shutter Corporation	No	CIF based material export	No
5	Infrared-reflecting glass	Nippon Sheet Glass Co Ltd	No	CIF based material export	No
		Asahi Glass Co Ltd	No	CIF based material export	No
		Central Glass Co Ltd	No	CIF based material export	No
6	Latent heat cooling panel system	Kaisui Chemical Industry Co Ltd	No	No records	No
7	Long vinyl chloride sheet	Toli Corporation	No	CIF based material export	No
		Tajima Inc	No	CIF based material export	No
		Sangetsu Co Ltd	No	No records	No
8	Free access floor	Naka Corporation	No	No records	No
		Hitachi Metals Techno Ltd	No	No records	No
		NICHIAS Corporation	No	No records	No
Electricity					
9	Emergency power generators	YANMAR Co Ltd	No	Equipment supply only	Available (mobilized from

No.	Materials / Products	Manufacturer	Existence of Branch Office in Bangladesh	Availability for construction work in Bangladesh	Availability for maintenance work in Bangladesh
					Singapore branch office)
		Mitsubishi Heavy Industries Ltd	Yes	Available	Available from local branch office
10	Photovoltaic (PV) power generating system	Sharp Corporation	Yes	Available	Available from local branch office
		Kaneka Corporation	No	Unavailable	Unavailable
11	Automatic fire alarm system	Nittan Co Ltd	No	Unavailable	Unavailable
		Hochiki Corporation	No	Unavailable	Unavailable
		Nohmi Bosai Ltd	Yes	Equipment supply & tests only	Available from local branch office
<b>Machinery</b>					
12	Total enthalpy heat exchanger	DAIKIN INDUSTRIES Ltd	Yes	Available	Available from local branch office
		Mitsubishi Electric Corporation	Yes	Available	Available from local branch office
		Panasonic	Yes	Available	Available from local branch office
13	Boiler	Hirakawa Corporation	No	Unavailable	Unavailable
		Takao Boiler	No	Unavailable	Unavailable
		Kawasaki Terminal Engineering	No	Unavailable	Unavailable
14	Water receiving tank	BELTECNO Corporation	No	Unavailable	Unavailable
		Morimatsu Industry Co Ltd	No	Unavailable	Unavailable
		Bridgestone Corporation	No	Unavailable	Unavailable
15	Plumbing fixtures	TOTO	Yes	Available	Available from local branch office
		INAX	No	Unavailable	Unavailable
16	Medical gas equipment	Central Uni Co Ltd	No	Unavailable	Unavailable
		Air Water Inc	No	Unavailable	Unavailable
17	Wastewater treatment equipment	Kubota Corporation	No	Unavailable	Unavailable
		Organo Corporation	No	Unavailable	Unavailable
		Goshu Kohsan Co Ltd	No	Unavailable	Unavailable
18	Examination wastewater treatment equipment	Tohzai Chemical Industry Co Ltd	No	Unavailable	Unavailable
		Organo Corporation	No	Unavailable	Unavailable
		Kubota Corporation	No	Unavailable	Unavailable
19	Rainwater treatment equipment	Tohzai Chemical Industry Co Ltd	No	Unavailable	Unavailable
		Organo Corporation	No	Unavailable	Unavailable
		Kubota Corporation	No	Unavailable	Unavailable
20	Kitchen equipment	Maruzen Co Ltd	No	Unavailable	Unavailable
		Fujimak Corporation	No	Unavailable	Unavailable
		Nihon Choriki Co Ltd	No	Unavailable	Unavailable

No.	Materials / Products	Manufacturer	Existence of Branch Office in Bangladesh	Availability for construction work in Bangladesh	Availability for maintenance work in Bangladesh
21	Surgey panel	Central Uni Co Ltd	No	Unavailable	Unavailable
		Air Water Inc	No	Unavailable	Unavailable
22	Elevator	Mitsubishi Electric Corporation	Yes	Handle material processing	Yes
		Hitachi Ltd	No	Imported from India, case-by-case installation	Available from India
		Fujitec Co Ltd	No	Imported from India, case-by-case installation	Available from India

Source: prepared by the Survey Team

## (6) Guidelines and methodologies for facility procurement

### 1) Guidelines for procurement

Procurement for public utilities in Bangladesh is required to conform to the Public Procurement Rules 2008 (published by the Ministry of Planning in April 2008; “PPR2008” hereafter) and the Public Procurement Act 2006 (published by the Ministry of Law, Justice and Parliamentary Affairs Legislative and Parliamentary Affairs Division in July 2006; “PPA2006” hereafter).

In addition, the World Bank published the “Guidelines Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers” in January 2011. The purpose of these Guidelines is to inform those carrying out a project that is financed in whole or in part by a loan from the International Bank for Reconstruction and Development (IBRD), a credit or grant from the International Development Association (IDA), a project preparation advance (PPA), a grant from the Bank, or a trust fund administered by the Bank and executed by the recipient, of the policies that govern the procurement of goods, works, and non-consulting services required for the project. Recently, MOHFW and PWD have no experience in project beyond national program. Therefore, Guidelines for Procurement under Japanese ODA Loans will apply for sub-project beyond HPNSDP 2011-2016.

### 2) Methodology of facility procurement

Every facility procurement in Bangladesh is executed according to PPR2008<sup>2</sup> and PPA2006<sup>3</sup>. The implementation procedure for the projects for public medical facilities and concerned departments in charge are shown in Figure 8-4. (Projects for military hospitals or aid projects are by no means limited to this.) This procedure is developed based on the procedure of the current HPNSDP. The procedure for the sub-projects beyond HPNSDP is assumed to take the similar procedure as the one which World Bank applies, because there are not any specific rules and MOHFW and PWD have no experience in project beyond national program.

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<sup>2</sup> Issued by CPTU (Central Procurement Technical Unit) under the Ministry of Planning

<sup>3</sup> Issued by CPTU (Central Procurement Technical Unit) under the Ministry of Planning



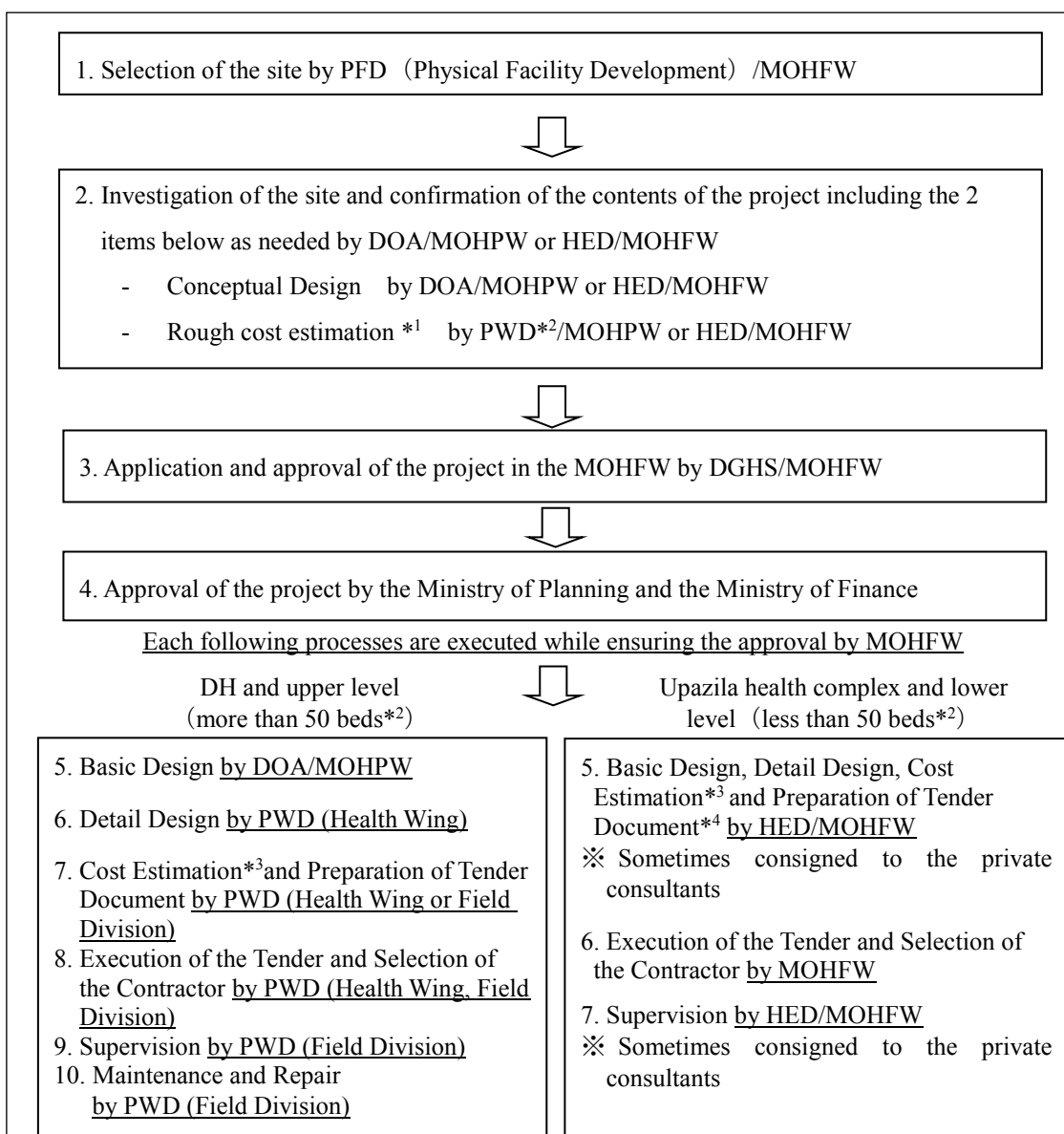


Figure 8-4: Operation Procedure and Department for Public Health Facility Construction Project  
Note:

\*<sup>1</sup>Calculated by Schedule of Rate for Civil Work 2014 (issued by PWD)

\*<sup>2</sup>The assignments of design works for facilities which have 50 to 100 beds shall be distributed to either depending on the situation.

\*<sup>3</sup>Handled by Field Division under PWD in case it is located.

\*<sup>4</sup>CPTU (Central Procurement Technical Unit) under the Ministry of Planning provides the standard form of Tender Document.

Source: prepared by the Survey Team

As described in the figure above, from the basic design for DHs and upper level are implemented by the organizations: DOA and PWD which are not under MOHFW. In order to clarify the responsible authority of each phase, the implementing authorities who give approval for each phase and necessity of approval from MOHFW are shown in the table below: Table

Table 8-9: Responsible Authorities for Each Phase of DHs and Upper Level

	Persons in charge / Prepared by	Approved by	Necessity of approval from MOHFW
Basic design	DOA	Chief Architect / DOA	Counter signed from DGHS of MOHFW is required.
Detailed design	PWD (Health Wing)	Superintending Engineer of concerned Design Circle / PWD.	No need.
Cost Estimation	PWD (Health Wing)	As per Delegation of Financial Power ./ MOHPW	No need.
Tender Document	PWD (Health Wing)	As per Delegation of Financial Power. / MOHPW	No need.
Tender	PWD (Health Wing)	Head of Procuring Entity /MOHFW (In case of works under PWD (Health Wing), head of procuring entity belongs to MOHFW.)	<u>Approving Authority</u> If tender value is more than 140 million Taka, approval from MOHFW is required as below: <ul style="list-style-type: none"> <li>- More than 140 to 200 million Taka: Secretary of MOHFW</li> <li>- More than 200 to 250 million Taka: Minister of MOHFW</li> <li>- More than 250 million Taka: Cabinet Committee of Govt. Purchase (CCGP)</li> </ul>
Contract agreement	PWD (Health Wing)	Head of Procuring Entity /MOHFW (In case of works under PWD (Health Wing), head of procuring entity belongs to MOHFW.)	<u>Approving Authority</u> If tender value is more than 140 million Taka, approval from MOHFW is required as below: <ul style="list-style-type: none"> <li>- More than 140 to 200 million Taka: Secretary of MOHFW</li> <li>- More than 200 to 250 million Taka: Minister of MOHFW</li> </ul> More than 250 million Taka: Cabinet Committee of Govt. Purchase (CCGP)
Construction supervision	PWD (Field Office)	Concerned Executive Engineer.	No need.
Maintenance / Repair	PWD (Field Office)	Concerned Executive Engineer.	No need.

Source: prepared by the Survey Team

### 3) Laws applicable to the maintenance of facilities

In general, the construction of public facilities in Bangladesh is carried out in compliance with the Acts shown in the table below. Among these, the Building Construction Act 1952 and the Bangladesh National Building Code 1993 (BNBC93) are the standards that take precedence.

Structural calculations, in particular, must be based on BNBC93, which is the original standard

in Bangladesh. BNBC93 follows on from UBC94 (Uniform Building Code), which was established and published in 2006. There are no construction standards to be met by buildings prior to this.

At present (December 2014), the BNBC is being revised for the first time. This revision is based on the successor to the UBC, IBC2006 (International Building Code). The main points for review confirm that the limitation on inter-story deformation angles in structures and earthquake loads, etc., increases the strength of the structure.

Table 8-10: Laws Applicable to Public Building Construction in Bangladesh

Name of Building Construction Acts, Rules and Code
1. Building Construction Act 1952
2. Bangladesh National Building Code 1993
3. Building Construction Rules 1996
4. Dhaka Metropolitan Building Construction Rules 2008

Name of Associated Acts related to Building Construction
5. Bangladesh Environment Conservation Act 1995
6. Fire Control and Protection Act 2003
7. Town Improvement Act 1953 (CDA ordinance 1959)
8. Cantonment Act 1924 (Building Construction Rules 1985)
9. Private Housing (Land) development ordinance 2004
10. Open Space and Wetland Preservation Act 2000
11. Public Park Act 1904
12. Antiquity Act 1968
13. City Corporation Act
14. Municipal Ordinance 1977

Source: provided by DOA

### 8.1.3 Procurement for Medical Equipment

In Bangladesh, production of major medical equipment with the exception of such as bed is not available. Also, medical equipment manufacturers have not located their factories to expand their production in Bangladesh for now. Therefore, sale of medical equipment has been done in the import by branches of Euro-American medical equipment companies and many medical equipment sales companies in Bangladesh. Many of medical equipment products in Japan are sold through sales companies with maintenance services. (Only one Japanese leading manufacturer provides their products with maintenance through a Japanese sales and technology company specialized in South Asia which have distributorship.) The headquarters of Japanese manufacturers do not manage the sales companies in Bangladesh directly. Branches in

Singapore and Bangkok in Thailand deal with those companies. Mostly those sales companies are dealers of manufactures of not only Japan but also Euro-America, China and India. In contrast, Euro-American major three companies have their branches and they have production base in India and advantage of big distribution network. Therefore, the managers of branches in Dhaka are dispatched from India. MOHFW and medical societies request manufactures to establish their service centers to improve quality of maintenance services. Since the market in Bangladesh is small, they have not had these centers. However, improvement both of maintenance and services is required to correspond to the increase of future demand of medical equipment in Bangladesh.

The procurement of medical equipment for public health facilities is required to conform to PPR2008 and PPA2006. In addition, the procurement is required to conform to “Guidelines Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers” if the funding resources are the Government of Bangladesh (GOB) or Reimbursement Project Aid (RPA) by the pool fund.

The procurement of medical equipment for secondary and tertiary hospitals is managed by the Director of Hospital & Clinics (Line Director of HSM OP) for planning and the Director of CMSD of DGHS for tendering under MOHFW’s approval.

The procedure of the procurement is shown in Figure 8-5.

#### (1) Requisition and Planning of procurement

- 1) Secondary and tertiary hospitals request to DGHS for necessary medical equipment.
- 2) Director of Hospital & Clinics (Line Director of HSM OP) receives their requisitions.
- 3) Requirement Committee reviews their requisitions.
- 4) Requirement Committee decides the Annual Procurement Plan.
- 5) Procurement and Logistics Management Cell (PLMC) in MOHFW approves the Annual Procurement Plan.
- 6) If the funding resource is RPA, the Annual Procurement Plans are sent to CMSD after the approval by World Bank (WB) or JICA depending on the funding source. If the funding resource is GOB, the Plan is sent to CMSD directly.

#### (2) Tender (Single-Stage Two Envelope Bidding)

The process of procurement is shown in the Figure 8-5.

- 1) After CMSD receives the Annual Procurement Plan, CMSD arranges “Sub-technical committee (Specification committee)” composed of 5-7 members;

- A Chairman (Line director of HSM),
  - Member secretary (Deputy Director of CMSD),
  - National Electro-medical & Engineering Workshop (NEMEW),
  - Engineers,
  - Specialists (e.g. radiologists),
  - Users in hospitals,
  - Relevant technical persons.
- 2) The committee decides the specification package of the items and CMSD estimates the cost.
  - 3) If the funding resource is the pool fund and the amount is more than 1 million USD, a prior review for the package by WB is required. If the funding resource is other DP's fund, this clearance is not necessary.
  - 4) After the WB clearance, CMSD advertises a bidding notice as Invitation for Bidding (IFB) before 28 days of bidding for Local Competitive Bidding (LCB) or before 42 days for International Competitive Bidding (ICB).
  - 5) Supplier's meeting (Pre-bidding) is held 14 days before the bidding.
  - 6) The suppliers submit their bidding documents and financial bids by the tender dropping and closing date and time.
  - 7) Preliminary examination of bidding documents is conducted by Tender Evaluation Committee (TEC). TEC is composed of 7 members as follows;
    - Chair: If the amount is more than 10 crore Taka, Director of DGHS. If less than 10 crore Taka, Additional Director of DGHS
    - Line Director of HSM OP, DGHS
    - Director of Primary Healthcare, DGHS
    - Representative of Land & Survey (Deputy Director, Directorate of Land Research and Survey: DLRS), Ministry of Land and Survey
    - Representative of Director of Bangladesh Government Press (BG Press), Ministry of Public Administration
    - Representative of MOHFW (Joint Secretary)
    - Director of CMSD (as a Member Secretary)
  - 8) At the same time of 7), Technical sub-committee examines the equipment proposed technical aspects
  - 9) The financial bid is opened in front of Tender Opening Committee (TOC) after the examination of bidding documents. The committee is composed of 3 members, Director of CMSD, Deputy Director of CMSD and a Desk Officer.
  - 10) TEC makes Bid Evaluation Report (BER).
  - 11) MOHFW (PLMC) approves BER. If the funding resource is the pool fund and the cost is lower than 1 million USD, a post review by WB is required after the MOHFW's approval.

(3) Contract

- 1) CMSD issues the Notification of Award within 7 days.
- 2) The first awarded supplier submits the Performance Guarantee (PG) with 10% of the contract price deposit within 28 days. If the awarded supplier cannot afford to do so, it can be replaced by the second awarded supplier.
- 3) Contract is made between CMSD and the supplier.

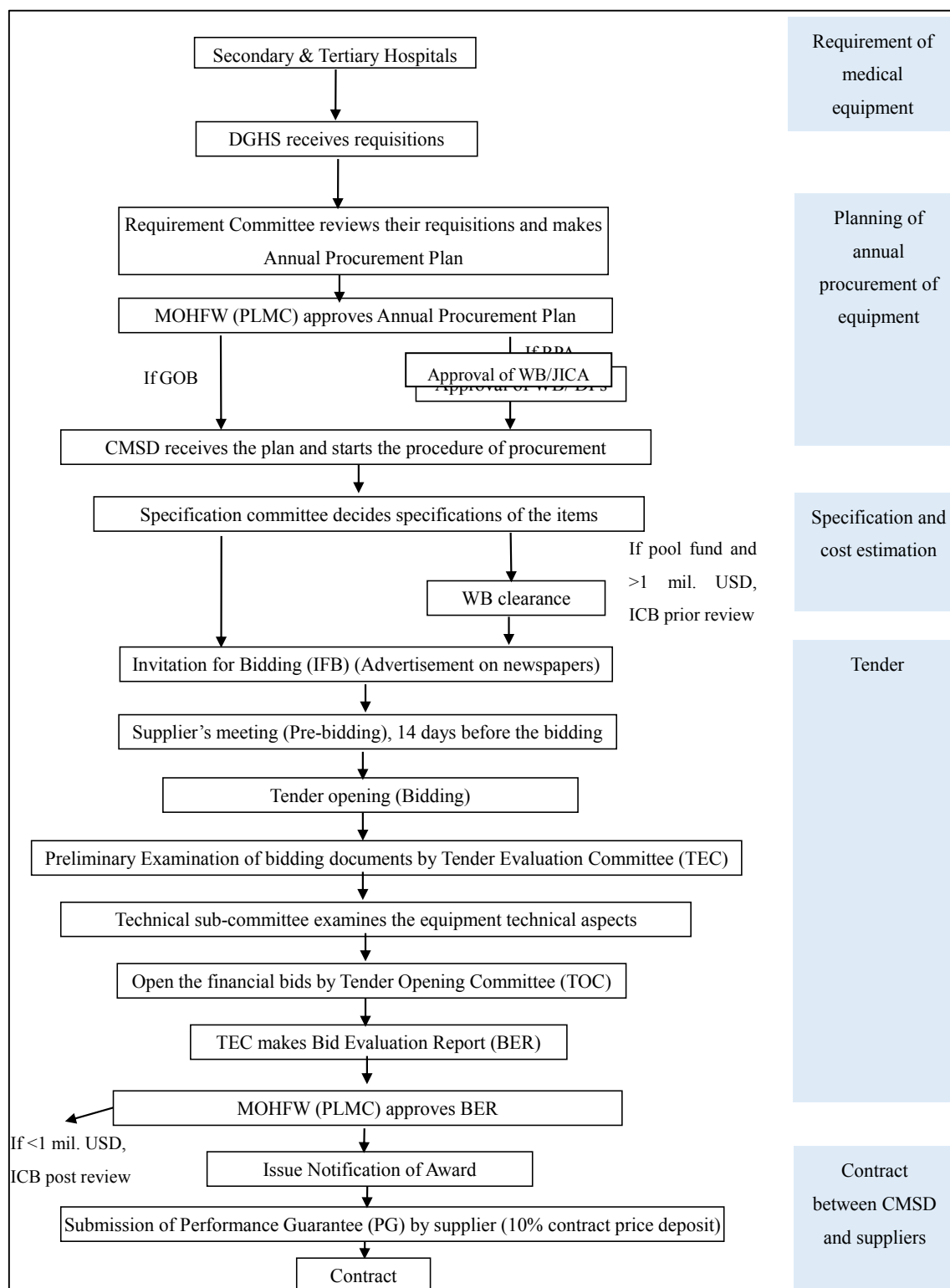


Figure 8-5: Procedure of Procurement of Medical Equipment

Source: Interview with HSM, CMSD and MSH (Management Science for Health)

The skill laboratory equipment will be procured by CMSD in LCB.

## 8.2 Operation and Maintenance Structure

### 8.2.1. Finance of Operation and Maintenance Organizations and Relevant Agencies

#### (1) MCHs

MCHs belong to MOHFW and their budget allocation is directly coming from MOHFW in the regular procedure. Annual revenue budget of MCHs consists of 4 particulars such as Salary, Delivery and Services (Medical and surgical equipment and Food and others), Maintenance and Repair, and Collection and purchasing of assets. While salary including allowances accounts for more than 50 % of total budget, the budget for maintenance and repair account for only 0.2 to 1.9%. The budget for maintenance and repair covers infrastructure, medical equipment, vehicles and furniture and fixtures and office equipment. It seems that it is insufficient to manage their maintenance for a year. Utility cost such as electricity and water supply is included into the cost of Delivery & Services. In case new imaging diagnostic equipment is replaced for existing old machine, additional operational cost such as electricity and/or water is not necessary. Additional operational cost will be required if the new equipment is additionally installed in the hospital without replacement. However, the cost for new equipment may become cheaper than old machines existed if the equipment to be installed is a new model with energy-saving\*. Moreover, long-term maintenance contract for high-level equipment, such as MRI, CT scanner and angiography, will be included in the loan, so that MOHFW/DGHS does not need to account for this maintenance budget. However, the special budget allocation would be required depends on the loan schedule.

(\*Some Japanese manufactured new MRI can save electricity consumption around 30 % and Ultrasound can also save it 15% in comparison with previous model)

#### (2) Operation cost of imaging diagnostic center

Outline of operation cost of imaging unit and equipment are electricity and consumable. The main electric consumptions are air-conditioner, imaging diagnostic equipment and PACS / RIS server computer and network. New air-conditioner and imaging diagnostic equipment will be the energy saving type and can decrease electric consumption than present model. And new building is completed with air shield and has heat resistance to reduce electric cost from present situation. However basically PACS / RIS computer server, network consul and air-conditioner of sever room run for 24 hours with increases electric. As a result of the total electric consumption will seem to be almost same as present.

The other operational cost is medical consumable for each imaging diagnostic equipment. Basically the X-ray equipment and MRI can be reduce and minimize number of X-ray film to read monitor directly and save image in the PACS as digital information. Also the ultrasound equipment and endoscope can be minimized number of printout picture to save image in the



PACS. However, the medical consumable such as gel for ultrasound equipment and disinfection solution for each endoscope examination with the increase in the number of apparatus.

### (3) Maintenance cost of imaging diagnostic center

Main concerned maintenance cost is for MRI and CT, however those costs will be counted in the Project. International tender of major equipment in MOHFW is provided 5 years warranty (1 year manufacture warranty and 4 years supplier warranty) with spare parts cost. In this project will plan to provide additional 5 years maintenance service support same as the 4 years supplier warranty. Almost 10 year maintenance support by supplier or agent service should be provided for all of imaging diagnostic equipment and software totally.

## 8.2.2. Operation and Maintenance Organization and Relevant Agencies

### (1) MCH

The sub-project beyond the HPNSDP is the establishment of imaging diagnostic center at seven MCHs. In that case, those MCHs will be a part of operation and maintenance organization of the sub-project. In particular, each MCH will organize HCC to coordinate with PIU in DGHS, MOHFW for implementation activities at site. HCC members will be selected from necessary departments to share the information and to work for implementation on construction, equipment procurement and staff training plan. Figure 8-6 shows the organization chart of HCC. Organograms of each MCH are available in Annex 21.

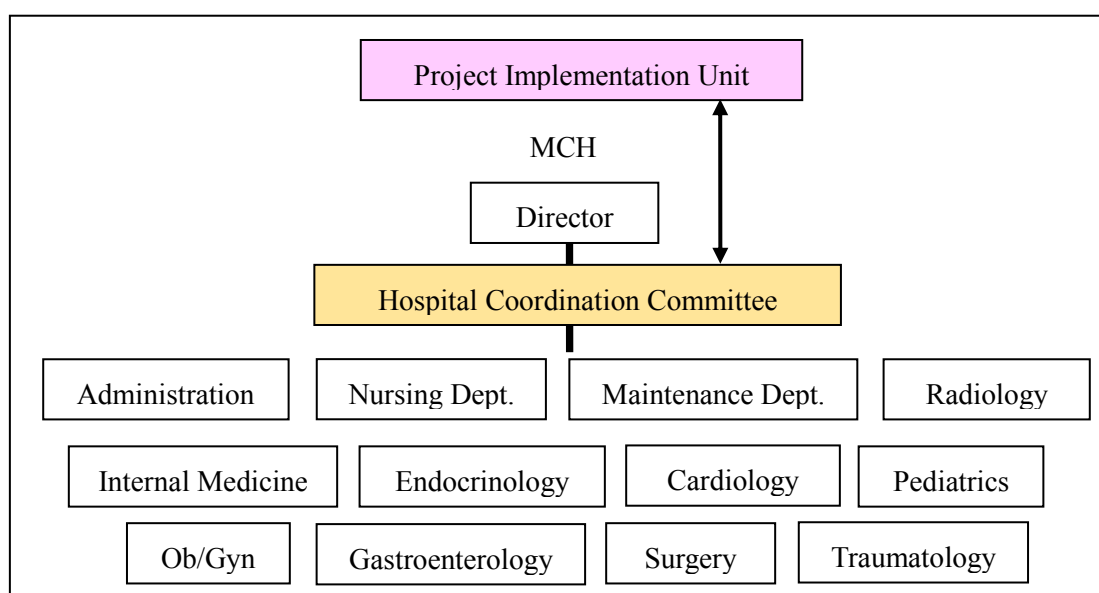


Figure 8-6: Organization Chart of HCC

The management and maintenance of imaging diagnostic equipment and software system are basically hospitals' responsibility. It is suggested that a committee of imaging diagnostic equipment is established. Under the direct control of director at hospitals, a deputy director takes essential responsibility for the committee, which is expected to hold a meeting at least once in half a year for discussing the achievements and challenges. Radiology department is basically in charge of the management of the Center. However, the department is not responsible for the procurement of expendable supplies and other costs. Since the maintenance of equipment is done by contracted makers' agencies, technical support would be provided as necessary. Other management situations are contained in RIS in which operation time and the number of photographed images are automatically recorded and stored.

## (2) DH / Civil Surgeon Office

DHs will be responsible for operation and maintenance of the sub-project to provide medical equipment for the renovated and/or expanded DHs within HPNSDP 2011-2016. The Civil Surgeon is the district health manager responsible for delivering secondary and primary care services. In each district, there is a DH. Some DHs have superintendents to look after the hospital management. In others, Civil Surgeons look after the DHs. The figure below shows the managerial hierarchy from District to DGHS.

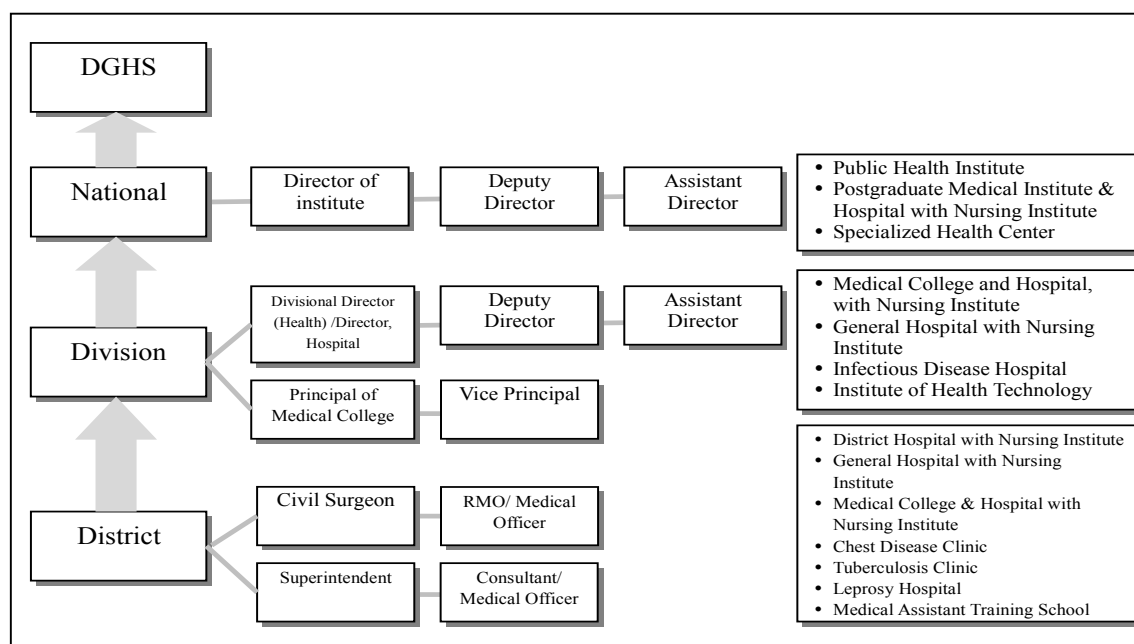


Figure 8-7: Types of Facilities from National to District Level with Managerial Hierarchy

Source: Health Bulletin 2013, MOHFW

For procurement and installation of equipment for DHs, Civil Surgeon is the responsible person.

The procedure of procurement for DHs is same as MCHs. First of all, DHs request the medical equipment through Civil Surgeon send their requisition. CMSD delivers the equipment to final site and Civil Surgeon or person in charge of hospital receive the equipment.

### (3) DGHS

DGHS has an own planning and research department for development project. The department should be required to study and additional coordination regarding to the loan budget for maintenance contract.

### (4) National Equipment Maintenance and Engineering Workshop (NEMEW)

In general, NEMEW is in charge for maintenance supervision for MCHs. This role will be adopted for the equipment from the project as well. Medical technicians (radiographer) and the person in charge at DEMEW which is a local branch of NEMEW are required to monitor the software since it installs a management system which can regularly report the situation.

Repair for the broken equipment is promptly done after the reporting of technicians to the agency on the basis of RIS report. After the repair situation is reviewed by persons in charge from DEMEW, repair is completed. Confirmation by some staff is needed even though automatic confirmation is possible through the report on the log. The Survey Team considers that it is necessary to organize specialized training on basic imaging diagnostic system and maintenance contract intended for persons in DEMEW. Their role is not to repair the equipment but to detect causes of breakdown, confirm the process of its improvement and to manage it. Therefore, training should include technical aspects of equipment and management work, both of which are not so familiar to them.

## 8.2.3 Operation and Maintenance Structure

### (1) Composition of the Members of Implementation Organization

The committee of imaging diagnostic center is expected to promptly handle and deal with any issue through the discussion and regular information sharing. Even though maintenance fee of equipment is included as guarantee and assured for smooth operation technically, equipment agents are expected to handle hardware (equipment itself) and software (data processing system) constantly for cooperating between user (committee of imaging units) and manufacturer for stable operation and management. The figure below shows the committee of Imaging Unit and management.

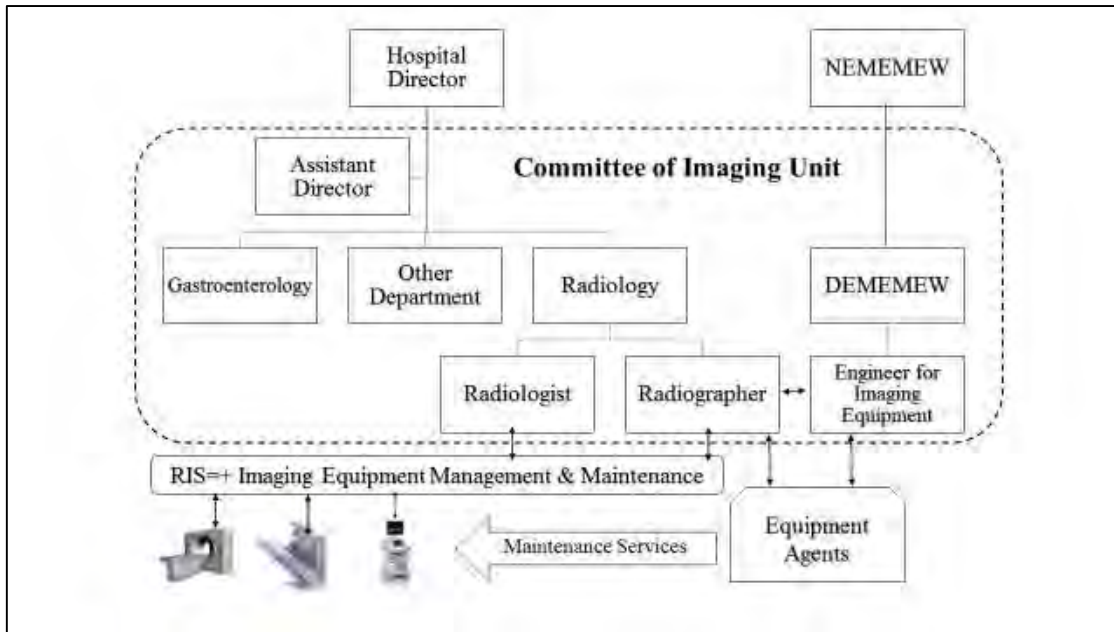


Figure 8-8: Management and Maintenance System for Imaging Diagnostic Equipment

(2) Plan of Recruitment of Staff to achieve the Composition in the above mentioned

It would be necessary to establish an Information Technology (IT) group in the MCH (if it does not currently have one) and as well as including IT engineers on the committee to support PACS and RIS operation and maintenance. Thus, in case of the need for further personnel recruitment, the additional recruitment would be better applied before equipment installed to harmonize with operational training.

Furthermore, future recruitment of personnel in DEMEW positions would be necessary, when considering service years of the incumbents in DEMEW.

(3) TOR, Selection, Qualification, Pay scale in case of Recruitment of External Human Resources

DEMEW staffs and medical staffs in MCHs are basically government employees and obey the public regulation for recruitment. Also their TOR and qualification and salary are already decided, and there is no need to add special requirement for new equipment. Technical capability of medical staffs is already assessed as sufficient.

(4) Planning of Training for Operational and Maintenance Staff

DEMEW is in charge of operation and maintenance management. However, most of high-level equipment depends on manufacturer's maintenance. Thus, what DEMEW has to do is quite limited for maintenance.

Besides, operational training is significantly important including user maintenance for

prolonging the life and keeping the good performance of equipment. Such trainings are better provided to the medical staffs, such as doctors and medical technicians and sometimes assigned nurses will be trained by the project in accordance with their work.

### 8.3 Evaluation of the Project

#### 8.3.1 Operation and Monitoring Indicators for Post Implementation Stage Evaluation

The JICA evaluates ODA loan projects to (i) improve its assistance, (ii) monitor and provide feedback for effective resource allocation, and (iii) assure accountability. As part of its results-based management system, the JICA is trying to establish a coherent evaluation system throughout the project cycle and enhance joint evaluations for capacity development.

Operation and effect indicators are intended to quantitatively measure the Project's operational performance and effects in light of its objectives. These indicators include target figures for intermediate supervision during implementation, and post completion monitoring and ex-post evaluation.

Because the Project includes two components with different goal values and timing, it is necessary to set optimal indicators for each goal. Component-1 partially contributes to HPNSDP 2011-2016, and goals have already been set. Indicators are quoted from the plan when the sub-components match OP's direct investment activities. Regarding investment for BSc nursing colleges which is related to JICA's future technical cooperation, the quantitative and qualitative indicators are set as described below. The indicators are not originated from OPs because relevant indicators are not available in OPs for this investment. Component-2 is an independent activity, and its indicators are set following JICA evaluation.

(1) Indicators for Sub-projects within HPNSDP 2011-2016 (Improving MNCH and the Health System under HPNSDP 2011-2016)

Table 8-11: Indicators for Sub-projects within HPNSDP 2011-2016

Quantitative Indicators	Original (Yr 2014)	Target (Yr 2016)
Number of Community Support Groups trained	37,731	48,000
Percentage of delivery by skilled attendant	34.4% (UESD 2013)	50%
Antenatal care coverage (at least 4 visits)	25% (UESD 2013)	50%

Source: HPNSDP 2011-2016, Mid-term Program Implementation Report (MPIR) July 2011-June 2014

The following indicators of investment for BSc nursing colleges are set, considering the collaboration with the technical cooperation project.

Quantitative indicator: Completion rate of seven BSc nursing colleges is increased because of the reduction of dropout rate by;

- Improvement of education environment by extension of academic building and provision of equipment for skill laboratory, and
- Improvement of supportive education environment especially for students from rural areas by new construction of student's hostel building

Qualitative indicator: Quality of nursing education is improved by new construction of students' hostel building and provision of equipment for skill laboratory in seven BSc nursing colleges

(2) Indicators for sub-projects beyond HPNSDP 2011-2016 (Strengthening the Imaging Diagnostic System)

1) Pre-condition for estimation of numbers of imaging diagnostic examinations

The maximum number of tests per year by equipment can be estimated using the time required for one test as shown in Table 8-12. Column A shows the quantity of equipment to be procured for seven MCHs in total by the Project. Column B, active equipment, refers to the amount of equipment that can be used in a day. Gastrosopes and colonoscopes are used alternately because they must be disinfected after each use. The time required for one test varies by the equipment, as shown in column C. Generally, MCHs are open for six hours (360 minutes) per day, from 8:00 to 14:00 for 250 days per year. The maximum number of tests per year can be calculated in column E. The amount of active equipment multiplied by the maximum number of tests per year equals the total maximum number of tests per year. The target numbers of tests are calculated as the accumulated number of tests after two years from completion of the project.

Table 8-12: Maximum Number of Tests per Year by Equipment Invested in the Sub-projects beyond HPNSDP2011-2016

Equipment	A	B	C	D	E	F
	New installment Quantity	Active equipment	Test time (min)	Max. No. of tests/day*	Max. No. of tests/yr**	Total max. No. of tests/yr***
CT	7	7	45	8	2,000	14,000
MRI	6	6	60	6	1,500	9,000
Conventional radiography	10	10	30	12	3,000	30,000
Mammography	5	5	60	6	1,500	7,500
Angiograph	4	4	120	3	750	3,000
Ultrasound examination 4D	16	16	40	9	2,250	36,000
Ultrasound examination 2D	24	24	30	12	3,000	72,000
Gastroscope	16	8	60	6	1,500	12,000
Colonoscope	14	7	90	4	1,000	7,000

\*Hospital open hours 8:00-14:00 (360 minutes)

\*\*250 working days/year \*\*\*F=BxE

## 2) Indicators for sub-projects beyond HPNSDP 2011-2016

The indicators for sub-projects beyond HPNSDP 2011-2016 are categorized as quantitative or qualitative. The proposed quantitative and qualitative indicators with targets and sources are shown in Table 8-13. The target numbers of examinations by imaging diagnostic equipment are calculated based on the maximum numbers of tests in Table 8-12.

Table 8-13: Indicators for Sub-projects beyond HPNSDP 2011-2016

Indicators	Original (Year 2014)	Target (Year 2022 )	Source
<b>1. Quantitative Indicator</b>			
Number of examinations by each imaging diagnostic equipment and endoscopy (new installed equipment and total of both existing and newly installed equipment)	New:0  Existing: CT:6,840(7) MRI:28,341(6) GX-ray:312,523(17) Mammography: 471(3) Angiograph:2,881(6) Ultrasound:111,956(23) Gastroscope: 12,824(10) Colonoscope:1,366(7)  *(No.) means total number of functional equipment in 7 MCHs in 2014 (See Table 7-24).	New: CT:21,470 MRI:9,667 D. GX-ray:51,179 Mammography:2,413 Angiograph:4,032 US4D:41,931 US2D:83,383 Gastroscope: 16,143 Colonoscope: 4,364  Existing: CT:1,798 MRI:477 D. GX-ray:11,135 Mammography: 290 Angiograph: 594 US: 38,528 Gastroscope: 0 Colonoscope: 0	New: Hospital Statistics (PACS/RIS record)  Existing: Hospital Statistics (Register of patients examined at departments)
Radiation exposure level at waiting rooms in the imaging diagnostic center		Maintain stable under the safe level	Monitoring records of regular check with Geiger counter
Radiation exposure level of radiologists/ radiographers working in the imaging diagnostic center		Maintain stable under the safe level	Monitoring records of personal dosimeter
<b>2. Qualitative Indicator</b>			
Patients' satisfaction of the medical services provided in the imaging diagnostic center (Through efficient operation of imaging diagnostic center, speedy examinations and diagnosis, safety management in radiation exposure, etc.)		Increased	Interview with patients
Medical workers' motivation in working at imaging diagnostic center. (Through participation of conference and training, safety management in		Increased	Interview with medical doctors

radiation exposure, etc.)			
Evidence-based medicine by utilizing the results of imaging diagnostic examinations		Enhanced	Interview with medical doctors
Clinical research by utilizing the results of imaging diagnostic examinations		Advanced	Annual reports of MCHs

### 3) Adjustment of expected numbers of examinations by MCH

The maximum numbers of examinations are the estimated physical limit values of each type of equipment, calculated using the time required for testing and the proper frequency of use. However, the numbers of examinations in real terms might vary by MCH because of various factors. Thus, it is necessary to adjust the expected numbers of examinations by MCH.

The Survey Team analyzed the correlations between the variation in the number of examinations and the factors and ultimately found that the most significant factor was the number of outpatients. Generally, patients are examined after consultation at out-patient departments.

The numbers of outpatients by MCH in 2013 are shown in Table 8-14. Since the number of outpatients in the Sylhet MCH was the highest among the seven MCHs, the adjustment factor of the Sylhet MCH is set to 1.

Table 8-14: Adjustment Factors for Number of Outpatients by MCH

MCHs	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal
No. of Outpatients (2013)	634,655	527,130	197,861	560,628	746,990	237,733	354,069
Factor by No. of OPD (Sylhet =1)	0.8	0.7	0.3	0.8	1.0	0.3	0.5

The expected number of examinations by MCH is adjusted using the adjustment factors (Table 8-14). Because the Sylhet MCH adjustment factor was the standard value (at 1.0), the expected number of examinations in the Sylhet MCH was the same as the physical limit value of the equipment. However, currently, the numbers of examinations involving mammography in MCHs are quite low due to a lack of female radiologists and radiology technologists. Therefore, the expected number is set as 420 using the current number of examinations involving mammography in Sylhet for standardization.

The minimum number of examinations is set at half of expected number of examinations.

The maximum, expected, and minimum numbers of examinations for two Bangladesh fiscal years (2020-2022) by MCH are calculated based on the pre-conditions above and amount of equipment newly installed by the sub-projects as shown in Table 8-15.



Table 8-15: Indicators for New Equipment to be Installed by MCH

Equipment	Dhaka			Chittagong			Khulna		
Indicators	Max	Expected	Min	Max	Expected	Min	Max	Expected	Min
CT (128 slice)	4,000	3,398	1,699	4,000	2,823	1,411	4,000	1,060	530
MRI (1.5 T)	3,000	2,549	1,274	3,000	2,117	1,059	3,000	795	397
Digital G-Xray	6,000	5,098	2,549	6,000	4,234	2,117	12,000	3,179	1,589
Mammography	N/A <sup>4</sup>	N/A	N/A	3,000	593	296	N/A	N/A	N/A
Angiograph	1,500	1,274	637	1,500	1,059	529	1,500	397	199
Ultrasound 4D	13,500	11,470	5,735	9,000	6,351	3,176	9,000	2,384	1,192
Ultrasound 2D	24,000	20,391	10,195	24,000	16,936	8,468	12,000	3,179	1,589
Gastroscope	6,000	5,098	2,549	3,000	2,117	1,059	3,000	795	397
Colonoscopy	2,000	1,699	850	2,000	1,411	706	2,000	530	265

Continued

Equipment	Rajshahi			Sylhet			Rangpur		
Indicators	Max	Expected	Min	Max	Expected	Min	Max	Expected	Min
CT (128 slice)	4,000	1,501	751	4,000	4,000	2,000	4,000	1,237	637
MRI (1.5 T)	3,000	1,126	563	3,000	3,000	1,500	N/A	N/A	N/A
Digital G-Xray	12,000	4,503	2,252	12,000	12,000	6,000	N/A	N/A	N/A
Mammography	3,000	315	158	3,000	840	420	3,000	267	134
Angiograph	1,500	563	281	N/A	N/A	N/A	N/A	N/A	N/A
Ultrasound 4D	9,000	3,377	1,689	9,000	9,000	4,500	9,000	2,864	1,432
Ultrasound 2D	18,000	6,755	3,377	18,000	18,000	9,000	24,000	7,638	3,819
Gastroscope	3,000	2,252	1,126	3,000	3,000	1,500	3,000	955	477
Colonoscopy	2,000	1,501	751	2,000	2,000	1,000	2,000	637	318

Continued

Equipment	Barisal			Total		
Indicators	Max	Expected	Min	Max	Expected	Min
CT (128 slice)	4,000	1,896	948	26,000	15,314	7,657
MRI (1.5 T)	3,000	1,422	711	18,000	11,008	5,504
Digital G-Xray	12,000	5,688	2,844	60,000	34,701	17,351
Mammography	3,000	398	199	13,500	2,280	1,140
Angiograph	N/A	N/A	N/A	6,000	3,293	1,647
Ultrasound 4D	13,500	6,399	3,199	67,500	40,413	20,207
Ultrasound 2D	24,000	11,376	5,688	132,000	80,455	40,228
Gastroscope	3,000	1,422	711	22,500	15,160	7,580
Colonoscopy	2,000	948	474	13,000	8,408	4,204

The target numbers of examinations by hospital are adjusted in accordance with the following procedure, utilizing the numbers of examinations per equipment in each hospital in Table 8-16 calculated by the figures, the number of examinations in Table 7-24 and the inventory in 7-25, in each hospital.

<sup>4</sup> N/A: No plan of installation of the equipment

Table 8-16: Comparison between Maximum Number (physical limit value) and Current Numbers of Examinations per Equipment in Each Hospital

Equipment	Max.	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal
CT	2,000	7,500	1,605	4,087	0	4,964	5,592	1,258
MRI	1,500	2,616	720	0	1,526	692	945	0
G-Xray	3,000	36,750	48,921	2,877	41,370	23,257	18,099	37,000
Mammography	1,500	41	0	10	0	420	0	0
Angiograph	750	604	697	0	792	488	300	0
Ultrasound	5,250	7,300	2,296	564	5,586	7,012	3,654	0
Gastroscope	1,500	1,717	1,056	497	919	3,152	824	1,200
Colonoscope	1,000	259	192	0	15	396	152	200

\* Gray highlighted cells: the number is equal or over the maximum number of examination

\*\* Bold letters: the number is less than half of the maximum number of examination

Source: Prepared by the Survey Team

The definition of setting the target numbers is;

- If number of examinations per equipment is equal or over the maximum number (physical limit value), the maximum number in Table 8-15 is applied.
- If number of examinations per equipment is less than half of the maximum number and nil, the minimum number in Table 8-15 is applied.
- If number of examinations per equipment is more than half of the maximum number and less than maximum number, the expected number in Table 8-15 is applied.
- Number of examination of mammography is already adjusted as mentioned above.

As a result, the target numbers are adjusted as shown in Table 8-17.

Table 8-17: Adjusted Target Numbers of Examinations by Equipment to be Newly Installed for 2020-2022 (2 years)

Equipment	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	Total
CT (128 slice)	4,000	2,823	4,000	751	4,000	4,000	1,896	21,470
MRI (1.5 T)	3,000	1,059	397	3,000	1,500	N/A	711	9,667
Digital G-Xray	6,000	6,000	3,179	12,000	12,000	N/A	12,000	51,179
Mammography	N/A	593	N/A	315	840	267	398	2,413
Angiograph	1,274	1,059	199	1,500	N/A	N/A	N/A	4,032
Ultrasound 4D	13,500	3,176	1,192	9,000	9,000	2,864	3,199	41,931
Ultrasound 2D	24,000	8,468	1,589	18,000	18,000	7,638	5,688	83,383
Gastroscope	6,000	2,117	397	2,252	3,000	955	1,422	16,143
Colonoscope	850	706	265	751	1,000	318	474	4,364

\*The total numbers of examinations by each equipment are the target numbers of examinations by new equipment on Table 8-13.

#### 4) Setting evaluation standards for the number of examinations

The maximum number of examinations is the physical limit values of a given type of equipment as is described at line E of Table 8-12. The maximum numbers of examinations for two years of

2020-2022 by new installed equipment in each hospital are shown in Table 8-15. If the actual number of examinations exceeds that limit value, then most likely the equipment is overused. The possible reasons for overuse are insufficient number of equipment in comparison with number of patients and too many emergency cases.

The minimum number of examinations can be used to evaluate whether the equipment is underused. The minimum numbers of examinations of each type of equipment should be adjusted by hospital alike the target numbers of examinations to evaluate the actual situation fairly. The adjusted minimum requirement by equipment in each hospital to verify underuse is set as follows. If the actual number of examinations are lower than minimum requirement, then most likely the equipment is underused. The possible reasons for underuse are lack of human resources, long-term breakdown and other operational matters such as lack of utility cost.

- i) If the target number of examinations is used maximum or expected number of examinations in Table 8-15, half of the minimum number is set as minimum requirement
- ii) If the target number of examinations is used minimum number of examinations in Table 8-15, quarter of the target number is set as minimum requirement. Because case i) uses the quarter of target numbers.

The adjusted minimum requirement is shown in Table 8-18.

Table 8-18: Adjusted Minimum Requirement of Number of Examinations by New Installed Equipment in 2020-2022 (2 years)

Equipment	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal
CT (128 slice)	850	706	265	188	1,000	318	474
MRI (1.5 T)	637	265	199	281	375	0	178
Digital G-Xray	1,274	1,059	795	1,126	3,000	0	1,422
Mammography	0	148	0	79	210	67	100
Angiograph	319	265	50	141	0	0	0
Ultrasound 4D	2,867	794	298	844	2,250	716	1,600
Ultrasound 2D	5,098	2,117	397	1,689	4,500	1,910	2,844
Gastroscope	1,274	529	99	563	750	239	355
Colonoscope	213	177	66	188	250	80	119

#### 5) Number of examinations using unexpired equipment in 2020-2022

The estimated amount of equipment in MCHs that will have not expired by 2022 is shown in Table 8-19. It was estimated using the manufacturing year. It assumed that CT, MRI, general X-ray, mammography, angiography and ultrasound machines expire after 10 years and endoscopes after 5 years. Thus, most existing equipment will have expired by 2020.

Table 8-19: Expected Amount of Unexpired Equipment in 2020-2022

Equipment	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	Total
CT	0.5	0	0	0	0	0	1	1.5
MRI	0	0	0	0	0	1	0	1
G-Xray	1	2	0.5	0	1	1	0	5.5
Mammography	0.5	0	1	0	0	0	0	1.5
Angiograph	0	0	0	0	0	1	1	2
Ultrasound	3	1	1	2	2	1	0	10
Gastroscope	0	0	0	0	0	0	0	0
Colonoscope	0	0	0	0	0	0	0	0

\* If one piece of equipment is 10 years old in 2021, the value of piece of equipment is 0.5, because it can be used for only one year during 2020-2022.

Expected numbers of examinations using the unexpired equipment for two years (Bangladesh fiscal years 2020-2022) by MCH were calculated using the minimum number of examinations in Table 8-15, because frequent breakdown and/or prolonged examination time of equipment may occur with age. The expected numbers of examinations of unexpired equipment are shown in Table 8-20.

Table 8-20: Expected Number of Examinations Using Unexpired Equipment in 2020-2022

Indicators	Expected No. of examination							
	Dhaka	Chittagong	Khulna	Rajshahi	Sylhet	Rangpur	Barisal	Total
CT	850	0	0	0	0	0	948	1,798
MRI	0	0	0	0	0	477	0	477
G-Xray	2,549	4,234	397	0	3,000	955	0	11,135
Mammography*	178	0	111	0	0	0	0	290
Angiograph	0	0	0	0	0	239	355	594
Ultrasound	13,381	3,705	1,391	7,880	10,500	1,671	0	38,528
Gastroscope	0	0	0	0	0	0	0	0
Colonoscope	0	0	0	0	0	0	0	0

### 8.3.2 Financial and Economic Evaluation

The Survey Team attempted Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) analysis of the sub-project beyond HPNSDP 2011–2016 (Component-2). The net benefit and FIRR of the Component 2 will be negative. If the target hospitals increase examination fee, the indicators will be favorable return. However, it is impossible because the target hospitals have the mandate to provide their medical services for all the people, especially for who cannot afford to go to private hospital.

The Component-2 is expected to produce positive economic benefits in collaboration with other factors. Especially, the people living in remote area can increase accessibility to the examination with lesser cost. Also the improved imaging diagnostic equipment can accelerate the early

detection capacity of the target MCHs, and it leads to controlling the lost profit (opportunity cost) occurred by aggravating the diseases to the serious condition. However, it is difficult to evaluate the investment in terms of economic internal return rate because of limited numeral data and information.



**CHAPTER 9:**  
**Environmental and**  
**Social Considerations**





## CHAPTER 9: Environmental and Social Considerations

### 9.1 Baseline Environmental and Social Conditions

Bangladesh, officially known as the People's Republic of Bangladesh, achieved independence from Pakistan in 1971. It is bordered by India to the west, north and north-west, and by Myanmar to the south-east. An Outline of Natural Environment, Social Environment and Pollution are as the following tables:

#### (1) Natural environment

Table 9-1: Baseline of Natural Environment

Item	Description												
Location and Topology	Bangladesh is dominated by one of the largest deltas in the world formed by the confluence of three Himalayan rivers: the Ganges (the Padma in Bengali), the Brahmaputra (the Jamuna in Bengali) and the Meghna; with a long coastline along the Bay of Bengal. Floodplains (80%), terraces (8%) and hills (12%) cover the land area. The hill zone is relatively small and mainly located in the southeast (Chittagong Hill tracts, the highest point of 1,230 m is at Mt. Keokradong) and in the northeast (Sylhet division). With plenty of water resources and fertile soil, the majority of the land is sufficiently fertile for rice-paddy cultivation.												
Climate	The 3 seasons are distinct: a mild winter (November to February), a hot, humid summer (March to June) and a humid, warm monsoon with heavy rainfall (June to October). Bangladesh is at its coldest from late December to early January, with average temperatures dipping as low as 4–7 °C. The temperature then increases until April, and the temperature at this time ranges from 27–30 °C in most parts of the country, except for areas such as the Rajshahi District where the maximum temperature can rise up to 40 °C or more. The annual average temperature of Dhaka is 25 °C and the monthly temperature varies from 18 °C in January and 29 °C in August. Approximately 80% of the annual average rainfall of 1,854 mm occurs between May and September. Chittagong has a completely tropical monsoon climate with hot, wet summers and dry, cool winters. The maximum temperatures are between 29 °C and 35 °C, and the minimum temperatures are between 12 °C and 17 °C. Generally, the total annual rainfall throughout the city is between 2,059 mm and 3,048 mm.												
Protected Area	There are several different types of protected areas in Bangladesh. Three types of protected area were defined under the Wildlife (Preservation) Act of 1973 (amended 1974) with the objective of conserving biodiversity (in situ) and the natural environment of various forest types.												
	<table><tr><th>Type of Area</th><th>Site</th><th>Description</th></tr><tr><td>National Park</td><td>10</td><td>A comparatively large area of natural beauty to which members of the public have access for recreation, education and research and in which the wildlife is protected.</td></tr><tr><td>Wildlife Sanctuary</td><td>7</td><td>An area maintained as an undisturbed breeding ground for wild fauna and where the habitat is protected for the continued well-being of the resident or migratory fauna.</td></tr><tr><td>Game Reserve</td><td>1</td><td>Normally comprised of a relatively isolated area set aside for protecting wildlife in general and for increasing the population of particular species.</td></tr></table>	Type of Area	Site	Description	National Park	10	A comparatively large area of natural beauty to which members of the public have access for recreation, education and research and in which the wildlife is protected.	Wildlife Sanctuary	7	An area maintained as an undisturbed breeding ground for wild fauna and where the habitat is protected for the continued well-being of the resident or migratory fauna.	Game Reserve	1	Normally comprised of a relatively isolated area set aside for protecting wildlife in general and for increasing the population of particular species.
	Type of Area	Site	Description										
	National Park	10	A comparatively large area of natural beauty to which members of the public have access for recreation, education and research and in which the wildlife is protected.										
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Game Reserve	1	Normally comprised of a relatively isolated area set aside for protecting wildlife in general and for increasing the population of particular species.											
Wildlife and Forest	(Wildlife) It is very likely that the total number of angiosperm species may reach approximately 5,000. Although endemism is relatively low in the country, the records suggest the existence of at least 16 endemic species of flowering plants. A total of 653 fish species and a total of 650 bird species have been reliably recorded in the country. The mammalian species diversity is represented by 121 species of mammals, many of which are now endangered.												
	(Forest) The total forest area in 2010 was estimated at about 14,420 km <sup>2</sup> , which is 11% of the land, excluding the inland water areas. However, these figures have been on the decline.												

Source: Profile on Environmental and Social Consideration in Bangladesh (2012)

## (2) Social environment

Table 9-2: Baseline of Social Environment

Item	Description
Population	In March 2011, the estimated population of Bangladesh was 142,319,000. The average rate of the annual population growth between 2001 and 2011 was 1.34%. Its population density (national average) was 964 people/km <sup>2</sup> .
Poverty	Bangladesh's per capita gross domestic product (GDP) in 2010 was \$642, classifying the country as one of the Least Developed Countries (LDC) as per the United Nations framework. However, with its 6.4% economic growth in 2010 and with its maintenance of a relatively high growth rate, Bangladesh's economic situation has become better compared to that of other LDCs.
Indigenous People	Bangladesh has been the dwelling place of different ethnic groups. Around 35 smaller groups of indigenous people covering about 2% of total population have been living in the hilly zone and some areas of the plain lands. The Chakma (the biggest group, population 252,858 by census 1991), Tripura, Marma and Murong live in eastern and southeastern area (Chittagong Division), Santal (second biggest group, population 202,162 by census) and Rajbangshi live in western part (Rangpur Division) of the country.
Cultural Heritage	In Bangladesh, the Antiquities Act (Amendment) stipulates that cultural properties located in 345 places are subject to protection by the nation. In addition, there are three places of Cultural and Natural Heritage that are registered in the UNESCO list as World Heritage Sites. Legislation pertaining to archaeological impact assessments (AIA) has not yet been developed. AIAs have been considered as necessary in addition to environmental impact assessments (EIAs), especially in development projects that have progressed in Bangladesh in recent years.

Source: Profile on Environmental and Social Consideration in Bangladesh (2012), EIA Draft Final Report for Preparatory Survey for Dhaka-Chittagong National Highway No.1 Bridge Construction and Rehabilitation Project (2012.9), Bangladesh News: <https://www.independent-bangladesh.com/ethnic-groups/>

## (3) Pollution

Table 9-3: Baseline of Pollution

Item	Description
Air pollution	There are two major sources of air pollution; vehicular emissions and industrial emissions, and these are mainly concentrated in the cities. Additionally, there are numerous brick-making kilns that use coal and wood as sources of energy, resulting in the emission of PM, SOX and volatile organic compounds. In addition to these usual sources of fuel, spent or used rubber wheels of vehicles are also burnt, emitting black carbon and toxic gases. These practices are hazardous to human health.
Water pollution	Industrialization and urbanization started rapidly, under circumstances defined by the insufficiency of environmental laws and their deficient implementation, and by obsolete pollution control technology. These factors led to pollution, such as the discharge of untreated wastewater from factories and domestic wastewater from residences, rural water containing chemical fertilizer and pesticides, and ocean and river water polluted with oil discharges from ships in ports.
Solid Waste	Especially in Dhaka, the waste management problem is increasingly serious. Dhaka faces many problems, including a low trash collection rate in relation to the amount of waste generated and the difficulty of securing final disposal sites. In details of the sources of solid waste, households account for nearly half of the waste generated in the city while markets or commercial centers contribute one fifth, industrial waste accounts for about 24% and hospitals and clinic contribute about 7%.
Noise and Vibration	To prevent noise pollution, the Government of Bangladesh enacted Noise Pollution (Control) Rules in 2006. However, the actual situation has not been improved, as the data collected by several different researches suggests. According to the results of a noise test that was conducted near hospitals in Dhaka city, noise levels between 69-82dB were recorded that are over the Bangladesh and World Bank guidelines (in case of silent area: 40-50dB)

Source: Profile on Environmental and Social Consideration in Bangladesh (2012)

#### (4) Confirmation of sensitive area related target site

By the JICA Guidelines for Environmental and Social Considerations (2010), sensitive areas that are categorized as “A” are as the following definition;

- Projects in the following areas or their vicinity: National parks, nationally-designated protected areas (coastal areas, wetlands, areas for ethnic minorities or indigenous peoples and cultural heritage, etc. designated by national governments)
- Areas that are thought to require careful consideration by the country or locality

##### Natural Environment

- Primary forests or natural forests in tropical areas
- Habitats with important ecological value (coral reefs, mangrove wetlands, tidal etc.)
- Habitats of rare species that require protection under domestic legislation, international treaties etc.
- Areas in danger of large-scale salt accumulation or soil erosion
- Areas with a remarkable tendency towards desertification

##### Social Environment

- Areas with unique archeological, historical, or cultural value
- Areas inhabited by ethnic minorities, indigenous peoples, or nomadic peoples with traditional ways of life, and other areas with special social value

All target sites of this study are considering the location within each MCH and Nursing College (NC), not inside the above sensitive areas. However, a hospital itself is a kind of sensitive area that is necessary to take care with, especially during construction.

Table 9-4: Consideration of Sensitive Area

Target Site (Including NC)	Division	Sensitive area based on JICA Guidelines		
		National parks, Nationally-protected area	Area that requires careful consideration	
			Natural Environment	Social Environment
Chittagong MCH	Chittagong	The Mangrove forest area and the habitat of wildlife named the Sundarbans National Park designated UNESCO World Heritage is located in Khulna Division. But Khulna MCH is not located in that protected area.	The Mangrove forest area and the habitat of wildlife named the Sundarbans National Park designated UNESCO World Heritage is located in Khulna Division. But Khulna MCH is not located in that protected area.	There are 2 UNESCO World Heritage sites in Bangladesh (Khulna Division and Rajshahi Division). But Khulna MCH and Rajshahi MCH are not located in that area. There are some indigenous people at Chittagong Division. But adverse impact by this project is not expected.
Dhaka MCH	Dhaka			
Mymensingh NC				
Rajshahi MCH	Rajshahi			
Rangpur MCH	Rangpur			
Sylhet MCH	Sylhet			
Barisal MCH	Barisal			
Khulna MCH	Khulna			

Note: MCH (Medical College Hospital), NC (Nursing College)

Source: The Survey Team









<p>Dhaka MCH</p> 	<p>Chittagong MCH</p> 
<p>Sylhet MCH</p> 	<p>Barisal MCH</p> 
<p>Rangpur MCH</p> 	<p>Rajshahi MCH</p> 
<p>Khulna MCH</p> 	<p>Mymensingh NC</p> 

Figure 9-1 Picture of 8 Target Site (7 MCH and 1 NC)

## 9.2 Environmental Administration

Regulatory requirements toward protection and conservation of environment and various environmental resources and also toward protection of social environment from adverse impact of projects and activities associated with them have been enunciated by the Government of Bangladesh as well as financiers. Pertinent requirements among these are summarized as follows.

### 9.2.1 Environmental Laws, Policies and Guidelines<sup>1</sup>

#### (1) National environmental policy, 1992

Bangladesh adopted a national environmental policy in 1992 aimed at sustainable development. The policy sets out the basic framework for environmental action together with a set of broad sectoral guidelines for action. Key elements of the policy are:

- Maintaining ecological balance and ensuring sustainable development of the country through protection and conservation of the environment;
- Protecting the country from natural disasters;
- Identifying and regulating all activities that pollute and destroy the environment;
- Ensuring environment-friendly development in all sectors;
- Ensuring sustainable and environmentally sound management of the natural resources;
- Maintaining active association, as far as possible, with all international initiatives related to environment.

With regard to the health sector the environmental policy aims at prevention of harmful activities in the country on Chapter 3.3 in this policy.

#### (2) Environment Conservation Act (ECA), 1995

This Act authorizes the Department of Environment (DOE) to undertake any activity to conserve and enhance the quality of environment and to control, prevent and mitigate pollution. The department is the regulatory body and enforcement agency of all environmental related activities. The act includes amongst others provisions that address the following main issues:

- Declaration of Ecologically Critical Areas;
- Procedure for obtaining Environmental Clearance Certificates;
- Regulation with respect to vehicles emitting smoke harmful for the environment;
- Environmental regulations for development activities;
- Standards for quality of air, water, noise, and soils for different areas and for different purposes;
- Acceptable limits for discharging and emitting waste;

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<sup>1</sup> Source: EIA Draft Final Report for Preparatory Survey for Dhaka-Chittagong National Highway No.1 Bridge Construction and Rehabilitation Project (2012.9)

- Formulation of environmental guidelines to control and mitigate environmental pollution, conservation and improvement of environment.

### (3) Environment Conservation Rules (ECR), 1997

The Environment Conservation Rules provide a first set of rules under the Environment Conservation Act, 1995. These provide amongst others standards and guidelines for:

- Categorization of industries and development projects, including roads and bridges on the basis of actual and anticipated pollution load;
- Requirement for undertaking Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA), as well as formulating an Environmental Management Plan (EMP) according to categories of industries/development projects/activities;
- Procedure for obtaining environmental clearance;
- Environmental quality standards for air, surface water, groundwater, drinking water, industrial effluents, emissions, noise and vehicular exhausts;
- Projects / activities are classified into four categories: Green, Orange A, Orange B and Red based on its location and impact on environment,

“Clinic” is classified as Orange-B in No.25, “Hotels, multi-story commercial and apartment buildings” are also classified as Orange-B in No.8. And “Hospitals” are classified as Red in No.51.

### (4) EIA guidelines for industry, 1997

These guidelines have been prepared by DOE on the basis of the work done by various types of industry projects as well as on the requirements of the Environment Conservation Rules (1997). Owing to this, these guidelines specifically cover industry projects and show how the EIA for industry projects in Bangladesh should be implemented. The brief composition is:

- Introduction to EIA in Bangladesh
- Criteria for locating industrial plants
- Steps involved in conducting IEE
- Steps involved in conducting EIA
- Review of an EIA report

All requisite clearance from the DOE shall be obtained prior to commencement of civil work. The Ministry of Health, Family and Welfare (MOHFW) will proceed with the application for clearance in due course.

## (5) Other relevant legislations

Table 9-5: Relevant Acts

Act/Law/Ordinance	Brief Description	Responsible Agency
Environment Court Act, 2000 and subsequent amendments in 2002	Describes environment related legal proceedings	Ministry of Environment and Forests (MOEF)
Water Supply and Sanitation Act, 1996	Regulate the management and control of water supply and sanitation in urban areas	Ministry of Local Government, Rural Development and Cooperatives
The Forest Act, 1927 and subsequent amendments in 1982 and 1989	Regulates the protection of forests reserves, protected forests and village forests	Ministry of Environment and Forests (MOEF)
Bangladesh Wild Life (Preservation) Act, 1974	Describes the preservation of wildlife sanctuaries, parks, reserves	Ministry of Environment and Forests (MOEF)
The Protection and Conservation of Fish Act 1950 and subsequent amendments in 1982	Deals with the protection/conservation of fish in Government owned water bodies	Department of Fishery
The Land Acquisition Act, 1894 and The Acquisition and Requisition of Immovable Property Ordinance 1982 and subsequent amendments in 1994, 1995 and 2004	Describes procedures and provides guidelines to acquisition and requisition of land	Ministry of Land

Source: EIA Draft Final Report for Preparatory Survey for Dhaka-Chittagong National Highway No.1 Bridge Construction and Rehabilitation Project (2012.9)

## 9.2.2 IEE/EIA Procedure and Environmental Clearance Certificate<sup>2</sup>

### (1) Environmental Category and Requirement

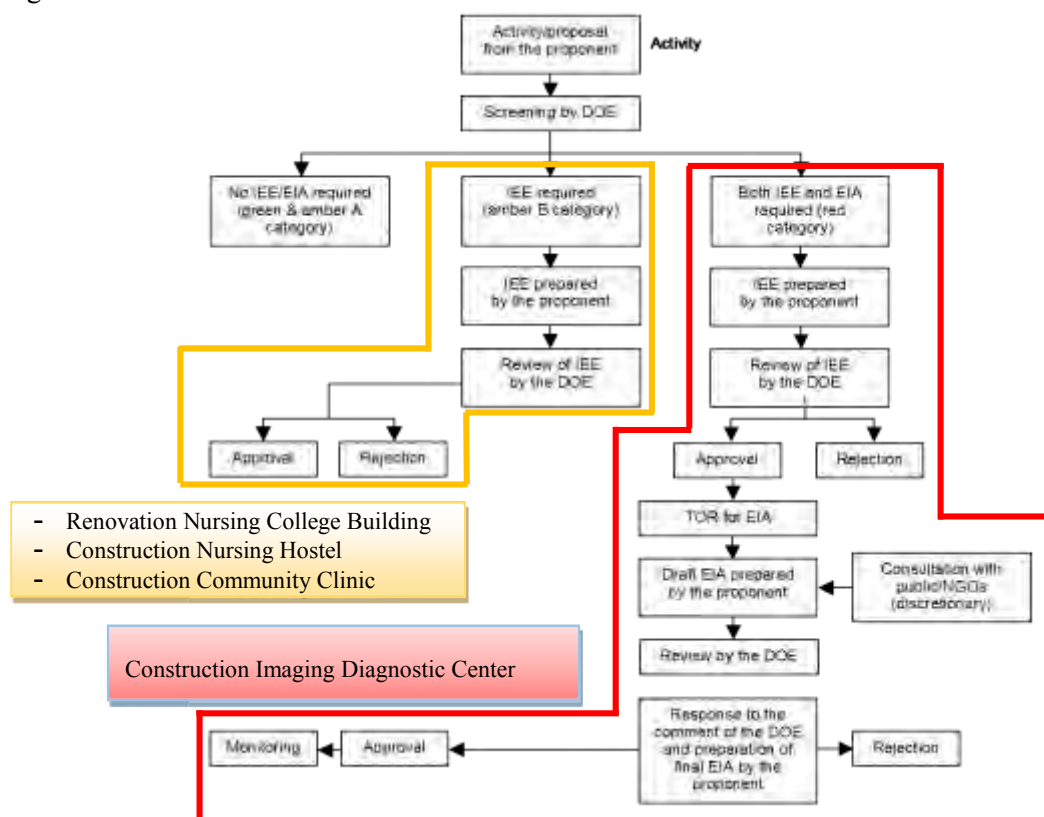
In Bangladesh, environmental assessment is conducted as part of the process of issuing Environmental Clearance Certificates (ECC). Industrial projects are divided into four categories, namely, Green, Orange-A, Orange-B and Red, according to their environmental significance and the location of the proposed development. Category Green projects do not require either IEE or EIA. Red Category projects, by contrast, require both IEE and EIA. This normative screening process enables the DOE and the proposers to determine which steps to follow in acquiring ECC. Special emphasis is placed on site selection for industries with a significant potential for environmental impacts. Thus, the proposers are required to consider alternative sites, keeping in mind the criteria put forward by the DOE.

### (2) IEE/EIA Procedure

The ECC should be issued to all industries and projects when they fall into the categories that require the EIA process to be conducted during screening. The Green Category requires ECC only; there is no need to conduct EIA. Orange-A, Orange-B and Red Categories must, in general, acquire a site clearance certificate (SCC) before the ECC can be issued, unless the Director General of DOE specifies otherwise. The SCC is awarded if the Director General of DOE

<sup>2</sup> Profile on Environmental and Social Considerations in Bangladesh (2012)

considers issuing such a certificate appropriate. Flowchart of IEE/EIA procedure is as following figure:



Note: Amber A and B are equivalent to Orange A and Orange B respectively

Figure 9-2: Flowchart of IEE/EIA Procedure

### (3) Adoption for sub-projects

As described in Chapter 3, Construction or Renovation of Nursing Colleges and hostels are considered as “Sub-projects within HPNSDP”. Construction of Imaging Diagnostic Centers is considered as “Sub-projects beyond HPNSDP”. During the 2nd field survey, the Survey Team confirmed Category of both sub-projects to DOE. Summary of explanation and opinion by DOE are as following table:

Table 9-6: Category and Further Procedure

Item	Sub-project 1 within HPNSDP	Sub-project 2 beyond HPNSDP
Components	1. Renovation of Nursing College (NC) 2. Construction of Hostel for students of NC 3. Construction of Community Clinics (CCs)	Construction of Imaging Diagnostic Center
Location	At the premises of 7 NCs (Dhaka, Mymensingh, Chittagong, Barisal, Rajshahi, Rangpur, Sylhet)	At the premises of 7 MCHs (Dhaka, Chittagong, Barisal, Rajshahi, Rangpur, Sylhet, Khulna)
Structure	1. Extension additional 2 stories on existing NC building with 6 story foundations: 2. Hostel: 6 storied building with 8 story	Basement and 4 storied building with 7 story foundations, 840 m <sup>2</sup> /GF



Item	Sub-project 1 within HPNSDP	Sub-project 2 beyond HPNSDP
	foundations, 638m <sup>2</sup> /GF	
Category	<b>Orange-B</b>	<b>Red</b>
Explanation and Opinion by DOE	Similar classification of projects under ECA is <u>Multi-story apartment building</u>	Classification of projects under ECA is <u>Hospital</u> (because it is expected to generate medical and hazardous waste)
Adoption	Prepare IEE	Prepare both IEE and EIA
Further procedure	1. Preparation IEE and submission to DOE 2. Review by DOE 3. Issuance of ECC (it is necessary to obtain other certificate such as Site Clearance: SCC)	1. Preparation IEE with TOR for EIA 2. Submission IEE and TOR to DOE 3. Review by DOE 4. Issuance of ECC for IEE 5. Preparation EIA and submission to DOE 6. Review by DOE 7. Issuance of ECC (it is necessary to obtain other certificate such as SCC)

Source: The Survey Team

In case of the ‘Community Clinic (CC) Construction’ that is also the candidate of subproject, classification of category would be adopted as Category Orange-B because that project type would be ‘Clinic’ which has less than 10 beds according to the explanation by the DOE. It is necessary to prepare IEE for all proposed clinics the same as Sub-project 1 after deciding the detail project component (construction site, building design etc.). At present it is difficult to start IEE study because around 300 construction site for CC are not decided yet. According to discussion with DOE, many hospital buildings have been constructed without implementing of IEE/EIA and obtaining Environmental Certificate because of lack of experience and capacity of DOE up to now. Both sub-projects need to prepare IEE at first. In case of Sub-project 2, it is necessary to submit TOR for EIA when preparing IEE. Then EIA will be conducted after approval of IEE based on the regulation under ECA in Bangladesh.

IEE reports have been prepared each MCH and NC (one by one) up to end of August 2014 and submitted to DGHS (Directorate General Health Service) who is in charge of Environmental Management at MOHFW. Then DGHS has submitted IEE reports with TOR for EIA to MOHFW on September 2014. MOHFW has submitted them to DOE on January 2015.

IEE reports are expected to be approved in February 2015. The schedule for EIA submission is expected to be confirmed in May 2015. Acquisition of an EIA approval is expected in June 2015, whereas the release of Environmental Clearance Certificates will be expected in July 2015.

### 9.2.3 Related Agencies and Organizations

#### (1) Ministry of Environment and Forests (MOEF)<sup>3</sup>

From 1947 to 1962, the Provincial Forest Department was the authority with a Conservator of

<sup>3</sup> MOEF HP <http://www.moef.gov.bd/index.php>

Forests, and subsequently until 1971 by a Chief Conservator of Forests. With the formation of Bangladesh in 1971, reserved and proposed reserve forests passed to the Bangladesh Forest Department (BFD). From 1971 to 1989, BFD fell under the Ministry of Agriculture. During 1987-89, Forestry was a Division of Agriculture Ministry with a Secretary to Government in charge of the Forestry Division. The Department of Environment (DOE), established in 1977 under the Environment Pollution Control Ordinance, 1977, still functions under the ECA.

With the formation of the new MOEF, in 1989, both the departments were transferred to this new Ministry. The DOE has been placed under the MOEF as its technical wing and is statutorily responsible for the implementation of the Environment Conservation Act, 1995.

MOEF is the nodal agency in the administrative structure of the Central Government, for the planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programs. MOEF oversees all environmental matters in the country and is a permanent member of the Executive Committee of the National Economic Council.

## (2) Department of Environment (DOE)<sup>4</sup>

In 1977, the Environment Pollution Control Board with 16 members headed by a Member of the Planning Commission and Environment Pollution Control Cell headed by a Director with staff complement of 26 was established. This was followed in 1977 by the establishment of the Environment Pollution Control Project, in 1985 by the establishment of the Department Pollution Control and finally, in 1989 by the restructured and renamed Department of Environment, the activities of which are overseen by a Director General. The Department discharges its responsibilities through a head office and six Divisional offices located in Dhaka, Chittagong, Khulna, Bogra (Rajshahi), Barisal and Sylhet. Of late, the Government has set up 21 new offices at district level with the creation of 468 new positions. As a result, the DOE staff has been increased to 735.

DOE's vision is to ensure sustainable environmental governance for achieving high quality of life for the benefit of present and future generations. DOE's mission is to help secure a clean and healthy environment for the benefit of present and future generations; through the fair and consistent application of environmental rules and regulations, through guiding, training, and promoting awareness of environmental issues; and through sustainable action on critical environmental problems that demonstrate practical solutions, and that galvanize public support and involvement. Organogram of DOE is as the following figure;

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<sup>4</sup> DOE HP <http://www.doe.gov.bd/home/>

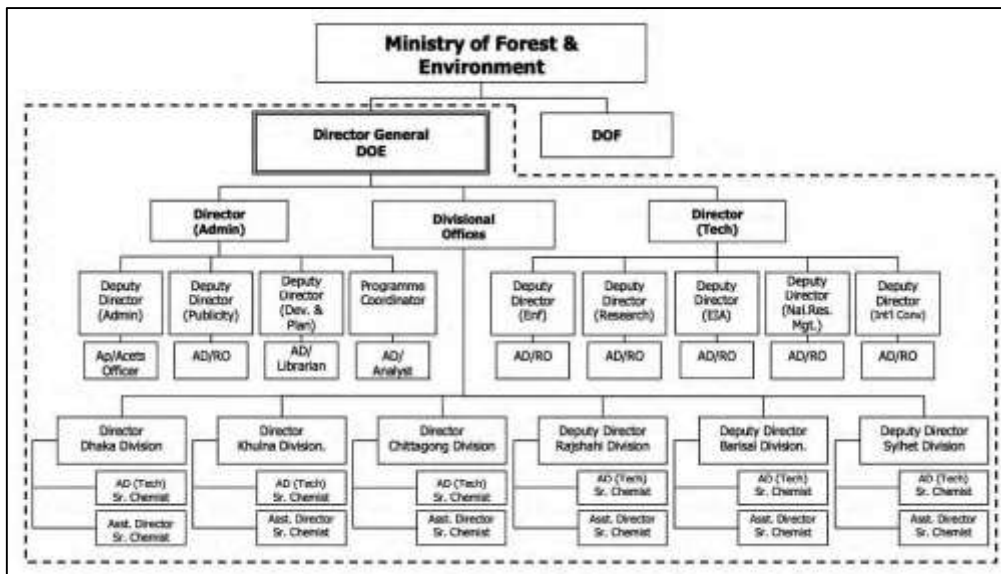


Figure 9-3: Organogram of DOE

Source: Profile on Environmental and Social Consideration in Bangladesh (2011)

#### 9.2.4 Existing Gaps of Bangladesh Laws and JICA Guidelines (2010)

There are no significant gaps in terms of the objectives of the EIA. Governmental legislation, however, pays scant attention to transparency, predictability and accountability. One of the reasons for this is that the EIA is conducted within the framework of the Environmental Clearance Certificate (ECC), which makes the EIA more acceptable than otherwise. The procedure of the EIA has recently been clarified, considerably narrowing the gaps between JICA's recommended procedure and that of Bangladesh. It is also important to note that domestic acts and ordinances pay little attention to social impacts and public participation. Major gaps between environmental regulations of Bangladesh and the JICA Guidelines are shown in the following table:

Table 9-7: Major Gaps between Environmental Regulations of GOB and the JICA Guidelines

Items	JICA Guidelines	Government of Bangladesh	Proposed measure
Environmental Policy and Regulations	JICA Guidelines for Environmental and Social Considerations, April 2004, WB OP4.01 Annex B	Environment Conservation Act (1995), Environment Conservation Rules (1977), EIA guidelines on Industrial projects	-
Category	Category A: it is likely to have significant adverse impact Category B: the potential adverse impact is less than A. Category C: it is likely to have minimal or little adverse impact Category FI*	4 Categories: Green, Orange-A, Orange-B, Red as the part of the process of issuing ECC	Considering the environmental procedure such as the requirement of IEE and EIA, the Survey Team follows the Bangladesh categories.
IEE and EIA Procedure	Category A: EIA required Category B: IEE required. If necessary, EIA will be	Green & Orange-A: No IEE and EIA required. Orange-B: IEE required	Follow the procedure described ECA & ECR

Items	JICA Guidelines	Government of Bangladesh	Proposed measure
	conducted.	Red: Both IEE & EIA required	
Contents of IEE report	Project Component/ Baseline environmental & social condition/ Legal frameworks/ Alternatives/ Scoping and TOR for EIA/ Environmental Impact/ Mitigation / Monitoring/ Stakeholders meeting	Introduction/ Description of the project/ the existing background environment around the site/ significant potential/ mitigation and abatement measure/ residual impact, if any/ monitoring program/conclusion	Contents of Both JICA Guidelines and ECA are similar. Alternatives and Stakeholders Meetings will be included for this survey.
Alternatives	Study of alternatives are required and also asked to consider cases that do not implement the project.	None stated in the ECA and ECR	Follow the JICA Guidelines
Information disclosure	JICA discloses EIA and environmental permit certificate when these documents are submitted by project proponent. (in case of Category B)	This process yet to be enacted. DOE makes the minutes of meetings on environmental clearance available on its website.	Follow the JICA Guidelines
Stakeholders Meeting/ Public participation	In the case of Category B projects, JICA encourages project proponents to consult with local stakeholders if necessary.	This process yet to be enacted. EIA guidelines state that a technical summary need not be prepared for the purpose of communication with public although Section 4.11 of the guidelines encourages public participation. No time frames are fixed for prior disclosure of EIA to the public.	Follow the JICA Guidelines

Note: Proposed projects are classified as Category FI if they satisfy conditions; JICA's funding of projects is provided to a financial intermediary or executing agency; the selection and appraisal of the sub-projects is substantially undertaken by such an institution only after JICA's approval of the funding, so that the sub-projects cannot be specified prior to JICA's approval of funding (or project appraisal); and those sub-projects are expected to have a potential impact on the environment.

### 9.3 Environmental Impact Evaluation (Imaging Diagnostic Center and Nursing College Building)

#### 9.3.1 Outline of Projects

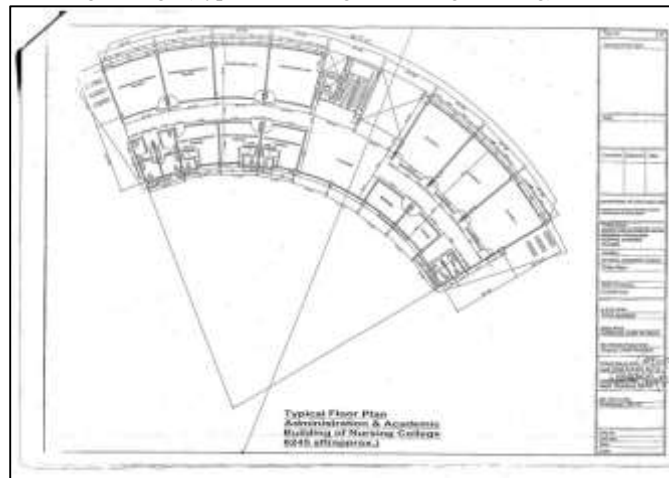
The outline of sub-projects and draft design is as following table;

Table 9-8: Project Components

Item	Sub-project 1	Sub-project 2
Scheme	Sub-project within HPNSDP	Sub-project beyond HPNSDP
Component	1. Renovation of Nursing College (NC) and 2. Construction of hostel for students of NC	Construction of Imaging Diagnostic Center
Description and Size (tentative)	1. Extension additional 2 stories on existing NC building: 6,245 square feet/ground floor 2. Hostel: 6 story building, around 600m <sup>2</sup> /ground floor	5 stories Floor area: 861m <sup>2</sup> /1 story

## Drawing of Sub-project 1: Renovation of NC and Construction of hostel for students of NC

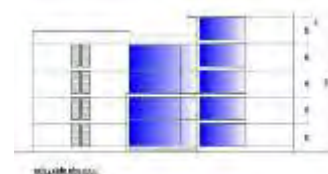
### Renovation of Nursing College (Typical Drawing of existing building)



### Construction of Hostel (Drawing of First (Ground) floor)



### Drawing of Sub-project 2: Construction of Imaging Diagnostic Center





Source: The Survey Team

### 9.3.2 Outline of the Site Condition (7MCH/1NC)

Outline of the site condition at seven MCHs and one NC is as following tables:



Table 9-9: Outline of the Site Condition (Barisal MCH and Dhaka MCH)

Item	Barisal MCH/NC	Dhaka MCH/NC
Division	Barisal	Dhaka
Component	Sub-project 1 & 2	Sub-project 1 & 2
Construction Site (tentative)	Hostel: close to the existing hostel Imaging Diagnostic Center: east side of existing hospital	Not decided yet
Pollution	Treatment of waste is not good. Drainage condition is also quite bad. Offensive odor is found everywhere in hospital.	Some departments control waste using different colored trash cans. Hospital side entrust NGO to collect waste.
Natural Environment	It is necessary to cut trees depending on the selection of construction site. There are many cows and goats inside the hospital. (It leads to inadequate sanitary situation.)	There are many big trees such as Mango, Neem at hospital.
Social Environment	There are 6-7 wells and 1 big water tank at the hospital. Garbage including excrement is littered everywhere at site.	There are many rickshaws and parking spaces near hostel. Sanitary condition of old nursing hostel is quite bad.
Photo	Drainage near Nursing College 	Waste Management 

Source: The Survey Team



Table 9-10: Outline of the Site Condition (Mymensingh NC and Chittagong MCH)

Item	Mymensingh NC	Chittagong MCH/NC
Division	Dhaka	Chittagong
Component	Sub-project 1	Sub-project 1 & 2
Construction Site (tentative)	Hostel: near existing hostel	Hostel: near existing hostel Imaging Diagnostic Center: not decided yet. (There is not enough space according to DG).
Pollution	Waste management is better than other nursing college.	Offensive odor is found everywhere. Waste management is quite bad. Noisy due to many rickshaws and cars at hospital.
Natural Environment	There are some mango trees at proposed construction site.	There are many trees such as teak and birds' nests (crows). Groundwater contains iron.
Social Environment	There are 2 wells near academic building and 1 big water tank.	Sanitary condition is not good. Shortage of toilets for visitors at hospital.

Item	Mymensingh NC	Chittagong MCH/NC
Photo	<p>Proposed construction site for Hostel</p> 	<p>In front of Nursing Hostel</p> 

Source: The Survey Team



Table 9-11: Outline of the Site Condition (Khulna MCH and Rajshahi MCH)

Item	Khulna MCH	Rajshahi MCH/NC
Division	Khulna	Rajshahi
Component	Sub-project 2	Sub-project 1 & 2
Construction Site (tentative)	Imaging Diagnostic Center: the right side of the entrance of Hospital	Hostel: under consideration Imaging Diagnostic Center: close to the Radiotherapy department, in front of laundry room
Pollution	Khulna city corporation collects waste and dispose of their waste at dumping site.	Hazardous and nonhazardous wastes are collected separately according to DG.
Natural Environment	There are 80 trees of 10 local species in front of main building.	There are a lot of various kinds of trees. Cutting is necessary for construction.
Social Environment	One deep tube well within the hospital compound supplies water throughout the campus through pipe network.	There are many wells and septic tanks. There is rickshaw parking space and crowd in front of emergency entrance.
Photo	<p>Proposed site for Imaging Diagnostic Center</p> 	<p>Proposed site for Imaging Diagnostic Center</p> 

Source: The Survey Team

Table 9-12: Outline of the Site Condition (Rangpur MCH and Sylhet MCH)

Item	Rangpur MCH/NC	Sylhet MCH/NC
Division	Rangpur	Sylhet
Component	Sub-project 1 & 2	Sub-project 1 & 2
Construction Site (tentative)	Hostel: Northeastern area at campus Imaging Diagnostic Center: a part of ground at northwestern area at campus. There are ICU at southern side.	Hostel: Southern part of campus Imaging Diagnostic Center: Southern side of hospital, near the main gate.
Pollution	Rangpur City Corporation collect waste and dispose of their waste at dumping site.	Hazardous and nonhazardous wastes are collected separately according to DG.
Natural Environment	Ground water can be found at low or shallow depth, aquifers contains iron.	There are some local species of bird such as crow etc. sheltering in the trees.

Item	Rangpur MCH/NC	Sylhet MCH/NC
Social Environment	Inadequate sanitation facilities coupled with lack of proper maintenance and unhygienic condition.	Inadequate sanitation facilities coupled with lack of proper maintenance.
Photo	Existing Nursing Hostel 	Proposed site for Nursing Hostel 

Source: The Survey Team

### 9.3.3 Alternatives Analysis (including without project)

Generally, there is a possibility that development process is expected to provoke an adverse impact on the environment. Environmental loads not only depend on the volume of fuel consumption, materials and solid waste, but also natural environment such as tree cutting especially during the construction.

On the other hand, if no project is implemented, the challenges that all MCHs and NCs are facing will not be overcome. In addition, it is likely that the condition of maternal and child health and the enhancement of medical health system in Bangladesh will not be improved if the project is not implemented.

The candidate designs for Sub-project 1 and Sub-project 2 are under preparation at present. Alternatives Analysis related each design is necessary to consider at further EIA stage in accordance with Environmental regulation in Bangladesh and the JICA Guidelines.

### 9.3.4 Scoping and Predicted Impact

The aim of scoping is to find out possible environmental and social impact caused by the implementation of proposed project. The results of scoping related to all project sites and survey method for confirmation of each impact are shown in following table:

Table 9-13: Results of Scoping (7 MCH and 1NC)

Item		Evaluation		Predicted Impact and (✓) Survey Method
		P/C	O	
1	Land acquisition and involuntary resettlement	D	D	Land acquisition and involuntary resettlement is not likely to occur, because target site is within MCH compound. ✓ Confirmation of proposed construction site and hearing (MCH, NC)
2	Local economy such as employment	C	D	Job opportunities will be increased during construction. ✓ Hearing (PWD, related agencies, consultants etc.)
3	Land use and utilization of local resources	C	D	Most of the project site consists of hospital and college buildings, open space and trees etc. It is expected that some trees would need to be cut down.



Item		Evaluation		Predicted Impact and (✓) Survey Method
		P/C	O	
				✓ Hearing and site survey, confirmation of satellite photos
4	Social institution: decision making groups	D	D	There is no decision making at hospitals. ✓ Hearing (MCH, NC etc.)
5	Social infrastructure and services	C	B+	It is expected that function of each hospital and life of the nursing college students will be improved after construction. ✓ Hearing (MCH, NC, NC students etc.)
6	Poor, indigenous people, ethnic group	C	B+	It is expected that access to medical service will be improved for vulnerable people too. ✓ Hearing (MOHFW, MCH, NC etc.)
7	Misdistribution of benefit and damage	D	D	No advance impact is expected. ✓ Hearing (MCH, NC etc.)
8	Cultural heritage	D	D	There is no cultural heritage at all MCHs and NC site. ✓ Confirmation of related documents (if necessary)
9	Local conflict of interest	D	D	No advance impact is expected. ✓ Hearing (MCH, NC etc.)
10	Usage of water and water right	B-	D	Usage of water in hospitals and hostels may become difficult during construction. ✓ Hearing and site survey
11	Accident	B-	D	Some traffic accidents are likely to be observed during the construction due to increase of cars and machines. ✓ Hearing (MCH, NC) and site survey
12	Sanitation	B-	B+	Because of increasing numbers of workers for construction, sanitary conditions at site will be worse. On the other hand, the situation will be improved by installation of new toilets at each MCH and NC during operation. ✓ Hearing and site survey (MOHFW, MCH, NC etc.)
13	Infectious disease, such as HIV/AIDS	C	B+	It is expected that enhancement of hospital will lead to improvement of access to medical service including the patients of HIV/AIDS ✓ Hearing (MOHFW, MCH, NC etc.)
14	Topography and geology	D	D	Large-scale geological alteration is not expected. So no adverse impact is foreseen. ✓ Confirmation of related information and site survey (if necessary)
15	Soil erosion	D	D	Construction of Imaging Diagnostic Center and hostels will not cause soil erosion. No adverse impact is expected. ✓ Confirmation of related information and site survey (if necessary)
16	Groundwater	D	D	It is not expected to pump up a large amount of groundwater. No adverse impact is expected. ✓ Site survey (Check the wells) and hearing (MCH, NC etc.)
17	Hydraulic situation	D	D	No adverse impact is expected. ✓ Confirmation of related information
18	Coastal zone	D	D	There is no coastal area at all MCHs and NC site. ✓ Confirmation of related information
19	Flora, fauna and biodiversity	B-	D	There are some/many valuable trees such as mango and neem and birds at MCHs and NC. It is expected cutting trees will be necessary to secure the land for construction. Some adverse impact is expected. ✓ Site survey (MCH, NC etc.), confirmation of related documents
20	Meteorology	D	D	No adverse impact is expected. ✓ Confirmation of related documents (if necessary)
21	Landscape	D	D	No adverse impact is expected. ✓ Confirmation of related documents (if necessary)

Item		Evaluation		Predicted Impact and (✓) Survey Method
		P/C	O	
22	Global warming	D	D	No adverse impact is expected. ✓ Confirmation of related documents (if necessary)
23	Air pollution	B-	D	Use of construction machinery and vehicles during the construction is likely to increase gas emission and dust. Some adverse impact is expected. ✓ Site survey and confirmation of related data (if necessary)
24	Water contamination	D	D	No adverse impact is expected. ✓ Site survey and confirmation of related data (if necessary)
25	Soil contamination	C	D	Oil spillage from construction machinery and vehicles is likely to occur during the construction. Some adverse impact is expected. Site survey and confirmation of related data (if necessary)
26	Waste	B-	C	Construction is likely to generate waste such as concrete, surplus soil and that from cutting trees. It is necessary to consider the treatment of general and hazardous waste by not only installation of incinerator but also establishment of waste management system at MCHs and NC. ✓ Hearing (MCH, NC), site survey and confirmation of related data.
27	Noise and vibration	B-	D	Use of construction machinery during the construction is likely to generate noise and vibration. ✓ Site survey and confirmation of related data (if necessary)
28	Ground subsidence	D	D	No adverse impact is expected. ✓ Confirmation of related information (if necessary)
29	Odor	B-	D	Use of machinery during the construction is likely to generate odor such as gas emission. ✓ Hearing (MCH, NC), Site survey and Confirmation of related data.
30	Bottom Sediment	D	D	No adverse impact is expected. ✓ Confirmation of related information (if necessary)

Source: The Survey Team

P/C: Planning and Construction phase, O: Operation Phase

A+/A-: Significant positive/negative impact is expected.

B+/B-: Positive/negative is expected to some extent

C: Extent of impact is unknown.

D: No impact is expected

### 9.3.5 Summary of Environmental Impact

This chapter describes the environmental impacts caused by the project both tentatively and during construction and permanently during operation. Study approaches employed, where applicable are; Existing data collection, Discussion with MCH/NC, DOE and MOHFW, Site reconnaissance. The summary of environmental impact related 7 MCHs and 1NC is as follows:

Table 9-14: Environmental Impact

Item		Description
1	Land acquisition and involuntary resettlement	There is no requirement of land acquisition, as proposed facilities under the project will be built on the existing land within the hospital compound. Hospital authority will provide the land required for the proposed facilities. Therefore there is no involuntary resettlement.
2	Local economy such as employment/ livelihood	It is expected that construction of proposal facilities will generate employment. Improvement in health service will contribute to the improvement in public health, which in turn will have positive impact on local economy and livelihood.
3	Land use and	Existing land use including hospital structures, open space, trees, internal roads etc.

Item		Description
	utilization of local resources	will be necessary to be obtained (but it may be difficult to secure the land for proposed facilities in case of Dhaka MCH/NC).
4	Social institution and local decision making institutions	There is no decision making group at MCHs and NC. It may increase the opportunity to access medical service for the people in Bangladesh.
5	Social infrastructure and services	MCHs and NCs are dependent on the public services such as water supply, gas, electricity and telecommunication. During construction, some adverse impact is expected.
6	Poor, indigenous people, ethnic group	There are some ethnic groups in hill areas within Chittagong Division. In addition, generally, it is said that low-income people are using public MCH rather than private hospitals and clinics in Bangladesh. During the operation of medical service, it is expected that MCHs will take care all of the patients irrespective of being poor, indigenous or ethnic people.
7	Misdistribution of benefit and damage	It is expected that all patients will have equal access to MCHs to get benefits by the proposed improved medical facilities. Misdistribution of benefit and damage among the people by this project should not occur.
8	Cultural heritage	Cultural heritage sites do not exist at all MCHs and NCs areas.
9	Local conflict of interest	There are no local conflicts of interest at all MCHs and NCs areas.
10	Usage of water and water right	There are some deep tube wells and shallow tube wells at MCH and NC areas. Water supply throughout the compound through pipe network at some MCHs and NCs, such as Dhaka MCH/NC and Mymensingh NC. There is no shortage of water at MCHs and NCs, and no conflict in water right between the hospital staff and patients.
11	Accident	There are many rickshaws at MCHs area, especially at near entrance and emergency center (Barisal MCH). Many rickshaws sometimes prevent patients and their families to enter hospital. It is expected that some accidents will occur during operation.
12	Sanitation	Sanitary condition is bad at all MCHs and NCs. Especially, the condition of latrines at old nursing hostel building is quite bad, at Dhaka NC and Barisal NC due to the lack of proper maintenance. There are many garbage strewn places at all MCHs and NCs. It is necessary to consider to establish some management system.
13	Infection disease such as HIV/AIDS	No patients having HIV/AIDS have yet been identified at all MCHs during survey period. It is expected that proposed facilities will be useful for HIV/AIDS patients during the operation.
14	Topography and geology	The topography of MCHs and NCs is flat and hilly. There is no important geographic feature around MCHs and NCs. Large scale geological alteration will not be expected through implement this project. No adverse impact is expected.
15	Soil erosion	The soil within the MCHs and NCs is found clayey and loamy with grass and vegetation coverage making it non erosive from rainfall runoff.
16	Groundwater	According to the interview to MCH staff, no chlorination or disinfection is done for the supply water either at the source level and the recipient level. At Chittagong MCH, iron is observed more than standard.
17	Hydraulic situation	There are no rivers and lakes at all MCHs and NCs.
18	Coastal zone	There are no coastal zones at all MCHs and NCs.
19	Flora, fauna and biodiversity	The open spaces of MCHs and NCs are covered with vegetation (including grass, valuable trees such as mango, neem and mahogany). Also there are some local birds and animals (cow and goat) at some MCHs (Barisal, Rajshahi and Mymensingh). Cutting of trees is expected to secure the land for construction. Some adverse impact is expected during the construction.
20	Meteorology	No adverse impact is expected by this project.
21	Landscape	Construction of multi-story hostels and Imaging Diagnostic Center will reduce open green space and affect the free movement of air and light. Some adverse impact is expected.

Item		Description
22	Global warming	It is expected that the amount of emission of greenhouse gas will be increased because of usage of construction machinery during construction. Some adverse impact is expected.
23	Air pollution	No existing source of air pollution is there at present. During the construction the air quality around the MCHs and NCs may slightly decrease due to dust and emission of smoke and carbon from construction machinery. Some adverse impact is expected.
24	Water contamination	There is no source of water pollution in and around MCHs and NCs. However, condition of drainage is bad at Barisal MCH due to the dumping of waste. No adverse impact is expected by this project.
25	Soil contamination	There is no source of soil contamination in and around MCHs and NCs. A slight soil contamination elsewhere appears to be there out of mismanagement of hospital waste.
26	Waste	At hospital level hazardous and non-hazardous wastes are collected, but it is uncertain if they segregate hazardous and non-hazardous wastes by source, collect and dispose accordingly. It is confirmed that City Corporation (Chittagong, Khulna, Rangpur MCH) and NGO (Dhaka MCH) collect wastes and dispose them with municipal waste to their dumping sites. Treatment of waste at all MCHs is quite bad. It is found that there are many places where various kinds of garbage are scattered. Not only installing of related facilities but also establishing waste management system including implementation training for hospital staff and students at all MCHs and NCs are needed urgently.
27	Noise and vibration	Currently there is no source of noise and vibration at MCHs and NCs. Construction related noise will be there and may affect the patients and staff. It is necessary to consider mitigation measures during the construction because of sensitive area.
28	Ground subsidence	No adverse impact is expected by this project.
29	Odor	There are sources of odor within MCHs and NCs somewhere. It seems that odor problem may arise from mismanagement of wastes. The same as 'waste', it is necessary to consider to implement training etc.
30	Bottom sediment	No adverse impact is expected by this project.

Source: The Survey Team

### 9.3.6 Proposed Mitigation Measures

Proposed Mitigation Measures that DGHS has confirmed are shown in following table:

Table 9-15: Proposed Mitigation Measures

Item	Rate	Mitigation Measure	Monitoring Item
Usage of water and water right	B-	<ul style="list-style-type: none"> <li>- Advance announcement of traffic information during construction period</li> <li>- Consideration to set up of new wells</li> <li>- Meeting with MCHs and NCs</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation of site survey</li> <li>- Confirmation of the contents of meetings and opinion by MCH and NC</li> </ul>
Accident	B-	<ul style="list-style-type: none"> <li>- Education on traffic rules for construction workers</li> <li>- Staffing for traffic control during construction</li> <li>- Advance announcement of construction period</li> <li>- Cooperation with traffic police</li> </ul>	<ul style="list-style-type: none"> <li>- Confirmation of the number of traffic control staff at MCH and NC (during construction)</li> </ul>
Sanitation	B-	<ul style="list-style-type: none"> <li>- Installation of temporary toilets for workers during construction and clean usage and maintenance</li> </ul>	<ul style="list-style-type: none"> <li>- Confirmation of the amount of toilets and their condition</li> </ul>

Flora, fauna and biodiversity	B-	<ul style="list-style-type: none"> <li>- Affected trees shall be confirmed in advance</li> <li>- Set up the marking of construction area</li> <li>- Transplant and replant trees instead of cutting</li> <li>- Minimization of cutting valuable trees such as mango, mahogany and neem</li> </ul>	<ul style="list-style-type: none"> <li>- Visual observation of the condition of vegetation at MCH and NC</li> <li>- Interviews to MOEF</li> </ul>
Air pollution	B-	<ul style="list-style-type: none"> <li>- Air quality analysis (if necessary)</li> <li>- Advance notice of construction schedule</li> <li>- Adjustment of working time</li> <li>- Using heavy machine matching with low pollution standard and regular maintenance</li> <li>- Keeping maintenance record</li> <li>- Avoiding unnecessary idling</li> <li>- Sprinkling of water around construction site</li> </ul>	<ul style="list-style-type: none"> <li>- Visual observation of the condition of dust distribution during construction</li> <li>- Confirmation of maintenance record</li> <li>- Interviews to MOEF</li> </ul>
Waste	B-	<ul style="list-style-type: none"> <li>- Selection of Environmental friendly disposal system (select, separate and inspection)</li> <li>- Education on waste separation and appropriate disposal for workers, MCH and NC staff</li> <li>- Human waste is treated properly at designated disposal place</li> </ul>	<ul style="list-style-type: none"> <li>- Visual observation of disposal condition at site and designated place at MCH and NC</li> <li>- Interview to MCH and NC staff</li> <li>- Survey regarding soil and liquid waste (if necessary)</li> </ul>
Noise and vibration	B-	<ul style="list-style-type: none"> <li>- Select construction methods which do not generate noise and vibration as much as possible</li> <li>- Adjustment of working time</li> <li>- Using noise attenuated type of machine and vehicle matching with standard and maintenance</li> <li>- Keep maintenance record</li> </ul>	<ul style="list-style-type: none"> <li>- Observation of the condition of noise and vibration during construction</li> <li>- Confirmation of maintenance record</li> </ul>
Odor	B-	<ul style="list-style-type: none"> <li>- Appropriate management of waste (including medical waste)</li> <li>- Using heavy machine matching with low pollution standard and regular maintenance</li> <li>- Keeping maintenance record</li> <li>- Avoid unnecessary idling</li> </ul>	<ul style="list-style-type: none"> <li>- Confirmation of maintenance record</li> <li>- Interview to MCH and NC staff</li> </ul>

### 9.3.7 Environmental Management Plan (EMP)

Proposed Environmental Management Plan that DGHS has confirmed are shown in following table:

Table 9-16: Proposed Environmental Management Plan

Items	Potential Impact	Proposed Mitigation Measure	Responsible agencies
<b>Before Construction</b>			
Environmental Procedure	Without obtain the ECC, the subprojects cannot be implemented and proposed facilities cannot be constructed	<ul style="list-style-type: none"> <li>• Carry out IEE study for the subproject along with the preparation of TOR for the EIA study if required and desired by DOE</li> <li>• Carry out EIA study in accordance with the approved TOR by DOE</li> <li>• Submission IEE/EIA reports</li> </ul>	MOHFW/DGHS DOE
<b>During Construction</b>			

Items	Potential Impact	Proposed Mitigation Measure	Responsible agencies
Usage of water and water right	Existing land used for plant, road, structure etc. will be affected	<ul style="list-style-type: none"> <li>• Advance announcement of traffic information during construction period</li> <li>• Consideration to set up of new wells</li> <li>• Meeting with MCHs and NCs</li> </ul>	MCH, NC, PWD, Contractor and Consultant
Accident	Construction workers, vehicle, rickshaws, bicycles can have harmful and critical trouble	<ul style="list-style-type: none"> <li>• Education on traffic rules for workers</li> <li>• Staffing for traffic control</li> <li>• Advance announcement of construction period</li> <li>• Cooperation with traffic police</li> </ul>	MCH, NC PWD Contractor
Sanitation	Due to the increase of workers, sanitary condition will be worse	<ul style="list-style-type: none"> <li>• Installation of temporary toilets for workers and clean usage and maintenance</li> </ul>	PWD Contractor
Flora, Fauna and Biodiversity	Cutting trees is expected to secure the land for construction	<ul style="list-style-type: none"> <li>• Affected trees shall be confirmed in advance</li> <li>• Set up the marking of construction area</li> <li>• Transplant and replant trees instead of cutting</li> <li>• Minimization of cutting valuable trees</li> </ul>	MCH, NC Contractor
Air pollution	Due to dust and emission of smoke and carbon from vehicles will be increased	<ul style="list-style-type: none"> <li>• Air quality analysis (if necessary)</li> <li>• Advance notice of construction schedule</li> <li>• Adjustment of working time</li> <li>• Using heavy machine matching with low pollution standard and regular maintenance</li> <li>• Keeping maintenance record</li> <li>• Avoiding unnecessary idling</li> <li>• Sprinkling of water around site</li> </ul>	MCH Contractor
Waste	Increasing of construction waste such as soil and trees	<ul style="list-style-type: none"> <li>• Selection of Environmental friendly disposal system (select, separate and inspection)</li> <li>• Education on waste separation and appropriate disposal for workers, MCH and NC staff</li> <li>• Human waste is treated properly at designated disposal place</li> </ul>	MCH/NC PWD Contractor
Noise and vibration	Due to usage of construction vehicle and machine, noise and vibration level will be increased	<ul style="list-style-type: none"> <li>• Select construction methods which do not generate noise and vibration</li> <li>• Adjustment of working time</li> <li>• Using noise attenuated type of machine and vehicle matching with standard and maintenance</li> <li>• Keep maintenance record</li> </ul>	Contractor
Odor	Due to usage of construction vehicle and machine, odor will be increased	<ul style="list-style-type: none"> <li>• Appropriate management of waste (including medical waste)</li> <li>• Using heavy machine matching with low pollution standard and regular maintenance</li> <li>• Keeping maintenance record</li> <li>• Avoid unnecessary idling</li> </ul>	MCH/NC PWD Contractor
<b>Operation and Maintenance</b>			
Waste	Both hazardous and non-hazardous wastes can cause health hazardous to the people	<ul style="list-style-type: none"> <li>• Provision of Waste separation by source, i.e. non-hazardous wastes in a bin and hazardous waste such as sharp wastes, infectious waste and human body waste in a colored bins as per international standard</li> </ul>	MOHFW DGHS MCH/NC

### 9.3.8 Environmental Monitoring Plan (EMOP)

The monitoring program for the various performance indicators are outlined in following table;

Table 9-17: Proposed Environmental Monitoring Plan

Items	Monitoring Means	Frequency	Location	Responsibility
<b>Before Construction</b>				
Environmental Procedure	Preparation and submission EIA report. And obtain ECC and SCC	Continuous until obtaining ECC and SCC	HQ and local DOE office.	MOHFW/DGHS DOE
<b>During Construction</b>				
Usage of water and water right	Direct survey in the target site to see the condition	Several time if needed	At MCH and NC	MCH, NC PWD, Contractor and Consultant
Accident	Physical observation	Twice a day	On the way of construction vehicle	MCH, NC PWD, Contractor
Sanitation	Physical observation	Once a day	Construction site	PWD, Contractor
Flora, Fauna and Biodiversity	Confirmation and marking affect trees	Once before construction	Construction site and surrounding area	MCH, NC Contractor
Air pollution	Onsite sample collection and testing if needed	Once before construction and once during the construction work	Construction site	Contractor
Waste	Physical observation	Once a day	Construction site	MCH/NC, PWD Contractor
Noise and vibration	Onsite sample collection and testing if needed	Once before and during the construction work	Construction site	Contractor
Odor	Physical observation	Once a day	Construction site	MCH, NC PWD, Contractor
<b>Operation and Maintenance</b>				
Waste	Observation related hazardous and non-hazardous waste	Continuous on daily basis	At MCH (especially within the Imaging Diagnostic Center)	MOHFW/DGHS MCH/NC

### 9.3.9 Cost, Budget and Implementation System

Cost involve in the implementation of Environmental Management and Monitoring plan. Such cost depend on the type and extent of the mitigation measure, amount as well as their unit rate. In this report, a tentative Environmental Management and Monitoring plan has been designed, which will be updated after decide exact location for each construction during the detail design work based on the actual design work. Therefore, detail cost estimation and further analysis will be necessary for next stage.

Regarding the Implementation system, total responsible agency is Planning Unit of MOHFW. The department of section which in charge of Environmental Procedure such as preparation IEE/EIA,

application ECC and Discussion with DOE is DGHS (Director General of Health Service) under supervision by Planning Unit.

During the construction, PWD (Public Work Department) of MOHPW (Ministry of Housing, Public Works) is responsible agency. PWD will hire the contractor which undertake the construction work including environmental management and monitoring. Usually, PWD also hire the environmental consultant. The consultant will monitor environmental management implementing by contractor. Overall PWD supervise all activities by contractor and consultant.

### 9.3.10 Stakeholders Meeting

Main agenda of meeting and contact person at each agency related to the Imaging Diagnostic Center, Nursing College Building and CC Construction are shown in following table;

Table 9-18: Outline of Stakeholders Meeting

Agencies	Date	Contact persons and agenda of discussion
Department of Environment (DOE), MOEF	9th July	Md. Madudur Rashid Safdar (Director of Dhaka Metropolis)
		Dr. Md. Sohrab Ali (Deputy Director of Dhaka Metropolis)
		✓ Introduction of the Project and explanation of JICA Guidelines
		✓ IEE/EIA procedure, categories, Environmental Certificate etc.
Department of Environment (DOE), MOEF	3rd September	✓ Experience of IEE/EIA and other information
		Md. Shahjahan (Additional Director General, DOE)
		Md. Towfiqul Arif (Director/Deputy Secretary)
		✓ Introduction of the Project and explanation of JICA Guidelines
Dhaka MCH/NC	30th June	✓ Confirmation IEE/EIA procedure, Environmental Certificate etc.
		✓ Experience of IEE/EIA and other information
		✓ Adoption of Category related CC
		Dr. Md. Musfiqur Rahman (Deputy Director of MCH)
Mymensingh NC	10th July	✓ Introduction of the Project
		✓ Experience of IEE/EIA at Dhaka MCH/NC
		✓ Environmental challenges at Dhaka MCH/NC
		Monowara Khatun (Principal)
Chittagong MCH/NC	8th July	Khaleda Khatun, Tahmina Khatun (Nursing Instructor)
		✓ Introduction of the Project
		✓ Experience of IEE/EIA
		✓ Environmental challenges (waste management)
Khulna MCH	6th July	Brig. Gen. Khondakar Shahidul Ghani (Director of MCH)
		Hosne Ara Begum and 6 Instructors (Principal of NC)
		Mohammad Monirul Islam (Executive Engineer of PWD)
		Abu Taher (Sub-Divisional Engineer of PWD)
		✓ Introduction of the Project
		✓ Experience of IEE/EIA
		✓ Environmental challenges (waste management)
		Dr. Md. Abdus Samad (Director of MCH)
		Arifa Aktar (Principal of NC)
		✓ Introduction of the Project



Agencies	Date	Contact persons and agenda of discussion
		<ul style="list-style-type: none"> <li>✓ Experience of IEE/EIA</li> <li>✓ Environmental challenges (waste management, water usage)</li> </ul>
Rajshahi MCH/NC	3rd July, 20th July	Hasan Ahmed Sarwar (Executive Engineer) <ul style="list-style-type: none"> <li>✓ Introduction of the Project</li> <li>✓ Experience of IEE/EIA</li> <li>✓ Environmental challenges and other information</li> </ul>
Rangpur MCH/NC	21st July	Dr. Md. Golam Mostofa (Director of MCH) Mrs. Lutfunnesa (Principal of NC) <ul style="list-style-type: none"> <li>✓ Introduction of the Project</li> <li>✓ Experience of IEE/EIA</li> <li>✓ Environmental challenges (waste management)</li> </ul>
Sylhet MCH/NC	17th July	Brig. Gen. Dr. Mizanur Rahman (Director of MCH) Shilpi Chakrabarti (Principal of NC) <ul style="list-style-type: none"> <li>✓ Introduction of the Project</li> <li>✓ Experience of IEE/EIA</li> <li>✓ Environmental challenges (waste management)</li> </ul>
Department of Environment (DOE), MOEF	3rd September	Md. Shahjahan (Additional Director General, DOE) Md. Towfiqul Arif (Director/Deputy Secretary) <ul style="list-style-type: none"> <li>✓ Introduction of the Project and explanation of JICA Guidelines</li> <li>✓ IEE/EIA procedure, categories, Environmental Certificate etc.</li> <li>✓ Experience of IEE/EIA and other information</li> <li>✓ Adoption of Category related CC</li> </ul>
DGHS	4th September 8th September 3rd December 18th January 22nd January	Prof. Dr. A B Abdul Hannan (Director of DGHS) Dr. A S M Nagmul Hug <ul style="list-style-type: none"> <li>✓ Introduction related document: IEE, TOR for EIA, Screening sheet Checklist, Monitoring sheet and ESMS for CC</li> <li>✓ Explanation further procedure</li> <li>✓ Confirmation Environmental Checklist (revised)</li> <li>✓ Confirmation Mitigation Measure (revised)</li> </ul>
CBHC	3rd December 11th January	Dr. Makhduma Nargis (Additional Secretary and Project Director) Dr. Barendra Nath Mandal (APD, PR&T) <ul style="list-style-type: none"> <li>✓ Confirmation ESMS Checklist</li> <li>✓ Confirmation ESMS Monitoring Form</li> </ul>

## 9.4 Environmental Impact Evaluation (CCs)

### 9.4.1 Outline of Project

In 1996, as part of its primary health service plan, the Government took the initiative to set up 13,500 CCs, the equivalent of one clinic for every 6,000 people in the country's rural areas, where nearly three quarters of all inhabitants live. Between 1998 and 2001, 10,723 clinics were built, most of them on donated land to ensure the active participation of people. As they are one of the "sub projects within HPNSDP", the remaining clinics will be built by MOHFW.

MOHFW has a Principle of CC Construction. Site selection is an important part of the process, and it is based on the following criteria:

Table 9-19: Conditions for Site Selection for CCs

- Benefit approximately 6,000 people (an average of 4,500–7,500)
- Easy to access, flood-free, high land, not low or wetlands
- Not near graveyards or funeral places
- Away from areas prone to river erosion
- Adjacent to homes to ensure the clinic's security and safety
- Minimum of 2 km between two CC
- Minimum 5 decimals (around 202.3m<sup>2</sup>) of land donation
- Land acquisition process if a donor is not found



Source: Principle on the Establishment of the Community Clinic (April, 1999)

The figure below shows a plan for a typical CC

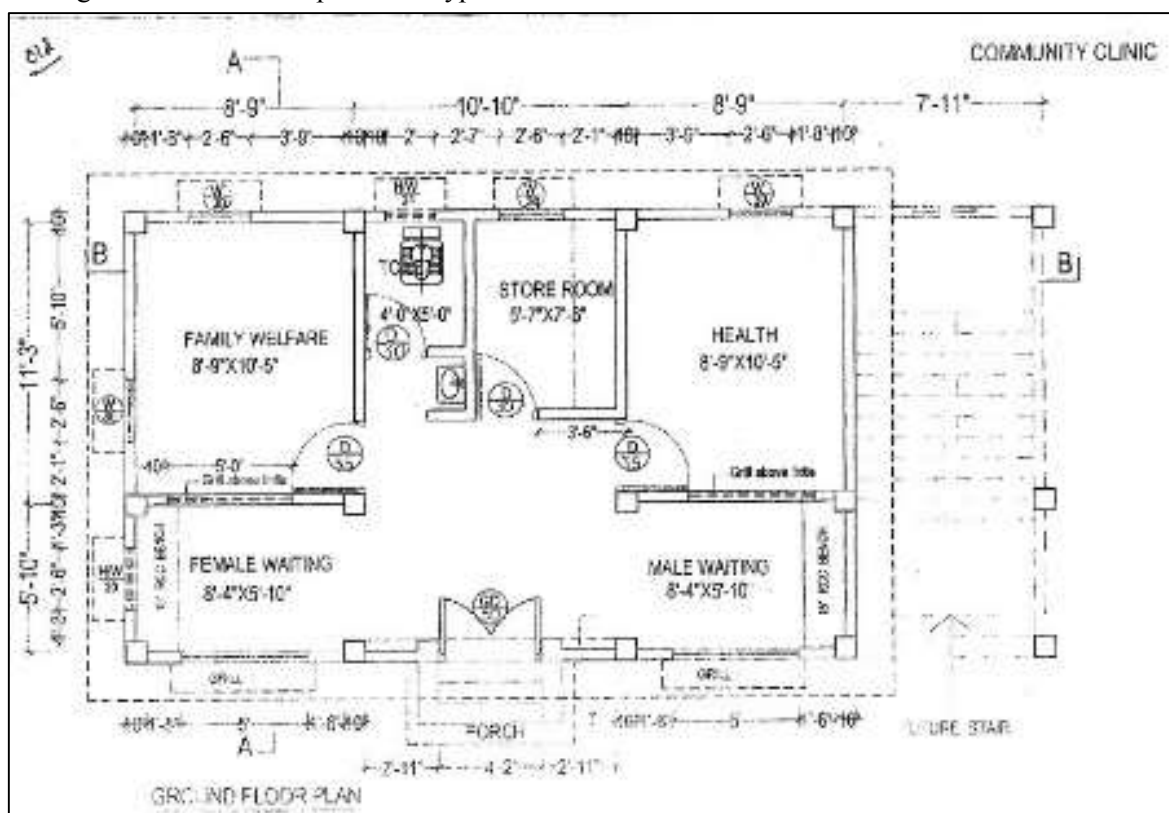


Figure 9-4: Drawing of a CC (two-room type)

#### 9.4.2 Related Organizations

The implementation agency for CCs is the CBHC/RCHCIB at a national level. One Line Director/Project Director and seven Program Managers are allocated to such departments as Human Resource Management and Community Mobilization. The Department of Infrastructure Management Monitoring and Supervision (IMMS) is the responsible department for CC. Every financial year, the Line Director prepares an annual CC plan and MOHFW finalizes that list.

At a community level, the community group (CG) set up in each community is the implementation group for the CC. The Upazila Health and Family Planning Officer (UHFPO) is a representative user and supervises the entire process in partnership with the Medical Officer. An organogram of the national level and the community level for CCs is as follows:

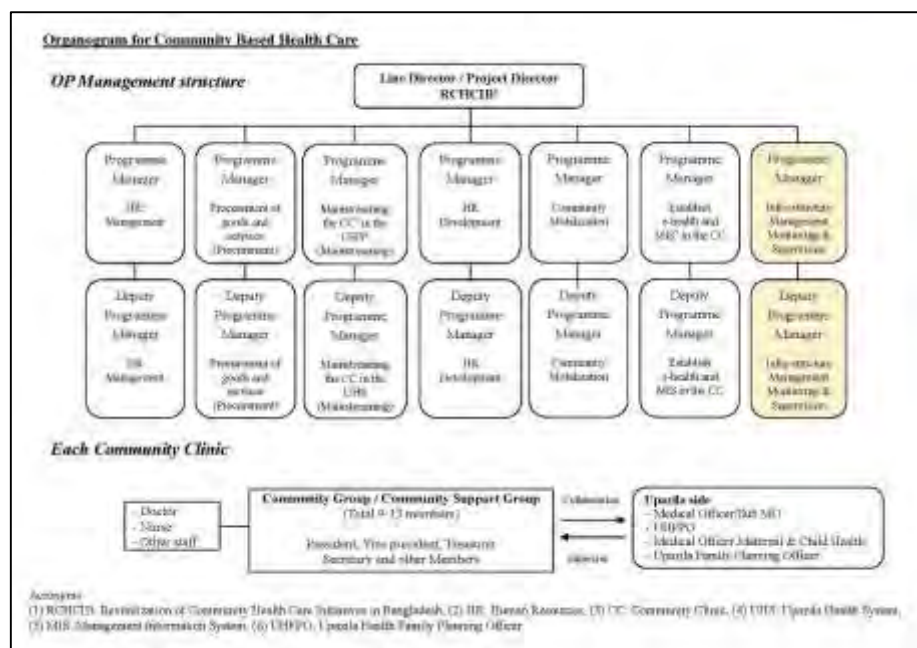


Figure 9-5: Organogram of CC Construction

### 9.4.3 Exemption from the Environmental Procedure

As mentioned above in 9.2.2 (3), the classification of category for CC construction is Category Orange-B, according to the ECR in Bangladesh. A project that is categorized as Orange-B requires an IEE study and must obtain environmental clearance certificate from the DOE. The DGHS discussed this environmental procedure with the DOE. Then the DGHS prepared a letter that provided an outline of the background of the CC project, and included a request for an exemption from the environmental procedure. In October 2014, the DOE issued a letter stating that it had no objection to that request from the DGHS. Therefore, the DOE approved CC construction without implementation of an IEE study.

### 9.4.4 Environmental and Social Monitoring System (ESMS)

#### (1) World Bank (WB) Criteria

This CC construction project is categorized as an FI, according to the JICA Guidelines for Environmental and Social Considerations (April 2010). So an ESMS checklist and an ESMS performance report are required by the Loan Appraisal Mission. In addition, as an ODA loan project, it is necessary that the WB criteria (OP. 4.12) that stipulate the requirements for land

donations are met. This is because the construction sites for clinics are usually made possible through donations by people in the community. The following criteria are suggested as a guideline on WB OP. 4.12.

1. The infrastructure must not be site specific.
2. The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.
3. The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities (nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards).
4. The land in question must be free of squatters, encroachers, or other claims or encumbrances.
5. Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from *each* person donating land.
6. If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigation measures must be obtained from those expected to be adversely affected.
7. If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder.
8. Grievance mechanisms must be available.

During the survey period, the Survey Team confirmed the condition of one sample of CCs. By checking the related document for the CCs (e.g., establishment of committee, list of committee members, name of the landowner, deed agreement, the dimension of donated land and location, the land certificate and the handover form), the Survey Team confirmed that the sample had cleared the WB criteria. However, not all planning on CC sites has been decided yet. So, the Survey Team proposed that CBHC prepare a WB checklist for CC, and CBHC has agreed to use it before starting on a CC at any site. The WB checklist is included in the ESMS checklist.

## (2) ESMS Checklist and ESMS Performance Report Form

The CBHC agreed the contents of the ESMS checklist and performance report before the Loan Appraisal Mission in February 2015. In addition, CBHC will prepare ESMS performance reports quarterly.

## **CHAPTER 10:**

### **Other Activities**



## **CHAPTER 10: Other Activities**

### **10.1 Medical Technology Exposure Visit in Japan**

#### **10.1.1 Background**

The Survey Team examined the current situation of the health sector and medical equipment in Bangladesh, considering the applicability of Japanese advanced medical technology in the field. The idea is consistent with Japan's Strategy on Global Health Diplomacy. Based on the findings of the survey, the Survey Team proposed to update the existing equipment in seven MCHs and introduce new imaging diagnostic equipment such as CT and MRI.

As part of the survey, JICA invited the MOHFW and the concerned officials to Japan with the aim of presenting the imaging diagnostic technology and its utilization in Japan.

The program consisted of a visit to the site where Japanese imaging diagnostic equipment is manufactured and to hospitals applying the equipment and operating with an integrated data management system.

#### **10.1.2 Purpose of the Visit**

The purpose of the visit was to promote a better and more comprehensive understanding of Japanese imaging diagnostic technology with the following specific topics:

- Advantage of advanced imaging diagnostic technology
- Actual use of the equipment in medical institutions
- Advantage of the digitalized system (PACS/RIS)
- Utilization of digital images for medical education
- Application of total quality management (TQM) at the medical facilities

#### **10.1.3 Period of the Visit**

The visit took place November 15, 2014, through November 20, 2014 (six days).

#### **10.1.4 Participants**

The candidates who participated in the visit were listed in the discussion between JICA and the Survey Team and then defined as the comments from the Bangladesh side. The participants are listed below.

Table 10-1: List of the Participants

No	Prefix	Name	Position	Organization
1	Mr.	Mohammed Nasim	Minister of Health and Family Welfare	Ministry of Health and Family Welfare (MOHFW)
2	Mr.	Mohammed Abu Taher	Additional Secretary for Ministry of Finance	Ministry of Finance (MOF)
3	Mr.	Quazi A.K.M Mohiul Islam	Private Secretary for Minister	MOHFW
4	Mrs.	Niru Shamsun Nahar	Joint Chief of Planning Wing	MOHFW
5	Prof. Dr.	Deen Mohammad Noorul Huq	Director General	Directorate General of Health Services (DGHS), MOHFW
6	Prof. Dr.	A. B. M. Abdul Hannan	Director of Hospital & Clinics/ Medical Education and HMPD	DGHS, MOHFW
7	Brigadier General	Mohammad Golam Rasul	Director of Central Medical Stores Depot	DGHS, MOHFW
8	Prof. Dr.	Syed Mizanur Rahman	President	Bangladesh Society of Radiology and Imaging

#### 10.1.5 Program and Schedule

The program was composed mainly of the site visit to the imaging diagnostic equipment manufacturers and hospitals rather than of the lecture. The aim of the site visit was to enhance the comprehensive understanding of the specific advantage of each type of equipment, its technical need, and its utilization. Regarding the training for medical professionals, the program offered to visit the International Research Center for Medical Education (IRCME) at the University of Tokyo. The participants had an opportunity to discuss how medical professionals shall be trained or how their skills shall be updated.

The schedule of the visit is shown below.



Table 10-2: Schedule

Date		Time	Activities			Stay	
		PM	Arrival at Tokyo, Move to Hotel in Tokyo			Tokyo	
			Programme Briefing				
16-Nov-14	Sun		Preparation for site visits			Tokyo	
17-Nov-14	Mon	10:00 - 11:00	Courtesy Call on <u>JICA</u> (Chiyoda-ku)			Tokyo	
		Group A		Group B			
		11:30 - 12:30	Ideas Exchanging Session on <u>METI</u> (Ministry of Economy, Trade and Industry) (Chiyoda-ku)	AM	Move to Manufacturer		
		13:45 - 14:00	Courtesy Call on <u>MHLW</u> (Ministry of Health, Labour and Welfare) (Chiyoda-ku)	12:30 - 14:45	Site Visit for Manufacturer <u>HITACHI Medico</u> (Hitachi Medical Corporation) (Kashiwa, Chiba)		
		16:20 - 16:50	Courtesy Call on MOFA (Ministry of Foreign Affairs of Japan) (Chiyoda-ku)	15:00 - 16:30	Site Visit for Hospital The <u>Jikei University Kashiwa Hospital</u> (Kashiwa, Chiba)		
		18:00 - 19:30	Technical Exchange in Tokyo (Hotel Okura Tokyo) (Erbis Engineering, Fuji Film Medical, Infinity Medicalsoft ,Konicaminolta Health Care, Olympus Medical Systems, Omron Health Care, Pentax Medical/Hoya, Shimadu, Sysmex) (*Alphabetical order)				
18-Nov-14	Tue	Group A		Group B		Kyoto	
		9:30 - 10:00	Meeting with Mr. Seki <u>Parliamentary Secretary of METI</u> (Hotel Okura Tokyo)	9:45 - 11:00	Site Visit for Manufacturer <u>Sysmex Corporation</u> (Shinagawa-ku)		
		10:00 - 11:00	Meeting with Otsubo Medical Corporation (Hotel Okura Tokyo)				
		12:00 - 13:00	Lunch hosted by <u>Parliamentary Friendship League</u> (Chiyoda-ku)	12:00 - 13:30	International Research Centre for Medical Education, Graduate School for Medicine, the <u>University of Tokyo (IRCME)</u> (Bunkyo-ku)		
		14:00 - 16:00	Site Visit for Hospital <u>TOSHIBA General Hospitals</u> (Shinagawa-ku)				
		PM	Move to Kyoto				
19-Nov-14	Wed	10:00 - 14:00	Site Visit for Manufacturer <u>Shimadzu Corporation</u> (Kyoto city)			Kyoto	
		PM					
20-Nov-14		AM	Move to Kansai Airport Flight to Bangladesh			-	

#### 10.1.6 Findings and Outcomes of the Visit

In Bangladesh, seven top MCHs have been equipped with and have utilized image-diagnosis equipment. However, much of this equipment has already exceeded the maximum duration of the maintenance period. Also, the image data and information are not managed in an integrated system, which affects the accuracy of diagnoses as well as extending the time required for examination.

During the visit to the equipment manufacturers, participants actively paid attention to the presentation of the equipment displayed in the showroom and asked many questions such as how this equipment was different than conventional equipment. Exposure to high-standard medical equipment and a pleasant environment for medical examination seemed to give participants an idea of the advantages of advanced imaging diagnostic technology and how to utilize it in Bangladesh.

Regarding application of the equipment, participants learned how Jikei University Kashiwa Hospital and Toshiba Hospitals use the image data for diagnosis and how integrated data management can be useful to avoid misdiagnoses and medical malpractice.

During the program, the participants shared the present issues and problems of the health sector in Bangladesh, mentioning the necessary assistance from Japan. They were actively engaged in discussion, especially with the equipment manufacturers, and they asked many questions such as how to operate and maintain the equipment.

At each visit site, time was provided for questions and answers and for discussions in order to facilitate better understanding. Also, courtesy calls from the Ministries, the Government of Japan provided opportunities for policy-level discussions and reconfirmed the direction of the partnership between Japan and Bangladesh.

## 10.2 Technical Workshop on Medical Equipment

Besides the visit in Japan, as a promotion for a better and more comprehensive understanding of Japanese imaging diagnostic technology in Bangladesh, the Survey Team planned to hold a technical workshop on medical equipment on February 18 and 19, 2015 intended for various stakeholders such as MOHFW officials, MCHs, and other relevant medical institutions in Bangladesh.

The focus of the workshop is to foster understanding of Japan's imaging diagnostic equipment, its technical usage and maintenance of the equipment. The workshop also highlights the usefulness of digitalizing image data to enhance medical institutions' data-management capacity. In the workshop, medical experts on imaging diagnosis as lecturers were supposed to be invited from Japan, and also equipment agents in Bangladesh and manufacturers in Japan were expected for participation.

However, on account of the strike which had been going on all around Bangladesh since the end of December 2014, it had been uncertain when the public security could have been improved. At last, in consideration of prospective participants' security, cancellation of the workshop was officially determined on the 4<sup>th</sup> of February 2015 in accordance with JICA's security code.

## **CHAPTER 11:**

## **Conclusions and Recommendations**



## **CHAPTER 11: Conclusions and Recommendations**

### **11.1 Conclusions**

#### **(1) Economic rising country**

As a country, Bangladesh is a young nation since their independence of 1971. It is said that Bangladesh has an impressive track record for growth and development, aspiring to be a middle-income country by its 50th birthday. This growth has been based on its large population, especially young workforce generation.

#### **(2) Disease profile shift**

Bangladesh has been making good progress in almost all of the health-related MDGs especially child mortality rates, MMR and indicators of communicable diseases. However, maternal health service coverage is still lower than its neighboring countries. While the MNCH and communicable diseases indicators have been improving, the burden of NCDs including injury has been rapidly increasing and it accounts for 61% of the country's total disease burden. The proportion of morbidity in Bangladesh has been shifting from communicable diseases to NCDs. There is an urgent need to respond to increase in NCDs.

#### **(3) Health services**

MOHFW is the lead agency responsible for formulating national policy, planning and decision making in the provision of healthcare services. DGHS is the implementing authority of provision of health services at health facilities. Public MCHs are tertiary referral hospitals in their divisions and they provide advanced medical services such as imaging diagnostic service which is effective to diagnose NCDs and is able to detect early stage of NCDs correctly. MCHs provide medical services in affordable fee for poor people and they accept emergency cases 24-hours every day. In addition, MCH has a role of medical teaching hospital, therefore, there are rich-experienced doctors, young doctors and skilled medical technologists. Lack of nurses is a critical issue in Bangladesh.

#### **(4) Survey results**

The Survey Team visited tertiary, secondary and primary health facilities. Most of the MCHs had similar big challenges; overloaded patients, almost expired high-cost medical equipment, aging buildings with insufficient radiation protection at radiology departments and lack of patient record management system. Patients also suffered from congestion in MCHs such as long waiting time for diagnosis and high bed occupancy. Some patients can alternatively go to private hospitals to take examinations but poor people cannot afford to take examinations with much higher

examination fee at privates.

On the other hand, DHs do not have so many patients. However, some consistent challenges were seen; lack of health workers especially specialists such as anaesthetists and gynaecologists who are necessary for providing CEmOC, unstable power supply, and lack of infrastructure. These challenges cannot be solved by only investment in facility buildings and medical equipment at present. The Yen Loan Project Phase 1 supports 6 DHs for up-gradation of hospital building, however, there is no plan to install necessary medical equipment.

The Survey Team visited seven BSc nursing colleges during the field survey. The students' hostels were occupied and some buildings were aging. Some academic buildings were new but the space was not sufficient to respond to increase of number of students. Skill laboratories were already organized, however, the numbers of equipment were not sufficient and some of them were old and broken.

#### (5) Analysis

The selection criteria of sub-projects of the Project are; MNCH issues, coordination with HPNSDP 2011-2016, UHC, gender-mainstreaming, utilization of Japanese technology and coordination and cooperation with other JICA projects.

For the short-term period, supporting HPNSDP 2011-2016 for its completion on time is appropriate, especially in the fields of MNCH and nursing education where JICA contributes as technical cooperation now and future.

For MNCH issues, the MNCH service coverage is low. Support for community-based MNCH service is effective to expand access to the service in rural areas and it can accelerate UHC. JICA has been supporting community-based MNCH services through SMPP1-2 and the Yen Loan Project Phase 1. Thus, the continuous support for community-based MNCH services through HPNSDP 2011-2016 is suitable as a sub-project within HPNSDP 2011-2016. In addition, a technical cooperation project for nursing education is being planned by JICA. To collaborate with the technical cooperation, support for BSc nursing colleges is also considerable to increase the number of nurses.

In addition, procurement of medical equipment for DHs can complete the work which JICA has supported construction on expansion of the facilities by the Yen Loan Project Phase 1.

The Survey Team found the urgent need to support MCHs during the field survey. Essential infrastructure setting by the government helps MCHs for stable power supply, and middle-cost level medical equipment are replaced on schedule, but procurement of high-cost equipment delays. In order to respond to increase of NCDs, the provision of imaging diagnostic equipment is

effective. In addition, for gender-mainstreaming, imaging diagnostic equipment is useful for early detection of female specific cancers and echo machine is popular for monitoring pregnancy.

Our survey results show that MCHs have potentials to provide advanced medical services when proper equipment and facility are upgraded. To solve current situation of overcrowding at MCHs, strengthening of MCHs is prioritized as urgent need. Support for MCH can contribute to UHC as well because MCHs provide health services in affordable fee for poor people and MCHs train various health professionals. If the Project covers all divisions, it can contribute to accelerate UHC countrywide and to reduce the gaps between rural and urban area.

Regarding imaging diagnostic equipment, there are global major medical equipment manufactures in Japan and the Japanese technology can be utilized.

For improvement of patient information management, introduction of PACS/RIS is effective and efficient. PACS/RIS can accumulate the diagnostic images and patient records in the hospital without wide space. Those data is effective to compare the ante and post treatment to follow-up, to reduce the human error of mixing patient and data, and to use accumulated data for research and medical education as teaching hospital. In the future, there is a potential to develop distance medicine between hospitals using data archives. This can innovate the information management in MCHs.

#### (6) Selection of sub-projects

Considering the current situation in health sector and selection criteria, the Survey Team concluded as follows.

##### 1) Sub-projects within HPNSDP 2011-2016

To improve MNCH coverage

- Training of CSG under CBHC OP
- Training for FWVs on midwifery and EmOC under MCRAH OP
- Distribution of MCH kit and FWC kit to UHFWCs under MCRAH OP
- New construction of CCs under CBHC and PFD OP

To improve the education environment of BSc nursing colleges coordinating with JICA's future technical cooperation for nursing education

- New construction of hostels under PFD and NES OP
- Extension of academic buildings under PFD and NES OP
- Provision of equipment for skill laboratory under NES OP

To complete the up-gradation of DHs supported by JICA

- Provision of medical equipment under HSM OP

## 2) Sub-projects beyond HPNSDP 2011-2016

The Survey Team concluded that the establishment of imaging diagnostic centers at seven MCHs in each division is the most applicable to respond to increase of NCDs, to solve MCH's challenges, to contribute to UHC and gender-mainstreaming, and to utilize Japanese technology.

The sub-projects are;

- Provision of imaging diagnostic equipment at seven MCHs to replace expired equipment or to additionally install.
- New construction of imaging diagnostic center at seven MCHs to centralize installation of imaging diagnostic equipment in safe environment against radiation exposure
- Training to utilize imaging diagnostic equipment to enhance operational and diagnostic capacity of health professionals

Besides, further benefits are expected by introduction of PACS/RIS as tertiary hospitals

- Introducing the PACS/RIS will help the hospital store patient records efficiently using minimal space. These data will help doctors compare pre- and post-treatment situations, and reduce the errors caused by incorrect storage of patient records.
- The accumulated data can be used for research and medical education by MCHs as teaching hospitals. In the future, there is the potential to undertake long-distance medical care by allowing hospitals to share their patients' data archives.

Both sub-projects within and beyond HPNSDP 2011-2016 are feasible, according to the survey results and analysis.

## 11.2 Recommendations

The sub-project within HPNSDP 2011-2016 will be implemented under the responsibility of OP-line directors. Thus, recommendations are mainly for the sub-project beyond HPNSDP 2011-2016, establishment of imaging diagnostic centers.

### (1) For smooth operation of the project implementation

MCHs are recommended to prepare the recruitment on the timing of equipment installation on;

- Female radiology technologist/ radiologist for the operation of mammography to make patients feel at ease during examination.



- IT engineer for the daily operation and maintenance of PACS/RIS, or establishment of IT section itself.
- Receptionists in the imaging diagnostic center to register patients on RIS

There is a possibility of advanced training for responsible operators before equipment installation for smooth opening of the imaging diagnostic center; hence, the recruitment timing should be harmonized with the implementation schedule.

DGHS is recommended to recruit DEMEW engineers who have proper background in IT and advanced medical technology. Generally, major medical equipment is not able to be repaired by electricians and it is necessary to request agent's maintenance without touching the equipment. However, DEMEW engineers and hospital users/operators should be responsible for daily maintenance and help prevention for irreparable failure.

## (2) For feasible management after the project completion

Before/after the installation of equipment by the Project, existing one will be into line for replacement. For nationwide management of patient data processing in the future, it is recommended to discuss in DGHS how to develop the common patient code and how to categorize patient database, when RIS is introduced. Fundamentally, it is recommended to have common software in RIS and reach a consensus to use the same registration system. To expand the PACS/RIS network in the whole hospital, specification of the new equipment should be considered for connecting with the network.

Furthermore, it will be effective to make a concept for distance medicine between MCHs and DHs. When DHs install new imaging diagnostic equipment, introduction of PACS can be strategic for the future.

Generally speaking, it is difficult to find a specialist who can diagnose and treat complicated cases correctly at upazila level. If the doctors in rural areas can diagnose complicated cases, the patients can be cured faster. At the same time, while contents that medical school has to teach are increasing, the duration of the education courses is limited in the school. In order to effectively use the learning time that has become relatively short, it is required to teach in clinical practice. Besides, clinical treatment has a tendency to attach too much importance to higher skill. Thus, it is necessary to consider a way for outcomes to be based on well-balanced combinations of medical technology and clinical competencies, standardization of quality of medical technology and evidence-based medicine. For those aspects, the following issues will be recommended to MCHs and MOHFW.

- Introduction of self-study system for undergraduates and postgraduates using imaging diagnostic center.

- Developing case conferences using imaging diagnostic data archives from pre/post treatment and for follow-up treatment.
- Standardizing the quality of operator's technique by periodical external audit.
- Enhancing the submission of academic papers using imaging diagnostic data archives.
- Developing the technical training courses for DH staffs using imaging diagnostic center.
- Securing budget for additional operational cost such as water and power supply for building and equipment if the new equipment is additionally installed in the hospital without replacement.

### (3) For effective and functional operations of imaging diagnostic centers

In order to achieve effective and functional operations of imaging diagnostic centers, role and responsibility of imaging diagnostic centers should be clearly demarcated from the operations of the existing MCHs. At the same time, efficient collaboration of both facilities and operations to exhibit a synergy effect will reduce the waiting time of patients and reduce possibility of medical errors.

For operational demarcation and collaboration of the existing MCHs and imaging diagnostic centers, the following matters should be respected by MCHs and MOHFW.

- In order to increase the operational rate of medical equipment and enhance the effectiveness of multidirectional examination, the imaging diagnostic equipment should be centralized in one location and specialized only for examination and diagnosis. In particular, the function of angiography equipment should be clearly demarcated between only radiological examination in imaging diagnostic center and diagnosis and treatment with surgical procedures in the main building of MCH, since operating theater, ICU and supporting facilities such as central supply and sterilization units are already provided.
- Imaging diagnostic center should be utilized not only for diagnostics, but also education and practice for students and staff in order to familiarize themselves with modern technology and understand the importance of safe and clean environment.
- In order to increase the operational rate of medical equipment, proper staffing and budgeting should be arranged prior to the completion of construction of imaging diagnostic center at each MCH.

## **Annex**



**THE MINUTES OF MEETINGS**  
**ON**  
**THE PREPARATORY SURVEY**  
**ON**  
**MATERNAL, NEONATAL AND CHILD HEALTH IMPROVEMENT PROJECT (PHASE 2)**  
**(HEALTH, POPULATION AND NUTRITION SECTOR DEVELOPMENT PROGRAM)**  
**IN**  
**THE PEOPLE'S REPUBLIC OF BANGLADESH**  
  
**AGREED UPON BETWEEN**  
  
**THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH**  
  
**AND**  
  
**THE JAPAN INTERNATIONAL COOPERATION AGENCY**

Dhaka, January 19, 2014

富田 洋行

Hiroyuki Tomita  
Senior Representative  
Japan International Cooperation Agency  
(JICA)

Nirman

Niru Shamsun Nahar  
Joint Chief (Planning Wing)  
Ministry of Health and Family Welfare  
Government of the People's Republic of  
Bangladesh

The Government of the People's Republic of Bangladesh (hereinafter referred to as "GOB") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") have made several preliminary discussions in order to identify priority areas for cooperation and agreed to make preparation for the Maternal, Neonatal and Child Health Improvement Project (Phase 2) (Health, Population and Nutrition Sector Development Program) (hereinafter referred to as "the Project"). Accordingly, the representatives of the JICA Bangladesh Office visited and discussed with the officials concerned in order to develop scope and implementing arrangements of a further survey which will study the feasibility of the Project (hereinafter referred to as "the Preparatory Survey"). The scope and implementing arrangements of the Preparatory Survey are described in the Appendix 1. The main points discussed during its visit are described in the Appendix 2.

It should be noted that implementation of the Preparatory Survey does not imply any decision or commitment by JICA to extend its loan for the Project at this stage.

Appendix 1: Scope and Implementing Arrangements of the Preparatory Survey

Appendix 2: Main Points Discussed

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## SCOPE AND IMPLEMENTING ARRANGEMENTS OF THE PREPARATORY SURVEY

### **I. BACKGROUND AND OBJECTIVES OF THE PREPARATORY SURVEY**

Major improvements have been made in Bangladesh's health sector, particularly in the area of infectious disease control such as immunization programs and the battle against tuberculosis. In the area of maternal and child health, advances have been made such as the improvement of the infant mortality rate (per 1,000 live births, 92 in 1990 and 43 in 2011), the under-five mortality rate (per 1,000 live births, 146 in 1990 and 53 in 2011), and the maternal mortality ratio (per 100,000 live births, 574 in 1990 and 194 in 2010). However, further efforts are needed to achieve the Millennium Development Goals (MDGs), for which major challenges including the low proportion of births attended by skilled health personnel, nutritional problems, and low service usage rate of impoverished groups, remain unsolved. The proportion of births attended by skilled birth attendants is quite low (31.7% in 2011) in comparison with the averages for South Asia and other developing countries. In particular, the access to maternal and child health services are very limited among the poorest in the society. While the proportion of stunting children is steadily decreasing, the progress in decreasing the proportion of underweight children has been slow. Thus, further efforts are needed to ensure sufficient nutritional status. To improve these health indicators, services provision must be improved in the health, nutrition and population (HNP) sector and at the same time, the use of these services must be encouraged through awareness raising.

Improving service provision requires further efforts to establish a more consistent health system that extends from local community to tertiary levels including the appropriate allocation and management of facility development, human resources, materials, budgets, and other data and information. Further initiatives have to be taken to enhance the stewardship role and capacity of the Ministry of Health and Family Welfare, appropriately develop and allocate health personnel, enhance planning and budget allocation based on local needs, and improve referral systems.

In order to tackle these issues in the health sector, GOB together with development partners developed 'Health, Population and Nutrition Sector Development Program' (July 2011 – June 2016) (herein after referred to as "HPNSDP") as a comprehensive development plan in the sector. HPNSDP aims to ensure quality and equitable health care for all citizens in Bangladesh by improving access to and utilization of health, nutrition and population (HNP) services.

JICA has been supporting the efforts of GOB especially in the areas of maternal, neonatal and child health and health system strengthening through technical cooperation, known as Safe Motherhood Promotion Project (SMPP) Phase- I&II and yen loan (the Maternal, Neonatal and Child Health Improvement Project (Phase 1) (Health, Population and Nutrition Sector Development Program). The Phase 1 of the yen loan is provided to meet the financial demand of the first three years of HPNSDP. Since the Phase 1 has been progressing almost as planned, the Preparatory Survey will be conducted to examine the feasibility of the Phase 2 of the project.

The objective of this Preparatory Survey is to propose the scope for further JICA assistance to HPNSDP and beyond and conduct detailed analysis on various issues for project implementation such as the detailed plan, cost estimation, implementation and operation and maintenance structure, environmental and social considerations.

## **II. SURVEY AREA**

Nationwide on the basis of survey design

## **III. SCOPE OF THE PREPARATORY SURVEY**

### **1. Terms of Reference**

The Preparatory Survey shall cover the following items:

#### **a. Background and Necessity of the Project**

- To review the existing policies and plans in the health sector in Bangladesh.
- To review the current progress and issues of HPNSDP.

#### **b. Issues and Challenges of the Health Sector**

- To review the issues and challenges in the areas of maternal, neonatal and child health, as a part of health system strengthening and planned JICA technical cooperation area.
- To review the current situation and issues and challenges in terms of deployment and utilization including operation and maintenance of health facilities and equipment.
- To review the current situation and outcome and issues of the past and on-going JICA cooperation.

#### **c. Details of the Preparatory Survey**

- To list up the possible activities from the planned activities of Operational Plans of HPNSDP and additional activities necessary to solve the identified issues.
- To select the activities (facilities, equipment and training) to be included in the Project based on a certain selection criteria which will be decided during the survey.
- To suggest the improvement of health facilities and the detailed list and specifications of equipment.
- To propose the implementation schedule of the Project, including the plans for obtaining environmental clearance and other necessary procedures.
- To propose the details of consulting services (TOR may include detail design, construction supervisions, procurement assistance, and so on).
- To estimate project cost.
- To analyze the economic / financial viability of the Project.
- To propose additional technical cooperation plans or technical assistance if necessary.
- To consider the possibility of introducing Japanese Technology in Bangladesh.

#### **d. Implementation Arrangement**

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- To review the capacity of the executing Operation Plan (OP)/ Management capacity.
- 
- e. Operation and Maintenance (O&M) Arrangement
  - To examine the necessary O&M plans including the necessary fund.
  - To propose the necessary O&M structure for the Project implementation
- f. Environmental and Social Considerations
  - To assess the environmental and social impacts of the Project and prepare the mitigation measures and monitoring plan in accordance with the requirements of Bangladesh environmental law and regulations and JICA's "Guideline for Environmental and Social Considerations " (April, 2010).
  - To prepare draft environmental and resettlement framework in accordance with the requirements of Bangladesh law and regulations as well as JICA "Guidelines for Environmental and Social Considerations" (April, 2010).
  - To prepare Draft Resettlement Action Plan (RAP), Draft Initial Environmental Evaluation (IEE) and Draft Environmental Impact Assessment (EIA) for the two representative sub-projects in accordance with the environmental and resettlement framework.
- g. Evaluation of the Project
  - To propose operation and effect indicators and monitoring plan.
  - To collect baseline data of operation and effect indicators.
  - To evaluate the quantitative and qualitative effects of the Project.

2. Desirable specialists for the Preparatory Survey

JICA will select and dispatch a survey team to carry out the Preparatory Survey. The team will include the specialists in the following areas of health services:

- MNCH
- Human Resources for Health
- Hospital Service Delivery
- Medical Facility Planning
- Medical Equipment
- Economic and Financial Analysis
- Environmental and Social Consideration

The assignment of the specialists may be subject to change. The Survey team may engage local consultants, NGOs, and/or other supporting staffs.

#### **IV. SCHEDULE OF THE PREPARATORY SURVEY**

The Preparatory Survey will be carried out in accordance with the tentative schedule shown below. The schedule may be subject to change during the preparation and the course of the survey.

Tentative Schedule

Calendar Year	2014											2015	
Month	3	4	5	6	7	8	9	10	11	12	1	2	
Survey in Japan	<input type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
Survey in Bangladesh													
Reports	▲ IC/R		▲ IT/R				▲ IT/R2		▲ DF/R			▲ F/R	

IC/R: Inception Report, IT/R: Interim Report, DF/R: Draft Final Report, F/R: Final Report

#### **V. REPORTS**

JICA will prepare and submit following reports in English to GOB.

1. Inception Report:  
12 copies will be submitted at the commencement of the first survey period in Bangladesh.
2. Interim Report:  
12 copies will be submitted about 2 months after the commencement of the Preparatory Survey.
3. Interim Report 2:  
12 copies will be submitted about 5.5 months after the commencement of the Preparatory Survey.
4. Draft Final Report:  
12 copies will be submitted about 9 months after the commencement of the Preparatory Survey. GOB shall submit its comments within 2 weeks after the receipt of the Draft Final Report.
5. Final Report:  
12 copies will be submitted at the end of the study reflecting the comments on the Draft Final Report.

#### **VI. UNDERTAKINGS OF THE GOVERNMENT OF BANGLADESH**

1. The Ministry of Health and Family Welfare shall act as a counterpart agency to the survey team and also as a coordinating body with all departments/divisions of Ministries concerned for the

smooth implementation of the Preparatory Survey.

2. GOB shall, at its provide the survey team with the following items in cooperation with other organizations concerned:
  - (1) security-related information as well as measures to ensure the safety of the survey team;
  - (2) information as well as support in obtaining medical service;
  - (3) data and information related to the Preparatory Survey;
  - (4) counterpart personnel;
  - (5) credentials or temporary identification cards;
  - (6) entry permits necessary for the survey team members to conduct field surveys;
  - (7) support in making transportation arrangements; and
  - (8) support in obtaining other privileges and benefits if necessary.
3. GOB, in accordance with its rules and procedures, shall assist the team in custom clearance, exempt from any duties with respect to equipment, instruments, tools and other articles to be brought into and out of GOB in connection with the implementation of the survey.
4. GOB, in accordance with its rules and procedures, shall bear claims, if any arises, against the members of the survey team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in implementation of the Preparatory Survey, except when such claim arise from gross negligence or willful misconduct on the part of the member of the survey team.

## **VII. CONSULTATION**

JICA and the GOB shall consult with each other in respect of any matter that may arise from or in connection with the Preparatory Survey.

## **VIII. INFORMATION DISCLOSURE**

The JICA's policy of information disclosure is as follows:

1. Based on the Information Disclosure Law of Japan, JICA has a policy to disclose information to the public. However, confidential information will be kept undisclosed, such as purely personal information, bidding information to secure fairness of tender procedures and other issues to be mutually agreed.
2. Under the policy, the final report will be disclosed excluding confidential information to the public as soon as possible.

JICA and GOB agreed that such information related to bidding for procurement of goods and services such as cost estimate, B/Q, TOR and person-months should be kept confidential until a relevant contract agreement is concluded.

Other information which GOB requests to keep undisclosed, if any, will be so kept based on the mutual agreement between GOB and JICA. GOB agreed to submit a list of such information, if

any, together with timing of disclosure to JICA by the time of the draft final report submission.

## **IX. OTHERS**

GOB and JICA both agreed to resolve mutually any issue arising out during implementation of preparatory survey.

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## THE MAIN POINTS DISCUSSED

JICA and GOB agreed on the following three points in addition to the points described in the Appendix 1.

### 1. Contents of the Project

The contents (sub-projects) of the Project will be identified through the Preparatory Survey based on the following basic understandings which are agreed between JICA and the Ministry of Health and Family Welfare during the visit of JICA mission team in July 2013.

- a) Although the main focus of the project continues to be maternal, neonatal and child health (MNCH) related activities, activities whose primary objectives are not MNCH can also be included if they are in some way related to MNCH (e.g. health system strengthening).
- b) Activities under 5 Operational Plans (OP) which are currently utilizing the yen loan under the Project (Phase 1) will continue to be included, namely, Maternal Neonatal Child and Adolescent Health, Community Based Health Care, Maternal Child Reproductive and Adolescent Health, Physical Facilities Development and Hospital Service Management.
- c) Activities under OPs other than these five can also be included based on the needs and priorities.
- d) Although the current OPs include the plans for the entire five year period of HPNSDP, they need to be reviewed and updated since they were drafted at the time of the formulation of HPNSDP. Subprojects of the Project (Phase 2) will be identified through reviewing the current OPs and covering new activities and post-HPNSDP period if necessary.
- e) The subprojects which are categorized as 'Category A' (significant environmental or social impact) under JICA Guidelines for Environmental and Social Considerations (April 2010) will not be included.
- f) The subprojects which utilize Japanese technologies or know-how, such as advanced medical equipment or devices produced by Japanese companies, can be included based on the needs and availability of such technologies.

### 2. Period of the Project

As agreed during the visit of above mentioned JICA mission team, the Project will cover the latter half of HPNSDP (mainly FY2014/15-2015/16) and also beyond that time period to meet the further demands.

### 3. Japanese Technology

GOB requested JICA to make an opportunity (i) to hold workshop in Bangladesh and (ii) to go to Japan to observe Japanese technologies and know-how related to the Project during the period of the study. JICA has responded positively to this request.

4. Other: GOB and JICA confirmed that GOB expressed the intention of making an official request to the Government of Japan for financing the Project after scrutinizing outcomes and recommendations of the Preparatory Survey.

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## Annex 2: TOR of the Survey

### CHAPTER 1 Outline of the Preparatory Survey

#### 1.3.2: Terms of Reference

The survey covered the following items:

(1) Background and Necessity of the Project

- To review existing policies and plans in the health sector in Bangladesh
- To review the current progress of and issues with HPNSDP 2011-2016

(2) Issues and Challenges of the Health Sector

- To review issues with and challenges in the areas of maternal, neonatal, and child health, as part of health system strengthening and planned JICA technical cooperation
- To review the current situation, issues, and challenges with regard to deployment and utilization, including operation and maintenance of health facilities and equipment
- To review the current situation, outcome, and past issues regarding ongoing JICA cooperation

(3) Details of the Preparatory Survey

- To compile a list of possible activities from the planned activities of the Operational Plans of HPNSDP 2011-2016 and additional activities necessary to solve identified issues
- To select activities (facilities, equipment and training) to be included in the project based on selection criteria to be decided during the survey
- To suggest improvements to health facilities and a detailed list of sub-projects and equipment specifications
- To propose an implementation schedule for the project, including plans for obtaining environmental clearance and other necessary procedures
- To propose the details of consulting services (TOR may include detail design, construction supervisions, procurement assistance, and so on)
- To estimate project cost
- To analyze the economic/financial viability of the project
- To propose additional technical cooperation plans or technical assistance if necessary
- To consider the possibility of introducing Japanese technology in Bangladesh

(4) Implementation Arrangement

- To review the capacity of the executing Operational Plan (OP)/Management capacity

(5) Operation and Maintenance (O&M) Arrangements

- To explore necessary O&M plans, including vital funds
- To propose a necessary O&M structure for project implementation

(6) Environmental and Social Considerations

- To assess the environmental and social impact of the project and prepare mitigation measures and monitoring plans in accordance with the requirements of Bangladeshi environmental laws and regulations and JICA's "Guidelines for Environmental and Social Considerations" (April, 2010)
- To prepare and draft environmental and resettlement frameworks in accordance with the requirements of Bangladeshi laws and regulations as well as JICA's guidelines for the above.
- To prepare a Draft Resettlement Action Plan (RAP), Draft Initial Environmental Evaluation (IEE), and Draft Environmental Impact Assessment (EIA) for the two representative sub-projects in accordance with the environmental and resettlement framework

(7) Evaluation of the Project

- To propose operation and effect indicators and a monitoring plan
- To collect baseline data of operation and effect indicators
- To evaluate the quantitative and qualitative effects of the project



## Annex 3: Field Survey Schedule

### The First Field Survey

The First Field Survey Schedule										
S/N	Date	Day	Survey Team Members							
			Team leader/ Health Service	Deputy leader/ Health Service	MNCH	Human Resource for Health	Hospital Service Management	Medical Facility Planning 1	Medical Facility Planning 2	Medical Equipment
	Assignment		10	40	9	24	30	15	21	30
1	05-04-2014	Sat		KIX>DAC				HND>DAC		HND>DAC
2	06-04-2014	Sun		Meeting at JICA				Meeting at JICA		Meeting at JICA, Agent
3	07-04-2014	Mon		Logistics			KIX>DAC	MCHTI		MCHTI
4	08-04-2014	Tue		DMCH			DMCH	DMCH		DMCH
5	09-04-2014	Wed	HND>DAC	BSMMU	KIX>DAC		BSMMU	BSMMU		BSMMU
6	10-04-2014	Thu	Meeting at JICA	Meeting at JICA	Narsindi DH		Narsindi DH	Narsindi DH		Narsindi DH
7	11-04-2014	Fri	Team meeting	Team meeting	Team meeting		Team meeting	Team meeting		Team meeting
8	12-04-2014	Sat	Data compiling	Data compiling	Dhaka to Chittagong		Dhaka to Chittagong	Dhaka to Chittagong		Dhaka to Chittagong
9	13-04-2014	Sun	Meeting at JICA JICA-C/P meeting	Meeting at JICA JICA-C/P meeting	Chittagong MCH	KIX>DAC	Chittagong MCH	Chittagong MCH	HND>DAC	Chittagong MCH
10	14-04-2014	Mon	Preparation IC/R, DMCH	Preparation IC/R, DMCH	Data compiling	Preparation IC/R, DMCH	Data compiling	Data compiling	Preparation IC/R, DMCH	Data compiling
11	15-04-2014	Tue	IC/R meeting, Faculty of Nursing at BSMMU	IC/R meeting, Faculty of Nursing at BSMMU	CS Chittagong, Chittagong GH, Chittagong to Dhaka	IC/R meeting, Faculty of Nursing at BSMMU	CS Chittagong, Chittagong GH, Chittagong to Dhaka	CS Chittagong, Chittagong GH, Chittagong to Dhaka	IC/R meeting, Faculty of Nursing at BSMMU	CS Chittagong, Chittagong GH, Chittagong to Dhaka
12	16-04-2014	Wed	FMAU, Internal Meeting	FMAU, Internal Meeting	DAC>BKK	Internal meeting	Internal meeting	Internal meeting	Internal meeting	Internal meeting
13	17-04-2014	Thu	DAC>BKK	JICA meeting, PMMU, Mohakhali Nursing University (Hostel)	BKK>KIX	JICA meeting, Mohakhali Nursing University (Hostel)	JICA meeting, Mohakhali Nursing University (Hostel)	JICA meeting, Mohakhali Nursing University (Hostel)	JICA meeting, Mohakhali Nursing University (Hostel)	JICA meeting, Mohakhali Nursing University (Hostel)
14	18-04-2014	Fri	BKK>HND	Data compiling		Data compiling	Data compiling	DAC>BKK	Data compiling	Data compiling
15	19-04-2014	Sat		Team meeting		Team meeting	Team meeting	BKK>HND	Team meeting	Team meeting
16	20-04-2014	Sun		Meeting at CMSD		Preparation for field survey	Data compiling		Meeting at PWD	Meeting at CMSD
17	21-04-2014	Mon		Meeting at NEMEW		Preparation for field survey	DMCH		DMCH	DMCH, NEMEW
18	22-04-2014	Tue		Meeting at MIS		MCHTI	MCHTI		Meeting at PWD	MCHTI
19	23-04-2014	Wed		ICMH, Dhaka to Sylhet		ICMH, Dhaka to Sylhet	ICMH, Dhaka to Sylhet		ICMH, Dhaka to Sylhet	ICMH, Dhaka to Sylhet
20	24-04-2014	Thu		CS Sylhet, Sylhet MAG Osmani MCH, Shahid Shamsuddin DH		CS Sylhet, Sylhet MAG Osmani MCH, Shahid Shamsuddin DH	CS Sylhet, Sylhet MAG Osmani MCH, Shahid Shamsuddin DH		CS Sylhet, Sylhet MAG Osmani MCH, Shahid Shamsuddin DH	CS Sylhet, Sylhet MAG Osmani MCH, Shahid Shamsuddin DH
21	25-04-2014	Fri		Sylhet to Dhaka		Sylhet to Dhaka	Sylhet to Dhaka		Sylhet to Dhaka	Sylhet to Dhaka
22	26-04-2014	Sat		Dhaka to Rajshahi		Dhaka to Rajshahi	Dhaka to Rajshahi		Dhaka to Rajshahi	Dhaka to Rajshahi
23	27-04-2014	Sun		CS Rajshahi, Rajshahi MCH		CS Rajshahi, Rajshahi MCH	CS Rajshahi, Rajshahi MCH		CS Rajshahi, Rajshahi MCH	CS Rajshahi, Rajshahi MCH
24	28-04-2014	Mon		Paba UHC, Ghee Para CC, Rajshahi to Dhaka		Paba UHC, Ghee Para CC, Rajshahi to Dhaka	Paba UHC, Ghee Para CC, Rajshahi to Dhaka		Paba UHC, Ghee Para CC, Rajshahi to Dhaka	Paba UHC, Ghee Para CC, Rajshahi to Dhaka
25	29-04-2014	Tue		Meeting at HSM, Kurmitola GH		Kurmitola GH	Meeting at HSM, Kurmitola GH, Apollo Hospital		Meeting at HED, DoA, Local consultant, Kurmitola GH.	Meeting at HSM, CMSD, Kurmitola GH, Apollo Hospital
26	30-04-2014	Wed		BSMMU		Dhaka Shishu Hospital	BSMMU		Meeting at PWD, HED, Local consultant	Dhaka Shishu Hospital, Meeting at HMS
27	01-05-2014	Thu		Team meeting		Team meeting	Team meeting		Team meeting	Team meeting, Popular Hospital
28	02-05-2014	Fri		Data compiling		Data compiling	Data compiling		DAC>BKK	Meeting at agents
29	03-05-2014	Sat		Data compiling		Data compiling	Data compiling		BKK>HND	DAC>BKK
30	04-05-2014	Sun		DMCH		DMCH	DMCH			BKK>HND
31	05-05-2014	Mon		Logistics		DAC>BKK	DAC>BKK			
32	06-05-2014	Tue		Logistics		BKK>KIX	BKK>KIX			
33	07-05-2014	Wed		Meeting at HRM						
34	08-05-2014	Thu		Meeting at HSM						
35	09-05-2014	Fri		Meeting at JICA						
36	10-05-2014	Sat		Meeting with Local consultant						
37	11-05-2014	Sun		Meeting at UNICEF, CMSD, JICA						
38	12-05-2014	Mon		Meeting at KOICA						
39	13-05-2014	Tue		DAC>BKK						
40	14-05-2014	Wed		BKK>KIX						



## The Second Field Survey

The Second Field Survey Schedule												
S/N	Date	Day	Survey Team Members									
			Team Leader/Health Service	Deputy Leader/Health Service	MNCH	Operational Planning	Human Resource for Health	Hospital Service Management	Medical Facility Planning I	Medical Facility Planning2	Medical Equipment	Environmental Social Consideration
	Assignment	25	43	17	14	30	20	20	27	40	25	
1	10-06-2014	Tue		KIX>DAC			KIX>DAC					
2	11-06-2014	Wed		JICA			JICA					
3	12-06-2014	Thu		ITR1 Preparation			ITR1 Preparation					
4	13-06-2014	Fri		ITR1 Preparation			ITR1 Preparation	KIX>DAC				
5	14-06-2014	Sat	HND>DAC	Meeting with LC			ITR1 Preparation	Survey Preparation	HND>DAC			
6	15-06-2014	Sun	ITR1 Preparation	ITR1 Preparation			ITR1 Preparation	Survey Preparation	Decon(LC), PWD			
7	16-06-2014	Mon	ITR1 Preparation	HSM, CBHC LD			Dhaka MCH	Dhaka MCH	Decon		HND>DAC	
8	17-06-2014	Tue	ITR1 meeting, PFD LD	ITR1 meeting, PFD LD			Preparation of field trip, JICA	←	PFD LD, JICA		Agent, JICA	
9	18-06-2014	Wed	Meeting with LC	Meeting with LC	KIX>DAC		Preparation of field trip	←	Meeting with LC		Agent, Meeting with LC	
10	19-06-2014	Thu	BSMMU, Nursing Univ.	Preparation of field trip	BSMMU, Nursing Univ.		BSMMU, Nursing Univ.	←	BSMMU, Nursing Univ.		BSMMU, Nursing Univ.	
11	20-06-2014	Fri	Team meeting	Team meeting	Team meeting		Team meeting	Team meeting	Team meeting		Team meeting	
12	21-06-2014	Sat	DAC>BKK	DAC>Rangpur	←		DAC>Rangpur	←	←		DAC>Rangpur	KIX>DAC
13	22-06-2014	Sun	BKK>HND	Rangpur MCH, Nursing College	←		Rangpur MCH, Nursing College	←	←		Rangpur MCH, Nursing College DMEMW	Meeting with LC
14	23-06-2014	Mon		Rangpur>DAC, NES LD	←		Rangpur>DAC	←	←		Rangpur>DAC, Agent	Meeting with LC
15	24-06-2014	Tue		MCRAH LD	Manikganj DH		BSMMU	Manikganj DH	HED, BSMMU, PWD		Manikganj DH	Related Organization Visit
16	25-06-2014	Wed		DAC>Barisal	←		DAC>Barisal	←	←		DAC>Barisal	←
17	26-06-2014	Thu		Sher-e-Bangla MCH, Nursing College	←		Sher-e-Bangla MCH, Nursing College	←	←		Sher-e-Bangla MCH, Nursing College	←
18	27-06-2014	Fri		Barisal>DAC	←		Barisal>DAC	←	←		Barisal>DAC	←
19	28-06-2014	Sat		Team meeting	←		BJIRI	←	BSMMU, Decon		Team meeting	BSMMU
20	29-06-2014	Sun	HND>DAC	SDAM LD	Data compiling		Preparation of Training Plan	←	Facility Survey, JICA	HND>DAC, JICA	ESD LD, JICA	Related Organization Visit
21	30-06-2014	Mon	Chittagong MCH 11AM, Nursing 12-2PM	Data compiling	Gazipur DH		ICMH	←	PWD, Decon	←	Gazipur DH 10AM	Dhaka MCH
22	01-07-2014	Tue	JICA	LD MCRAH	Team meeting		Team meeting	DAC>BKK	HED	←	Team meeting	Team meeting
23	02-07-2014	Wed	JICA	DAC>Rajshahi Rajshahi MCH, Nursing College	Mymensign NC 11AM	HND>DAC JICA	Preparation of Training Plan	BKK>DAC	DAC>BKK	DOA, JICA	JICA	DAC>Rajshahi Rajshahi MCH, Nursing College
24	03-07-2014	Thu		Rajshahi>DAC	Data compiling	DOA, Meeting with LC	ICMH		BKK>HND	DHS, DOA, Decon	DNSLD, NEMEW	Rajshahi>DAC
25	04-07-2014	Fri	Team meeting	Team meeting	DAC>KIX	Team meeting	Team meeting			Team meeting	Team meeting	Team meeting
26	05-07-2014	Sat	F/F 1	Datacompiling		F/F 1	Datacompiling			Datacompiling	Datacompiling	Datacompiling
27	06-07-2014	Sun	Dhaka MCH, JICA	DAC>Khulna		Dhaka MCH, JICA	F/F 1			DAC>Khulna	F/F1	Meeting with LC
28	07-07-2014	Mon	F/F 1	Khulna MCH, Khulna>DAC		F/F 1	BSRI			Khulna MCH, Khulna>DAC	F/F1	MOE
29	08-07-2014	Tue	F/F 1	Meeting with LC		PWD, JICA	DAC>BKK			PWD, Decon	F/F1	Chittagong NC
30	09-07-2014	Wed	F/F 1, MOHFW	HSM LD		Facility Survey, Meeting with LC, JICA	BKK>KIX			Facility survey, Decon	HSM LD	MOE
31	10-07-2014	Thu	F/F 1, MNCAH LD	CBHC LD		F/F 1				Decon	F/F 1, MNCAH LD	Mymensign NC
32	11-07-2014	Fri	Team meeting	Team meeting		Team meeting				Team meeting	Team meeting	Team meeting
33	12-07-2014	Sat	Datacompiling	Datacompiling		Dhaka MCH & NC				Dhaka MCH & NC	Datacompiling	Datacompiling
34	13-07-2014	Sun	DAC>BKK	Dhaka NC Meeting with LC		PFD LD				PFD LD	Dhaka NC	Related Organization Visit
35	14-07-2014	Mon	BKK>HND	Meeting with LC		DAC>BKK				Decon	Agent, Skill labo	DAC>BKK
36	15-07-2014	Tue		PFD LD, DNS		BKK>HND				Decon	PFD LD, DNS	BKK>KIX
37	16-07-2014	Wed		HSM LD						Decon	NEMEW, HSM LD	
38	17-07-2014	Thu		Data compiling						Facility survey	Agent	
39	18-07-2014	Fri		Team meeting						Team meeting	Team meeting	
40	19-07-2014	Sat		Team meeting						Team meeting	Agent	
41	20-07-2014	Sun		Meeting with LC						Decon	HSM, Agent	
42	21-07-2014	Mon		DAC>BKK						Decon	CMSD LD	
43	22-07-2014	Tue		BKK>KIX						Private hospital, decon	MSH, Agent	
44	23-07-2014	Wed								Decon	Agent	
45	24-07-2014	Thu								DAC>BKK	DAC>BKK	
46	25-07-2014	Fri								BKK>HND	BKK>HND	

## The Third Field Survey (1)

The Third Field Survey Schedule (1)											
S/N	Date	Day	Survey Team Members								
			Team Leader/Health Service	Operational Planning	Human Resource for Health	Hospital Service Management	Medical Facility Planning2	Medical Equipment	Economic and Financial Analysis	Environmental Social Consideration	Project Coordinator
	Assignment	74	30	45	16	20	64	30	22	33	
1	25-08-2014	Mon							KIX>DAC		
2	26-08-2014	Tue							Meeting with LC		
3	27-08-2014	Wed							Reviewing CC		
4	28-08-2014	Thu							Revising IEE		
5	29-08-2014	Fri							Reviewing CC		
6	30-08-2014	Sat							Data Compiling		
7	31-08-2014	Sun							IEE Finalization		
8	01-09-2014	Mon			KIX>DAC				TOR Preparation		
9	02-09-2014	Tue			Logistics work				ESMS Preparation		
10	03-09-2014	Wed			Logistics work				DOE		
11	04-09-2014	Thu			Dhaka MCH				DGHS		
12	05-09-2014	Fri	HND>DAC		Data Compiling		HND>DAC	KIX>DAC	Data Compiling		
13	06-09-2014	Sat	Team Meeting		Team Meeting		Team Meeting	Team Meeting	Team Meeting		
14	07-09-2014	Sun	HSM LD, CBHC LD		FF2 Preparation		HSM LD, CBHC LD, Agent	Dhaka MCH, Local consultant	LD HSM, DAC>BKK		
15	08-09-2014	Mon	MCRAH LD, NES LD		FF2 Preparation		NES LD, Agent	Dhaka MCH	BKK>KIX		
16	09-09-2014	Tue	FF2, DGHS		FF2 Preparation		FF2 Preparation, Agent	Information Gathering			
17	10-09-2014	Wed	FF2, Dhaka MCH, DGHS		Dhaka MCH, Agent		Price guide workshop, DGHS, Agent	Dhaka MCH			
18	11-09-2014	Thu	FF2, MOHFW PW		MOHFW PW		MOHFW PW, MSH, Agent	Information Gathering			
19	12-09-2014	Fri	Team meeting	HND>DAC	Data compiling, Team meeting		HND>DAC	Data compiling, Team meeting	Data compiling, Team meeting		
20	13-09-2014	Sat	Team meeting	Team meeting	Team meeting		Team meeting	Team meeting	Team meeting		
21	14-09-2014	Sun	MOHFW PW	PWD	MOHFW PW		PWD	MOHFW PW	Information Gathering		
22	15-09-2014	Mon	HSM LD, Dhaka MCH, HSM LD, JICA	HSM LD, PWD	Dhaka MCH, BARIT		PWD, DOA	HSM LD, Dhaka MCH, FF2	Dhaka MCH		
23	16-09-2014	Tue	DGHS, JICA	DOA, NES	NEMEW		DOA, NES	DGHS (LD HSM)/ NEMEW	Information Gathering		
24	17-09-2014	Wed	DGHS , FF2	JICA, Shimizu Cooperation OC local office	Reviewing Training Plan	KIX>DAC	JICA, Shimizu Cooperation OC local office	DGHS/Agent	Information Gathering	KIX>DAC	
25	18-09-2014	Thu	JICA meeting	JICA meeting	Logistics work	JICA meeting	JICA meeting	JICA meeting	JICA meeting	Logistics work	
26	19-09-2014	Fri	Team meeting, Data compiling	Team meeting, Data compiling	Team meeting, Data compiling	Team meeting, Data compiling	Team meeting, Data compiling	Team meeting, Data compiling	Team meeting, Data compiling	Team meeting, Data compiling	
27	20-09-2014	Sat	Team meeting	Team meeting	IHT	IHT	Team meeting	Team meeting	Team meeting	Team meeting	
28	21-09-2014	Sun	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	
29	22-09-2014	Mon	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	JICA meeting, Team meeting	
30	23-09-2014	Tue	DGHS , FF2	DGHS , FF2	Dhaka MCH	Dhaka MCH	PWD, DOA	DGHS / FF2 /Invitation Program Preparation/Technical Seminal Preparation	Information Gathering	Losistics work/ Invitation Program Preparation	
31	24-09-2014	Wed	DGHS , FF2	DGHS , FF2	HRM LD	HRM LD	Decon	DGHS / FF2 /Invitation Program Preparation/Technical Seminal Preparation	Information Gathering	Losistics work/ Invitation Program Preparation	
32	25-09-2014	Thu	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	Meeting about Sub-project at DGHS	
33	26-09-2014	Fri	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	
34	27-09-2014	Sat	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	Team meeting, Data Compiling	
35	28-09-2014	Sun	DAC>BKK	DAC>BKK	Summary of training plan	Summary of training plan	Decon	DGHS	Information Gathering	Losistics work/ Invitation Program Preparation	
36	29-09-2014	Mon	BKK>HND	BKK>HND	Summary of training plan	Summary of training plan	Summary of Facility Plan	DGHS	Information Gathering	Losistics work/ Invitation Program Preparation	
37	30-09-2014	Tue			DGHS	Summary of training plan	DAC>BKK	DGHS	Information Gathering	Losistics work/ Invitation Program Preparation	
38	01-10-2014	Wed			Meeting with agents	DAC>BKK	BKK>HND	Meeting with agents	Information Gathering	Meeting with agents	
39	02-10-2014	Thu			DGHS	BKK>KIX		DGHS	Information Gathering	Losistics work/ Invitation Program Preparation	
40	03-10-2014	Fri			DAC>BKK			DAC>BKK	DAC>BKK	DAC>BKK	
41	04-10-2014	Sat			BKK>KIX			BKK>HND	BKK>KIX	BKK>KIX	
42	05-10-2014	Sun									
43	06-10-2014	Mon									
44	07-10-2014	Tue									
45	08-10-2014	Wed									
46	09-10-2014	Thu									
47	10-10-2014	Fri									
48	11-10-2014	Sat	HND>DAC								
49	12-10-2014	Sun	Wrap-up Mission								
50	13-10-2014	Mon	Wrap-up Mission								
51	14-10-2014	Tue	Wrap-up Mission								
52	15-10-2014	Wed	Wrap-up Mission								
53	16-10-2014	Thu	Wrap-up Mission								
54	17-10-2014	Fri	DAC>BKK								
55	18-10-2014	Sat	BKK>HND								

## The Third Field Survey (2)

The Third Field Survey Schedule (2)												
S/N	Date	Day	Survey Team Members									
			Team Leader/Health Service	Operational Planning	Human Resource for Health	Hospital Service Management	Medical Facility Planning1	Medical Facility Planning2	Medical Equipment	Economic and Financial Analysis	Environmental Social Consideration	Project Coordinator
69	01-11-2014	Sat	HND>DAC									
70	02-11-2014	Sun	Appraisal									
71	03-11-2014	Mon	Appraisal						HND>DAC			
72	04-11-2014	Tue	Appraisal	HND>DAC					Appraisal /Invitation Program Preparation			
73	05-11-2014	Wed	Appraisal, DGHS	Appraisal, PWD					Appraisal /Invitation Program Preparation			
74	06-11-2014	Thu	Appraisal, DGHS	Appraisal, PWD					Appraisal /Invitation Program Preparation			
75	07-11-2014	Fri	Team meeting	Team meeting					Team meeting			Invitation Program Preparation (Domestic)
76	08-11-2014	Sat	Team meeting Data compiling	Team meeting Data compiling					Team meeting Data compiling			Invitation Program Preparation (Domestic)
77	09-11-2014	Sun	Appraisal, DGHS	Appraisal, PWD					Appraisal /Invitation Program Preparation			Invitation Program Preparation (Domestic)
78	10-11-2014	Mon	Appraisal, DGHS	Appraisal, PWD	KIX>DAC Invitation Program Preparation				Appraisal /Invitation Program Preparation			Invitation Program Preparation (Domestic)
79	11-11-2014	Tue	Appraisal, DGHS	Appraisal, PWD	Appraisal /Invitation Program Preparation				Appraisal /Invitation Program Preparation			Invitation Program Preparation (Domestic)
80	12-11-2014	Wed	Appraisal, DGHS	Appraisal, PWD	Appraisal /Invitation Program Preparation				DAC>BKK			Invitation Program Preparation (Domestic)
81	13-11-2014	Thu	Appraisal, DGHS	Appraisal, PWD	Appraisal /Invitation Program Preparation				BKK>HND			Invitation Program Preparation (Domestic)
82	14-11-2014	Fri	DAC>BKK	DAC>BKK	DAC>BKK							Invitation Program Preparation (Domestic)
83	15-11-2014	Sat	BKK>HND	BKK>HND	BKK>KIX							Attending Invitation Program
84	16-11-2014	Sun	Attending Invitation Program		Supporting Invitation Program				Attending Invitation Program			Attending Invitation Program
85	17-11-2014	Mon	Attending Invitation Program		Supporting Invitation Program				Attending Invitation Program			Attending Invitation Program
86	18-11-2014	Tue	Attending Invitation Program		Supporting Invitation Program				Attending Invitation Program			Attending Invitation Program
87	19-11-2014	Wed	Attending Invitation Program		Supporting Invitation Program				Attending Invitation Program			Attending Invitation Program
88	20-11-2014	Thu	Attending Invitation Program		Supporting Invitation Program				Attending Invitation Program			Attending Invitation Program
89	21-11-2014	Fri										Accounts settlement of Invitation Program
90	22-11-2014	Sat										
91	23-11-2014	Sun										
92	24-11-2014	Mon										
93	25-11-2014	Tue										
94	26-11-2014	Wed										
95	27-11-2014	Thu										
96	28-11-2014	Fri										
97	29-11-2014	Sat										
98	30-11-2014	Sun										
99	01-12-2014	Mon										
100	02-12-2014	Tue							HND>DAC JICA		KIX>DAC JICA	
101	03-12-2014	Wed							DGHS, CMSD, Agents		DGHS, CBHC	
102	04-12-2014	Thu							DGHS, PWD, DOA, Agents		Decon	
103	05-12-2014	Fri							Data compiling		Data compiling	
104	06-12-2014	Sat	HND>DAC						Agents		Data compiling	
105	07-12-2014	Sun	Follow-up Mission, DGHS						DGHS, Agents		DAC>BKK	
106	08-12-2014	Mon	Follow-up Mission, DGHS				KIX>DAC		DGHS, Agents		BKK>KIC	
107	09-12-2014	Tue	Follow-up Mission, DGHS				PWD, DOA		DGHS, Agents			
108	10-12-2014	Wed	Follow-up Mission, DGHS				PWD, DOA		DGHS, Agents			
109	11-12-2014	Thu	Follow-up Mission, DGHS				DAC>BKK		DGHS, Agents			
110	12-12-2014	Fri	Team meeting				BKK>KIC		Team meeting			
111	13-12-2014	Sat	Team meeting Data compiling						Team meeting Data compiling			
112	14-12-2014	Sun	Follow-up Mission, DGHS						DGHS, Agents			
113	15-12-2014	Mon	Follow-up Mission, DGHS						DGHS, Agents			
114	16-12-2014	Tue	Team meeting Data compiling						Team meeting Data compiling			
115	17-12-2014	Wed	Follow-up Mission, DGHS						DGHS, Agents			
116	18-12-2014	Thu	MD, Follow-up Mission						DAC>BKK			
117	19-12-2014	Fri	DPP compiling						BKK>HND			
118	20-12-2014	Sat	DPP compiling									
119	21-12-2014	Sun	DPP compiling									
120	22-12-2014	Mon	DPP compiling									
121	23-12-2014	Tue	DPP compiling									
122	24-12-2014	Wed	DPP compiling									
123	25-12-2014	Thu	DAC>BKK									
124	26-12-2014	Fri	BKK>HND									

## The Fourth Field Survey

The Fourth Field Survey						
S/N	Date	Day	Deputy Leader/Health Service	Operational Planning	Medical Equipment	Project Coordinator
98	30-01-2015	Fri		HND>DAC		
99	31-01-2015	Sat	KIX>DAC	Decon	HND>DAC	KIX>DAC
100	01-02-2015	Sun	Preparation of DFR presentation, DGHS	Preparation of DFR presentation, DGHS	DGHS, Agents, Preparation of Equipment Seminar	Preparation of Equipment Seminar
101	02-02-2015	Mon	Preparation of DFR presentation	Preparation of DFR presentation	Agents, Preparation of Equipment Seminar	Preparation of Equipment Seminar
102	03-02-2015	Tue	DFR Presentation	DFR Presentation	DFR Presentation	DFR Presentation
103	04-02-2015	Wed	DFR Compiling	DFR Compiling	DFR compiling, Agnets	DFR compiling, Accounts processing
104	05-02-2015	Thu	DFR Compiling	DFR Compiling	DFR compiling, Agnets	DFR compiling, Accounts processing
105	06-02-2015	Fri	DFR compiling	DAC>BKK	DFR compiling	Accounts processing
106	07-02-2015	Sat	DAC>BKK	BKK>HND	DAC>BKK	DAC>BKK
107	08-02-2015	Sun	BKK>KIX		BKK>HND	BKK>KIX

#### Annex 4: Organizational Chart of MOHPW, DOA, PWD and HED

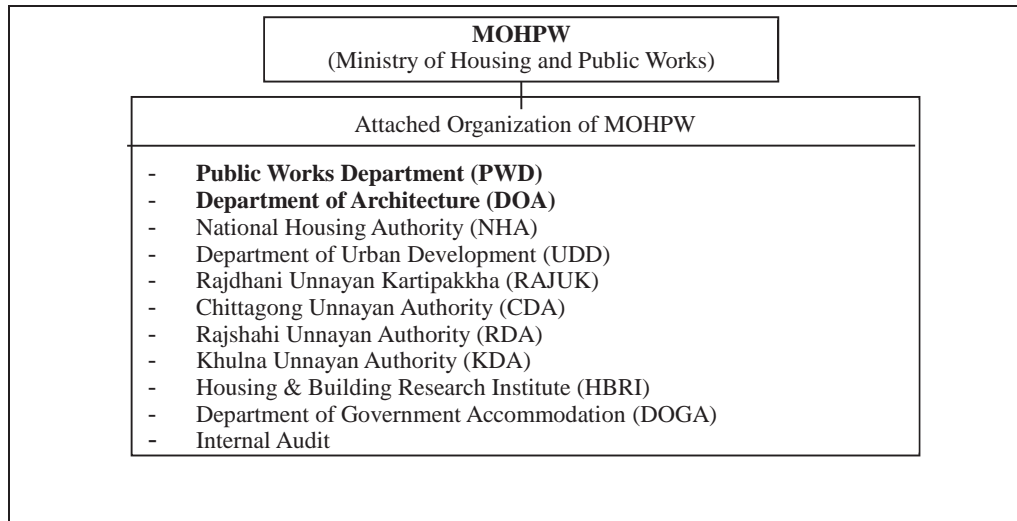


Figure A: Organizational Chart of MOHPW

Source: Prepared by the Survey Team based on the information provided by DOA

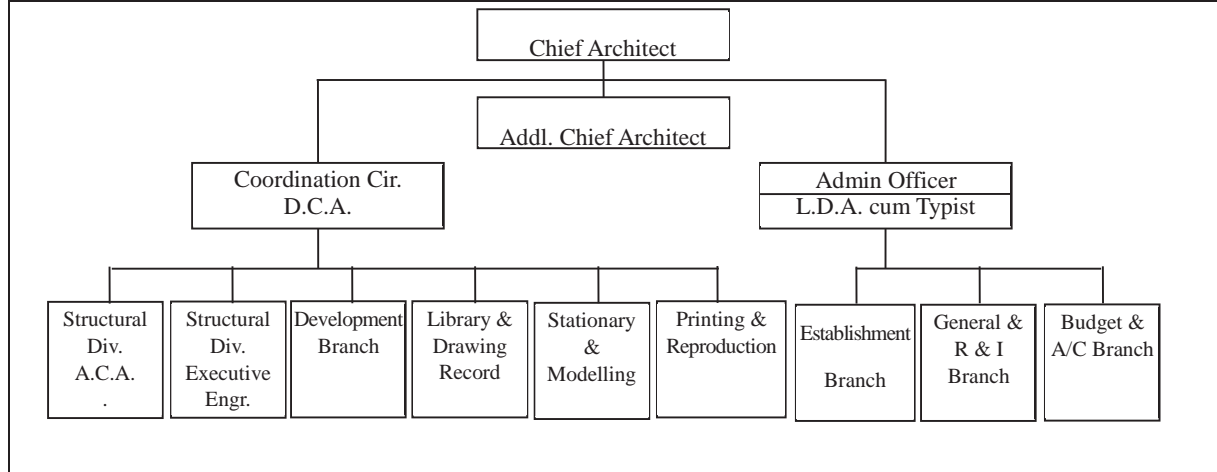


Figure B: Organizational Chart of DOA

Source: DOA website

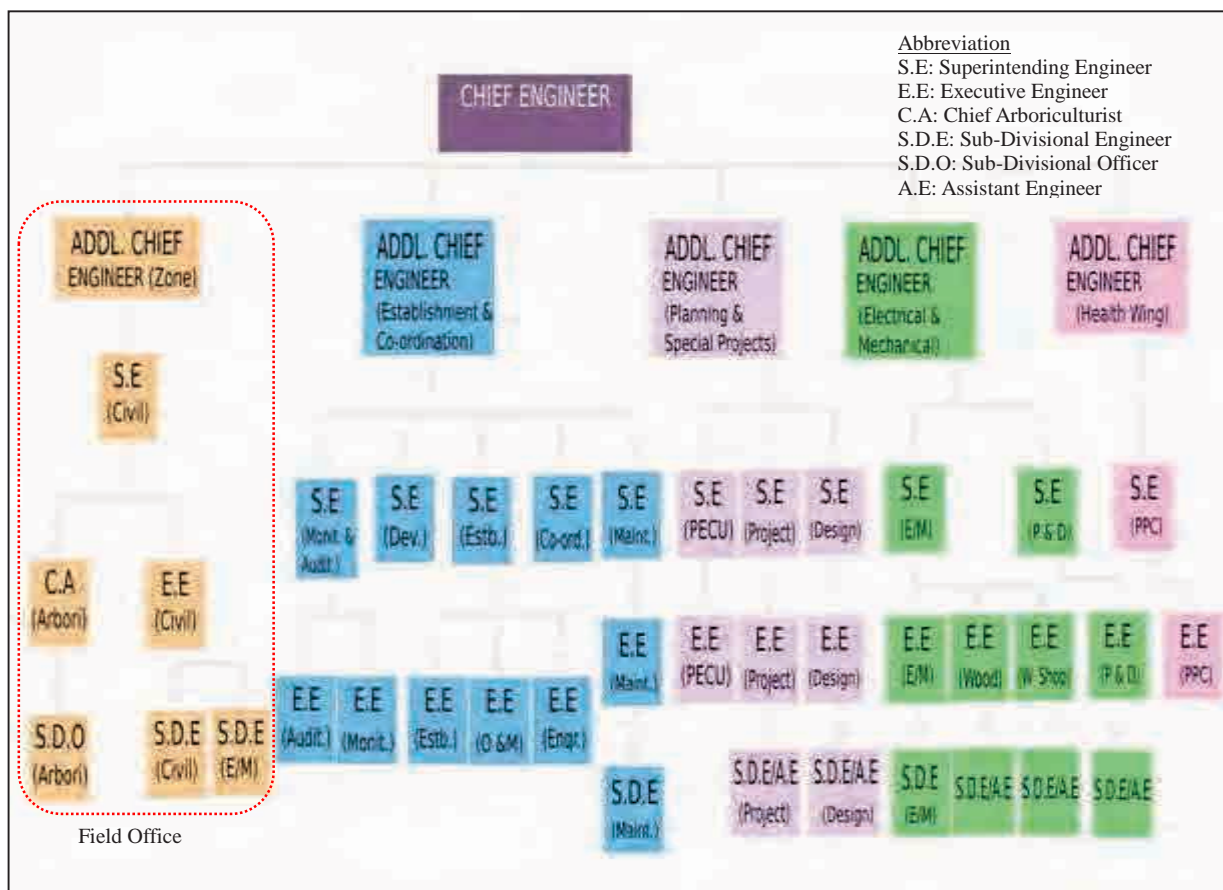


Figure C: Organization of PWD

Source: "A Brief Presentation of Works under MOHPW" (Health Wing/PWD)

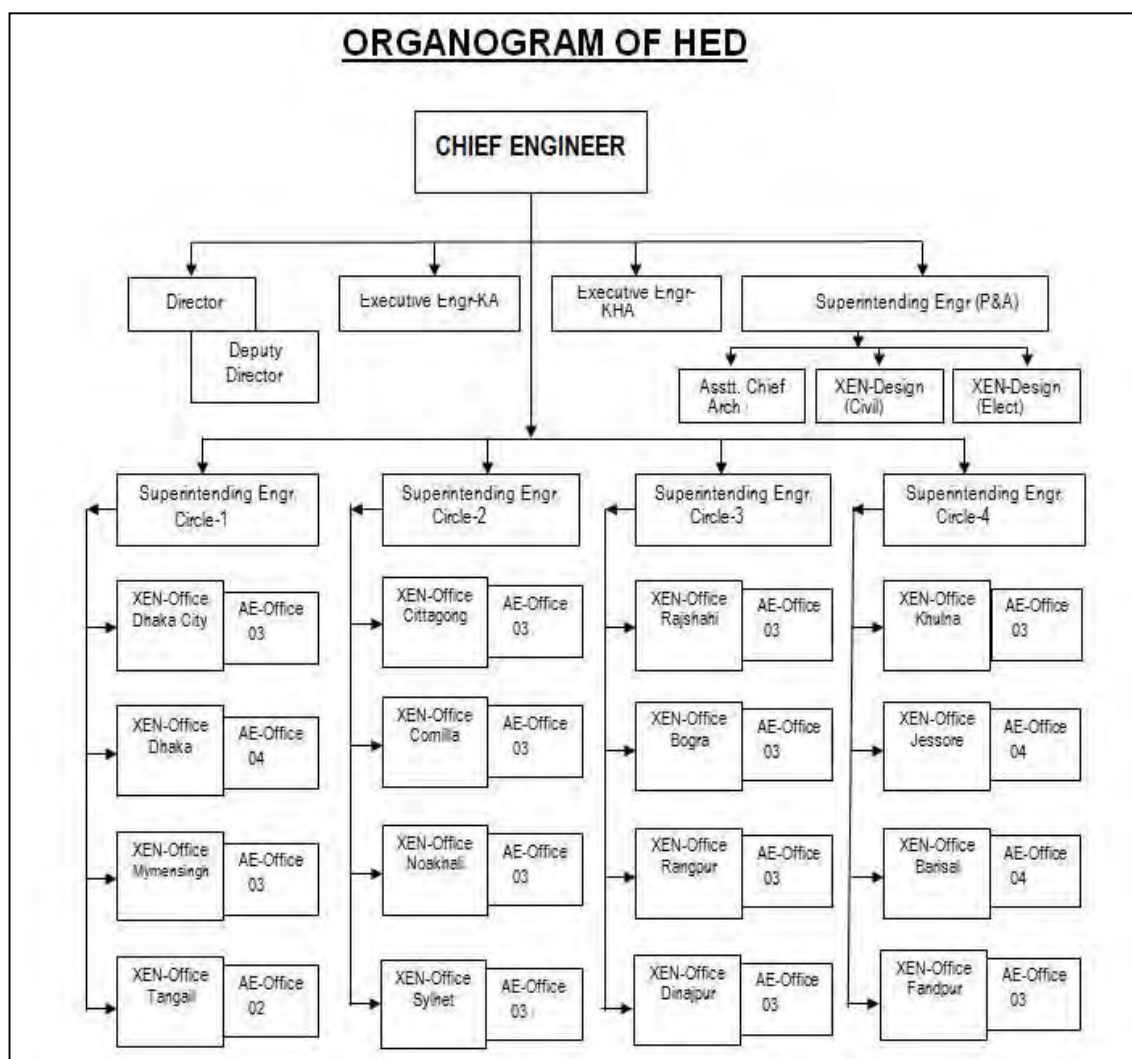


Figure D: Organizational Chart of HED

Source: HED website

## Annex 5: Type of Human Resources for Health and Medical Institution

Type of Human Resource for Health	Job Description	Type of Medical Institution	Duration of Course	Type of Degree	Discipline• Curriculum	No. of Institutions (No. of Seats)			Admission Requirement
						Gov.	Priv.	Total	
Doctor (Post-Basic)	Medical care & treatment for patients	•Medical College •Specialized Institute	Depends on the applied degree	MS, MD, Dip M.Phil, MPH, MTM, MMED	Postgraduate medical courses	23* (2068)	10 (169)	33 (2237)	MD/MS: Completion of 2 years after graduation (MBBS/or equivalent degree recognized by BMDC), under 45 years, FRCS/MRCP/MRCOG or FCPS. M. Phil, Dip, MPH: MBBS/or equivalent degree recognized by BMDC
Doctor (General)	Medical care & treatment for patients	Medical College	5 years + 1 year Internship	MBBS	Graduate Medical Degree (MBBS: Bachelor of Medicine and Bachelor of Surgery)	23 (2862)	64 (4850)	77 (7712)	HSC
Dentist	Medical care & treatment for patients	Dental College Medical College	5 years + 1 year Internship	BDS (Bachelor of Dental Surgery)	BDS (Bachelor of Dental Surgery)	9 (532)	18 (1065)	27 (1597)	HSC
Nurse	Nursing service (Medication, treatment, and state observation of patients etc.)	•Nursing College •Nursing Institute	3 years	Diploma	Diploma in Nursing Science and Midwifery	44 (2630)	47 (1910)	91 (7170)	HSC
			-	Specialized	-	-	4 (80)	4 (80)	-
			4 years	BSc	BSc in Nursing	9 (785)	13 (430)	22 (1215)	HSC, GPA (SSC&HSC total $\geq$ 6.0) or GPA (SSC&HSC in each) > 2.5
			2 years	Post BSc	•Bachelor of Sciences in Nursing •Bachelor of Sciences in Public Health Nursing,	4 (500)	10 (345)	14 (845)	Diploma holders with 2 years' clinical experience
Midwife	Midwife service at District or Upazila level, Instruction at local	•Junior Midwifery Institution •Nursing College	1.5 years	Junior Midwifery	-	-	12 (320)	12 (320)	-
		Nursing College	3 years	Diploma	Diploma in Midwifery	-	-	-	Under 35, GPA (SSC&HSC total $\geq$ 5.0) or GPA (SSC&HSC in each) > 2.5
		Nursing Institute	6 months	Post Midwifery Certificate	Post-basic Certified Midwife	-	-	-	Active midwife with 2 years' clinical experience
Medical Technologist	Exercise of technical & scientific functions in medical laboratories under the supervision of medical experts	IHT (Institute of Health Technology)	3 years	Diploma	Diploma in Medical Technology (LAB, RDL, PTY, SI, DENT, PHAR, RTY, FF&TR)	8 (2419)	82 (10231)	90 (12650)	SSC or equivalent exam (Physics, Chemistry & Biology), GPA minimum 2.5
			4 years	BSc	BSc in Medical Technology (LAB, PTY, DENT and Others)	3 (265)	-	3 (265)	Active technicians with Diploma and HSC holders
			4years + 2 years	BSc + MSc	Medical Technology (LAB, PTY, DENT)	-	15 (1160)	15 (1160)	Active technicians with Diploma and HSC holders
		Other Institutions	-	Certificate	Medical technology (Optometrist, refraction, Ophthalmic assistant, Ophthalmic Nursing assistant, Cathlab technology)	4 (180)		4 (180)	-



Type of Human Resource for Health	Job Description	Type of PSE Institution	Duration of Course	Type of Degree	Discipline • Curriculum	No. of Institutions (No. of Seats)			Admission Requirement
						Gov.	Priv.	Total	
Health Personnel for Alternative Medicines	Alternative medical care and services (i.e., unani, ayurvedic, and homeopathic)	Medical College	5 years + 1 year Internship	Bachelor	Unani Medicine and Surgery, Ayurvedic Medicine and Surgery	1 (50)	-	1 (50)	-
					Homeopathic Medicine and Surgery	1 (-)	1 (-)	2 (50)	-
		Diploma College	4 years + 6 months Internship	Diploma	Unani Medicine and Surgery, Ayurvedic Medicine and Surgery	1 (-)	19 (-)	20 (-)	-
					Homeopathic Medicine and Surgery	-	41 (-)	41 (-)	-
CSBA (Community-based skilled birth attendant)	Midwife service at local level, HA & FWA work	•CSBA Training Institution, •FWV Training Institute	6 months training 9 months practice 3 months follow up	-	6 months of training on BEmOC and ENC (Essential Newborn Care) + at least 9 months supervised work experience	45(-)	2(-)	47	FWA or Female Health Assistant
SACMO (Sub-Assistant Community Medical Officer) *	Primary health care at local level	MATS	3 years	-	3 years of training on treatment of common disorders	8 (716)	103 (6105)	111 (6821)	SSC
HA (Health Assistant)	Vaccination	District Training Institution	3month 6 months	-	3 months of training on limited preventive and curative care, immunization	-	-	-	SSC
FWV (Family Welfare Visitor)	Midwife service at local level	FWV Training Institution	30 days - 18 months	-	18 months of training on MCH, family planning, and contraception + 6 months midwifery training for some	-	-	-	SSC
FWA (Family Welfare Assistant)	Family planning (Distribution of contraceptive device, enlightenment)	FWV Training Institution Local training Center	6 months	-	6 months on Family planning	-	-	-	SSC
CHCP (Community Health Care Provider)	Management of community clinic, Health information gathering at local level	Training at UHC Level	3 months	-	BEmOC and ENC + at least 9 months supervised work experience	-	-	-	HSC
FPI (Family Planning Inspector)	Domiciliary work at the ward or village level	-	-	-	-	-	-	-	-

※Including 1 autonomous government university

※SACMO is the current name of "Medical Assistant"

Source: Midwifery in Bangladesh In-depth country analysis (2011), Health Bulletin 2013 (Edited by Survey team)





# Annex 6: Main Information and Photos in Visited Seven MCHs

Dhaka	Sylhet
Year of Establishment	
Main Building-1 : 1946 Main Building-2 : Nov.2013	Main Building-1 : 1962 Main Building-2 : Planning
Number of Bed	
Main Building-1 : 1,700 beds Main Building-2 : 600 beds Others : 100 beds	Main Building-1 : 900 beds Main Building-2 : 500-600 beds ※Planning (out of HNSDP)
ANC and Paediatric Ward, Imaging Diagnosis Department	
 <p>(Main Building-1) :Temporary LDR room (Labour, Delivery, Recovery) Due to the on-going reconstruction, the LDR was temporarily relocated to the corridor area</p>	 <p>LDR room</p>
 <p>(Main Building-1) Postnatal care room-1. More than one patients share one bed as the bed occupancy rate exceeds the capacity. (Hospital ward-1)</p>	 <p>Postnatal care room</p>
 <p>(Main Building-1) LDR room under reconstruction. (Hospital ward-1)</p>	 <p>There are 4 incubators (1 made in Japan) for new-born babies weighing less than 1kg. 2 babies are hospitalized in this NICU.</p>

Dhaka	Sylhet
 <p>Main Building-2, Hospital ward-2</p>	 <p>Warmer &amp; Electro-phototherapy equipment, donated by UK aid and DFATD Canada (2012).</p>
 <p>Inside of hospital ward-2, elevator hall</p>	 <p>Play room for children inside the hospital</p>
 <p>(Main Building-1) X-ray room (Hospital ward-1)</p>	 <p>X-ray room Several equipments are installed in one room.</p>
 <p>X-ray room (Hospital ward-2)</p>	 <p>X-ray room</p>








Dhaka	Sylhet
 <p>(Main Building-2) Ultrasound room (Hospital ward 2)</p>	 <p>Ultrasound room 1</p>
 <p>(Main Building-1) Ultrasound room (Hospital ward 1)</p>	 <p>Ultrasound room - 2</p>
 <p>(Main Building-1)CT scanner and Control room (Hospital ward 1). In hospital ward 2, there is only a room with no equipment.</p>	 <p>CT scanner and Control room</p>
 <p>In front of MRI room (Hospital ward 1) In hospital ward 2, there is only a room with no equipment.</p>	 <p>MRI (permanent magnet) room with copper shield.</p>







Dhaka	Sylhet
	
Department of radiological imaging (2 stories building)	Angiography
	
Students' training for radiological diagnostic imaging	Operating theatre

Rajshahi	Chittagong
Year of Establishment	
Main Building-1 : 1965 Main Building-2 : Apr. 2013	Main Building : 1958 Laboratory : Apr. 2013
Number of Bed	
Main Building-1 : 550 beds Main Building-2 : 450 beds ※Planning (10 floors total, 4 floors in Phase-1)	Main Building : 1010 beds Laboratory : ※Planning (10 floors total, 7 floors finished)
ANC and Paediatric Ward, Imaging Diagnosis Department	
	
Delivery room (Hospital ward-1)	Delivery room









Rajshahi	Chittagong
 <p>(Main Building-1) Postnatal care room (Hospital ward-1)</p>	 <p>Postnatal care room</p>
 <p>(Main Building-1) Two – Five new-born babies in one bed. (Hospital ward-1)</p>	 <p>NICU. Divided into 3 levels but there is no control of air cleaning.</p>
 <p>Connecting passageway between Hospital ward 1 and 2.</p>	 <p>Appearance of laboratory ward</p>
 <p>Inside of hospital ward-2.</p>	 <p>Inside of laboratory ward. It is working except for the top floor which is under construction..</p>

Rajshahi	Chittagong
 <p>(Main Building-1) X-ray room (Hospital ward-1)</p>	 <p>X-ray room Almost all equipment is out of order.</p>
 <p>(Main Building-1) X-ray room (Hospital ward-1, equipment in the same room as above)</p>	
 <p>(Main Building-1) Ultrasound room (Hospital ward 1)</p>	 <p>Ultrasound room</p>
 <p>CT scanner</p>	 <p>CT scanner, Control room</p>

Rajshahi	Chittagong
 <p>MRI (permanent magnet) room with copper shield.</p>	 <p>MRI (permanent magnet) room with copper shield.</p>
 <p>In front of operating theatre</p>	 <p>Preparation hall for operating theatre. Maintenance of hygiene is suspicious.</p>
 <p>Operating theatre</p>	 <p>Operating theatre</p>

Source: Prepared by the Survey Team













Rangpur	Barisal
Year of Establishment	
Main Building-1 : 1970 Main Building-2 : under construction (10-story building)	Main Building-1 : 1968 Main Building-2 : The construction has been stopped.
Number of Bed	
Main Building-1 : 500 beds Main Building-2 : -	Main Building-1 : 500 beds Main Building-2 : -
ANC and Pediatric Ward, Imaging Diagnosis Department	
	
LDR room	LDR room
	
Entrance of SCANU	Gastro-Intestinal Fiber room
	
Waiting space for gynecology clinic	Neonatal ward

Rangpur	Barisal
 <p>New building for outpatient and operation</p>	 <p>Building for outpatient and operation (The construction has been stopped.)</p>
 <p>Inside of the hospital ward</p>	 <p>Inside of the hospital ward</p>
 <p>X-ray room</p>	 <p>X-ray room Several equipments are installed in one room.</p>

Rangpur	Barisal
 <p>X-ray room 2</p>	 <p>X-ray room 2</p>
 <p>Ultrasound room 1</p>	 <p>Ultrasound room 1 All machines need to be repaired.</p>
 <p>Ultrasound room – 2</p>	 <p>Senior doctor is reading films.</p>



Rangpur	Barisal
 <p>CT scanner room</p>	 <p>CT scanner room</p>
 <p>MRI room (View from Control room)</p>	 <p>MRI room</p>
 <p>Angiography</p>	 <p>Angiography (Newly installed)</p>
 <p>Students' training for radiological diagnostic imaging</p>	 <p>New CT scanner room(64 slice)</p>

Khulna	
Year of Establishment	
Main Building-1 : 1989	
Main Building-2 : To be applied	
Number of Bed	
Main Building-1 : 500 beds	
ANC and Pediatric Ward, Imaging Diagnosis Department	
	
	LDR room
	
	Pre/Postnatal care room with 35 beds
	
	Neonatal ward, there are 4 incubators and 3 infant warmers including 2 broken.

Khulna



Caesarean operation room



Play room for children inside the hospital



X-ray room with its control room



X-ray room

## Khulna



Ultrasound room 1



Ultrasound room 2



CT scanner room (16 slices)

There is no MRI installed.

There is no angiography installed.




Operating theatre






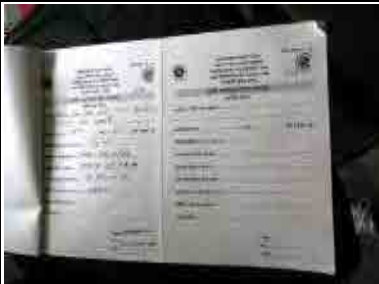
Source: Prepared by the Survey Team



Annex 7: Present Situation of DHs, UHC and CCs

DH in Sylhet	Paba / Rajshahi UHC	CC (Rajshahi)
Year of Establishment		
1948	-	-
Number of beds		
100 beds	31 beds	0 beds
Appearance		
 <p>One-story house</p>	 <p>Front: Existing building Back: New building (under construction)</p>	 <p>Constructed on the slope land.</p>
Inside of the building		
 <p>Under reconstruction (spandrel wall with tiles)</p>	 <p>Corridor and stairs connecting to the 1<sup>st</sup> floor</p>	 <p>Waiting room</p>
 <p>Consultation room (examination room)</p>	 <p>Operating theatre/ delivery room</p>	 <p>Consultation room (examination room)</p>



DH in Sylhet	Paba / Rajshahi UHC	CC (Rajshahi)
 <p>Ward for men (internal medicine and cancer). There are 37 beds. Few admitted patients due to the lack of doctors.</p>	 <p>Training</p>	 <p>Examination record</p>
 <p>In front of operating theatre</p>	 <p>New-born baby model</p>	 <p>Referral letter to relevant/related medical institutions</p>
ANC and Pediatric Ward, Imaging Diagnosis Department		
<p>There are five operating rooms, but are not being utilized due to shortage of doctors.</p>	<ul style="list-style-type: none"> <li>• Deal only with normal delivery (The number of home deliveries is greater than the number of hospital deliveries. UHC deals with only normal deliveries.).</li> <li>• There is an X-ray machine (three-phase), but it has been out of order since 2004.</li> <li>• No ultrasound apparatus</li> </ul>	<ul style="list-style-type: none"> <li>• The interior is made up of two rooms, the examination room and the waiting room.</li> <li>• There are diabetes diagnostic kits and a mobile height measurement instrument.</li> </ul>

Source: Prepared by the Survey Team

# Annex 8: Dhaka Nursing College and Hostel Building in Dhaka Medical College



Class room in Dhaka Nursing College



Practice in Skill Laboratory at Dhaka Nursing College



Female student hostel at Dhaka Medical College (1) (8 storied building, capacity of 100 students, completed in 2011)



Hostel (1): Rooms surrounding courtyard



Hostel (1): Double room (2.4m\*3.3m) Example-1



Hostel (1): (2.4m\*3.3m) Example-2



Hostel (1): Double room, example 3 (Slightly bigger than example 1 and 2). There are also rooms for 3-4 people.



Hostel (1): Communal toilet and shower room (3 of each)



Female student hostel at Dhaka Medical College (2) (Capacity of 200 students)



Hostel (2): Very dark rooms facing the middle corridor and located in both sides



Hostel (2): Double room, Example-1



Hostel (2): Double room, Example-2



Hostel (2): Communal toilet and shower room

Source: Prepared by the Survey Team

## Annex 9: Results of the Filed Survey on MCHs and DHs

### 1. SHER-E-BANGLA MEDICAL COLLEGE HOSPITAL, BARISAL

Date of survey: 26/06/2014

#### At a glance

#### (1) Basic Information

Level	Tertiary
Division	Barisal
Population in division	8,489,476
Year of established	1968
No. of beds	500
No. of OPD	354,069
No. of Emergency	84,747
No. of admission	78,690
Bed Occupancy Rate (%)	100.00

Source: Local Bulletin 2013



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	Assault by blunt object, home	3.90%	1	Chronic obstructive pulmonary disease with acute exacerbation, unspecified	7.10%
2	Acute transmural myocardial infarction of anterior wall	3.67%	2	Intracerebral haemorrhage in hemisphere, unspecified	6.74%
3	Superficial injury of scalp	3.29%	3	Birth asphyxia, unspecified	5.69%

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	-	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	-
Gastroenterology	○	Ophthalmology	○	Urology	○

#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

Source: Interview with Director of the Hospital

## 2) Human resources

Job	Sanctioned	Filled	Comments
Physician	205	175	
Nurse	324	304	
Medical Assistant	0	0	
Medical Technologist	27	24	

Source: Local Bulletin 2013

## 3) Medical waste management (Observation)

Availability of Incinerator	Not available
Separation of wastes	Not separated
Process of waste disposal	City corporation collects the medical waste.



## By Department

### (1) Radiology and Imaging

#### 1) List of Equipment

S/N	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	x-ray machine(100 mA)	1	Ascot	T3090/SMAM 20053muggio	1998	Portable
2	x-ray machine(500 mA)	1	Medicore-Budapest		1978	
3	Dental X-ray	1	IMS-Italy	65kvp8mA520vA	2006	not used for 2 yrs
4	Spiral CT scan	1	Siemens	Somatom Emotion	2003	single slice
5	Spiral CT scan	1	Philips	SFDA20123301991 YZB/USA2974-2011	2014	64 slice
Additional equipment						
6	Laser Printer	2	Fujifilm	Dry pix1000	2003	
7	Laser Printer	1	Kodac-carestream	Dry view6850	2014	
8	Teal-TPE1	1	Mexico	ISO-TRANLM	2014	
9	Auto injector	1	Liebel-Flarsheim	MallinckRodd optivantage DH	2014	

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	General X-Ray Machine	-	33,110	33,340	35,360	37,000	
2	CT Scan	-	4,268	4,400	4,780	5,029	
3	MRI Machine	-	-	-	130	140	Not functioning for last 3 month
4	Ultrasound	-	5,098	5,894	6,087	4,960	Not functioning for last 4 month

#### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	General X-Ray Machine	CXR	X-ray WA	X-ray L/S	X-Ray PNS	Others	
		50%	10%	20%	10%	10%	
2	CT Scan	Brain	Abdomen	Chest	Others		
		80%	10%	5%	5%		
3	MRI Machine	L/S	Cervical spine	Brain	Others		Not functioning for last 3 months
		40%	20%	30%	10%		
4	Ultrasound	USG of WA	USG of pregnancy profile	USG of HBS	Others		Not functioning for last 4 months
		30%	50%	10%	10%		

#### 4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No shield except wall thickness	Yes	Yes	No	No	No shield over the ceiling.
2	MRI	Magnetic Protected	Yes	Yes	Yes	No	
3	CT scan	No shield except wall thickness	Yes	Yes	Yes	No	No shield over the ceiling.
4	Ultrasound	No shield except wall thickness	Yes	Yes	Yes	No	No shield over the ceiling.

#### 5) Comments (Findings from Observation and Interview)

The department of Radiology of Sher-e-Bangla medical college, Barisal has got no ultrasonogram machine working currently. Following 3 machines are repairable which are stored at the ultrasonogram room at 2<sup>nd</sup> floor, radiology department:

No.	Manufacture	Model	Product year
1	Fukuda	UF 870AG	2005
2	Landwino-China	SSI5000	2010
3	Landwino-China	SSI5000	2010

Among these the Chinese machines do not work satisfactorily. Department of radiology has no more than one year warranty in any equipment. They have to apply for repairing to the government. It takes long time for the government engineers to come and repair the instruments. The ultrasonogram machines have been not functioning in last two years one by one. Before this they used to do approximately 20,000-30,000 ultrasonography per year.

There are only two x-ray machines and lots of patients. The machines are very old.

#### (2) Gastroenterology

##### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Gastroscope	1	Pentax	EPK-1000 and A120630	2009	
2	Colonoscope	1	Pentax	EPK-1000 and A120411	2009	
3	Fibroscan machine	2	Echosens, KNS-Canada	FS402	2014	

##### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Gastroscope			950	1,100	1,200	
2	Colonoscope			150	180	200	

##### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Gastroscopy	PUD	Ca stomach	Gastritis	Ca esophagus	Others	
		40%	30%	20%	5%	5%	
2	Colonoscopy	Ca colon	Polyp	Ulcer, Erythema	Hemorrhoids	Others	
		40%	15%	20%	15%	10%	

4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Gastroscopy	Congested	Average	Yes	Yes	Yes	
2	Colonoscopy	Congested	Average	Yes	Yes	Yes	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	N/A	N/A	N/A	N/A
2				

(3) Cardiology (Cath-Lab)

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Angiogram Machine	1	Philips	XPER FD-10	2014	Installation going on

2) Comments (Findings from Observation and Interview)

Installation of a new machine is ongoing.
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## 2. CHITTAGONG MEDICAL COLLEGE HOSPITAL

Date of survey: 30/06/2014 - 02/07/2014

### At a glance

#### (1) Basic Information

Level	Tertiary
Division	Chittagong
Population in division	27,163,631
Year of established	1957
No. of beds	1010
No. of OPD	527,130
No. of Emergency	N/A
No. of admission	127,612
Bed Occupancy Rate (%)	187.20%

Source: CMCH website, Census 2011



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	N/A		1	N/A	
2	N/A		2	N/A	
3	N/A		3	N/A	

Source:

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	-	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	○
Gastroenterology	○	Ophthalmology	○	Urology	○

#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
Total	Not Collected	315,50,00,000/-	350,00,00,000/-
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
Total	Not Collected	299,65,45,810/-	Not Collected

Source: Interview with Director of the Hospital

##### 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician	222	173	
Nurse	442	228	
Medical Assistant	0	0	
Medical Technologist	71	15	

Source: Organization Registry 2013

### 3) Medical Waste Management (Observation)

Availability of Incinerator	No
Separation of wastes	Yes
Process of waste disposal	Wastes are separated in different colored plastic drum in different wards. From there it is collected by sweepers allocated by the hospital & then it was shifted to city corporation waste management van that comes to the hospital each day. City corporation staff dumped those as garbage along with household and general waste material.

## By Department

### (1) Radiology and Imaging

#### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray machine 200mA	1	China	TR-200B	2014	
2	X-ray machine 500mA	1	Korea	Dong-A	1995	
3	X-ray machine 500mA	2	Korea	Listem S/N-004	2005	
4	X-ray machine Digital	1	Fusion		2013	
5	X-ray machine Portable 500mA	2	France	Ascot-SMAN	1999	
6	Spiral CT Scan(single slice)	1	Toshiba	TSX-021B/IV	2004	
7	MRI machine(0.3 T)	1	Hitachi	AIRIS-11	2005	
8	USG machine	1	Fujifilm	M-turbo	2014	
		1	China	Haiying HV-5566		
		1	China	Haiying HV-5566		
9	Mammography	Not available	-	-	-	

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	MRI				700	720	
2	CT scanner		1,490	1,500	1,600	1,605	
3	General X-ray	35,000	36,000	36,500	45,500	48,921	
4	USG	4,200	4,500	5,900	6,350	6,887	
5	Mammography		-	-	-	-	N/A

Source: Mr.Sadek, Head Technician, Radiology Department, CMCH. Statistics of 2013is given as actual numbers

Radiology & Imaging Department  
Chittagong Medical College Hospital

Month (2013)	X-Ray		Total Patient	USG		Total Patient	CT Scan		Total Patient	MRI		Total Patient
	Paying	Free		Paying	Free		Paying	Free		Paying	Free	
January	3152	330	3482	338	108	446	77	-	77	55	17	72
February	2956	258	3214	347	99	446	75	5	80	44	11	55
March	3276	264	3540	403	110	513	85	1	86	53	1	54
April	3491	301	3792	503	84	587	144	27	171	66	2	68
May	3520	239	3759	539	94	633	147	3	150	51	9	60
June	3561	246	3807	515	85	600	151	2	153	55	13	68
July	3896	280	4176	582	77	659	116	4	120	52	9	61
August	3741	280	4021	414	77	491	102	1	103	13	7	20
September	4668	397	5065	625	102	727	151	5	156	70	9	79
October	5644	376	6020	453	63	516	118	6	124	51	5	56
November	3977	349	4326	573	61	634	198	7	205	54	11	65
December	3411	308	3719	536	99	635	174	6	180	55	7	62

\*\*\*Actual data provided by the radiology department, CMCH.

3) Numbers of patients examined by Type of test/Main Diagnosis (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	MRI	L/S Spine	Dorsal spine	Brain	Cervical Spine	MRCP	
		360	144	144	72	Not done	
2	CT Scan	Brain	Abdomen	Chest	Neck	PNS	
		1605	Not Done	Not Done	Not Done	Not Done	
3	General X-ray Machine	CXR	L/S spine	Shoulder	PNS	Others	
		19,568	9,784	7,339	7,338	4,892	
4	USG Machine	Whole Abdomen	Lower abdomen	Hepatobiliary system	KUB	Others	
		2,756	2,066	1,033	688	344	
5	Mammography						Not Available

4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	Yes	No	Yes	Yes	No	
2	MRI	Yes	No	Yes	Yes	No	
3	CT scan	Yes	No	Yes	Yes	No	
4	USG	-	-	-	Yes	Yes	
5	Mammography		-	-	-	-	Not Available

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist	-	08	
2	Technologist	-	10	

6) Comments (Finding from observation and Interview)

Since the establishment of CMCH, the radiology department has not improved much. The main problem is unavailability of skilled manpower and in some cases lack of manpower. Some machines (X-ray machines, MRI and CT) are too old to operate. Overall improvement of this facility is recommended.

(2) Gastroenterology

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Endoscopy/Colonoscopy	1	Olympus	Pantex EPK1000	2007	
2	ERCP	1	India	Allegerns HF-49R	2014	

PHOTOS:

	
Endoscope	Processor

2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Gastroscopy	650	700	675	750	1,056	
2	Colonoscopy	120	135	150	150	192	

3) Number of patients examined by type of test/main diagnosis (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Endoscopy	Gastritis	PUD	Varices	Ca. Stomach	Ca. Esophagus	
		360	288	276	96	36	
2	Colonoscopy	Hemorrhoid	Ulcer, Erythema	Ca. Colon	IBD	Polyp	
		60	48	36	24	24	

#### 4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Endoscopy	3 machines in a room	Moderately clean.	No	Yes	No	
2	Colonoscopy						
3	ERCP						

#### 5) Percentage of patient getting service (per month)

No.	Equipment	Investigation advised	Investigation done	Patient deprived
1	Endoscopy	210-230	60-70	70%
2	Colonoscopy	55-60	16-20	70%
3	ERCP	Not done	Not done	Not done

Source: Dr.Hamid, Resister, Gastroenterology Department, CMCH

#### 6) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Doctors	7	7	Assisting Endoscopy by a trained local person who is not a government employee
2	Technicians	0	0	
3	Sisters	-	2	

Source: Dr.Hamid, Resister, Gastroenterology Department, CMCH

#### 7) Comments (Findings from observation and interview)



During our visit in gastroenterology department, we observed that they have very small space for the instruments to operate. They have only one room for endoscopy, colonoscopy and ERCP. Their indoor patients were previously admitted in medicine ward-16 which is located just beside the endoscopy room. But recently they got a 22 bed ward in the newly constructed hospital wing, which is not at all adequate. So urgently they need more space to perform the investigations and interventions. The doctors are already performing all the tests in outside private hospital. They also do not have instruments like balloon dilatation probe, fibroscan which is available outside in private hospitals. If these requirements are fulfilled, they can give a better service in future.

#### (3) Cardiology (Cath-lab)

##### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Angiogram Machine	1	Siemens	Angiostar Plus	2000	

## Photos

	
Angiogram machine	Room of Angiography

## 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Angiogram Machine	625	600	650	650	697	

## 3) Number of patients examined by Type of test/Main diagnosis (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Angiogram	CAG	PTCA	PPM	PTMC	TPM	
		564	72	36	Not Done	25	

## 4) Condition of the room and patient care

No.	Equipment	Shield of the room	Cleanliness of the room	Console	Patient privacy	Waiting space	Comments
1	Angiogram Machine	Yes	Good	Yes	Yes	Yes	

## 5) No. of staff in the Cath-lab:

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Cardiologist		6	
2	Technologist		2	
3	Sister		2	

## 6) Comments (Findings from observation and interview)

Chittagong medical college was the first to introduce angiogram machine in this part of the country. but as time passes by, there is no improvement of this department. at this time many outside clinic there is new & more modern machines available. there is also severe manpower problem & technicians are lacking proper training. so more modern machines & skilled technicians are required to uphold the services of this department

## (4) Laparoscopic surgery

### 1) List of Equipment:

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Laparoscope	2	Storz, Germany	20113320 Halogen-250 Twin	2010 2011	

## Photos



## 2) Number of patients treated by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Laparoscopy					1500	

## 3) Number of patients treated by main diagnosis/department (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Laparoscope	Cholecystectomy	Appendectomy	Diagnostic	Others	-	
		750	450	225	75	-	

## 4) Condition of the OT room

No.	Equipment	Space	Cleanliness of the room	Sterilization	Recovery room	Remarks
1	Laparoscope	Adequate	Good	Good	Good	

## 5) Comments (Findings from observation and interview)

Chittagong Medical College Hospital has 4 OT rooms. 2 for surgery and 2 for OBGY. Rooms are well equipped and sisters & doctors are well trained. OTs follow proper sterilization technique and there is a well established sterilization room. OT rooms are being cleaned by fumigation on a regular basis. Overall is a satisfactory picture.



### 3. DHAKA MEDICAL COLLEGE HOSPITAL

Date of survey: 28/6/2014

#### At a glance

#### (1) Basic Information

Level	Tertiary
Location	Dhaka
Population in division	45,568,835
Year of established	1946
No. of beds	2,400
No. of OPD	634,655
No. of Emergency	589,229
No. of admission	95,319
Bed Occupancy Rate (%)	127.81

Source: Local Bulletin 2013



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	Intracranial injury, unspecified	5.85%	1	Unspecified Transport accident	16.94%
2	Stroke, not specified as haemorrhage or infarction	5.54%	2	Stroke, not specified as haemorrhage or infarction	14.16%
3	Toxic effect of pesticides	4.22%	3	Intracranial injury, unspecified	10.38%

Source: Local Bulletin 2013

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	○	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	○	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	-
Gastroenterology	○	Ophthalmology	○	Urology	○

#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

Source: Interview with Director of the Hospital

## 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician	298	271	
Nurse	656	624	
Medical Assistant	0	0	
Medical Technologist	98	87	

Source: Local Bulletin 2013

## 3) Medical waste management (Observation)

Availability of Incinerator	Not available
Separation of wastes	Separated by bin
Process of waste disposal	City corporation collects the medical wastes.

By Department

(1) Radiology and Imaging

1) List of Equipment

No	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray Machine(1000mA CR)	1	SIEMENS	AXIOM-ICONS-R100	2006	
2	X-ray Machine(1000mA ) CR	1	LISTEM(south korea)		2010	
3	X-ray Machine (1000mA) CR	1	HITACHI			
4	X-ray Machine (200mA) CR	1	LISTEM(south korea)			
5	X-ray Machine (500mA) CR	1	LISTEM(south korea)		2011	
6	X-ray Machine (1000mA) DR	1	HITACHI	YVB-3	2011	
7	X-ray Machine Portable (100mA)	1			2013	
8	USG Machine 2D	1	SONOACE	R5	2011	
9	USG Machine 4D	1	SIEMENS	R6	2011	
10	USG Machine 2D	1	PROSOUND ALOKA	R7	2011	
11	USG Machine 4D	1	HITACHI	R8	2011	
12	USG Machine 4D	1	ALPIONION		2014	
13	Dual Slice CT scanner (repairable)	1	SIEMENS	SOMATOM Emotion Duo	2005	
14	64 Slice CT scanner	1	HITACHI SCANARIA	KA- 11772101	2011	
15	Mammography	1	HOLOGIC LORAD-M-IV	B-115 4-000-0029	2011	
16	MRI-machine 0.3 Tesla	1	HITACHI type MR-WS-11	KR-11383402	2006	

2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	General X-ray Machine	58,232	57,840	59,910	58,432	59,511	
2	CT Scan	20,510	21,520	22,480	23,294	24,598	
3	MRI Machine	1,975	2,103	2,315	2,451	2,616	
4	USG	59,412	61,275	63,485	64,970	68,675	

Source: DMCH Statistics and Register

Comment: Mammography is now closed because of no female technicians. Total 20 patients have been tested so far.

3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	General X-ray Machine	CXR	Lumbosacral Spine/Cervical Spine	X-ray PNS	X-ray KUB & abdomen	Others	
		50%	20%	15%	10%	5%	
2	CT Scan	Brain	Abdomen	Chest	Others		
		80%	10%	5%	5%		
3	MRI Machine	Brain	Lumbosacral Spine/cervical spine	Others			
		30%	50%	20%			
4	USG	Whole Abdomen	Pregnancy profile	Upper Abdomen	Lower Abdomen	Others (Thyroid, Neck, Swellings)	
		40%	10%	30%	15%	5%	

\*All numbers are approximately per year

4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No, Room has 10inches concrete wall	No	wooden board	No	No, Patient need to wait in corridor. Most of the time they need to stand long time due to lack of seat	
2	MRI	No	No	No	Yes	Ditto	
3	CT scan	Yes, Room has 20inches concrete wall	Yes	Yes	Yes	Ditto	
4	USG	No	No	No	Yes	Ditto	
5	Mammography	No	lead glass protection	No	Yes	Yes	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Professors	2	1	
2	Associate professors	4	6	
3	Assistant professors	8	7	
4	Medical Officers	4	4	
5	Radiologists	6	6	
6	Consultant	-	1	
7	Technologists		22	

## 6) Comments (Findings from Observation and Interview)





There are no female technologists. Patient burden is huge. Doctors have almost no foreign training. The department is in the first floor near OPD. Rooms are not sufficient and properly protected. There is no lead shield & adequate protection in X-ray room only wall thickness is 10 inches. Sometimes patients attendent stay in the room during exposure. It is also hazzardus to the technician as well. The CT scan room has 20 inches thick wall & lead shield on door & window which is given by JICA. TLD batch was provided to the technicians in the basis of monthly payment of some fees from GOB. But as DMC authority is not paying the fees so they take away the batch. There is no system of measuring amount of radiation. There is no separate waiting room for the patient and they need to wait in the corridor, there are also lack of adequate No. of seats so sometimes patients have to seat on the floor. There is no restriction in entry of persons in X-ray room during procedure so some time patients privacy become compromised. There is also scarcity of modern equipment to support the increasing No. of patients. There is no computerised statistics of No. of patients they serving. So they provided an approximate No. of patients. Cleanliness of the rooms is not sufficient. Doctors stay only in office hours. Operators work in three shifts in a day. Machines work 24/7. All the operators are trained in BSMMU under DGHS. Machines have one year warranty. After that GOB bears the maintenance but it takes long time to the government engineers to come and repair the machines. So many machines get useless because of proper maintenance so patients do not get service despite of presence of machine. Costs of the tests are very lower than private hospitals and in case of very poor patients tests are done free under professors' recommendation. There is one X-ray machine currently working in the DR system others are CR and normal radiograph. There is only one CT scanner and another machine is non-functioning. One machine is not sufficient to support all patients. All the doctors & technicians are very helpful to the patients they are supporting the patients with all the problems and small number of equipment.

## (2) Gastroenterology

### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Endoscopy-Gastroscope	1	Fujinon		2006	
2	Endoscopy-Gastroscope	2	Pentax	EPK-1000	2005	
3	Endoscopy-Dudenoscope	1	Fujinon		2007	
4	Endoscopy-colonoscope	1	Fujinon		2007	
5	Fibroscan	1	Echosens-Canada	FS402	2007	
6	Fibroscan	2	Echosens-Canada	FS402	2014	
7	C-arm	1	KMC-950	Stationary 30kw	2014	

## Photos

	
Label of Fluoroscopic X-ray system	C-Arm
	
Endoscope	Endoscope

## 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Endoscopy-Gastroscope					1500/year	
2	Endoscopy-Gastroscope					1500/year	
3	Endoscopy-Dudenoscope					1000/year	
4	Endoscopy-colooscope					1200/year	
5	Fibroscan					2/month	
6	Fibroscan					2/month	

### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Endoscopy Gastroscope	Upper Gastrointestinal tract	Endoscopy guided biopsy	Endosonography			
		6,000	2,000	100			
2	Endoscopy Colonoscope	Colonoscopy	Colonoscopy guided biopsy				
		3,000	200				
3	Endoscopy Duodenoscope	ERCP					
		1,000					
4	Fibroscan	Liver scan					Just started, no data available

\*All numbers are approximated.

### 4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Endoscopy		Moderate	Yes		Yes	
2							

### 5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Professors	1	1	
2	Associated professors	2	4	
3	Assistant professors	3	6	
4	Registrar	1	1	
5	Assistant registrar	2	2	
6	Medical officers	-	2	
7	Nurse(male)		2	
8	Nurse(female)		2	

### 6) Comments (Findings from Observation and Interview)

Although there is a C-arm machine in the endoscopy room, there is no protective wall. They have one endoscopy room in 1<sup>st</sup> floor other new one at the 2<sup>nd</sup> floor. No posts for the sweeper and ward boy. Staff are limited than patient number. Patients have to wait long time for getting the test done. They are given a date in the serial list. Approximately 7 days after registration they can do test. In case of emergency under recommendation of professors, tests are done immediately when patient comes.

### (3) Cardiology (Cath-Lab)

#### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Angiogram(angiostar plus)	1	SIEMENS	5764522	2007	
2	Auto injector	1	Liebel-Flarshim			
3	Auto injector	1	Liebel-Flarshim			
4	Portable ECG	1				

## Photos



## 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Angiogram					2500	

\*Approximated

## 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Angiogram	CAG	PTCA	PPM	PTMC	TPM	
		12/month	10/month	4/month	5/month	9/month	

## 4) Condition of the room and patient care

No.	Equipment	Shield of the room	Cleanliness of the room	Console	Patient privacy	Waiting space	Comments
1	Angiogram	Lead sheet in doors	Good		Yes	None	

## 5) No. of staff in the cath-lab

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Operator		1	
2	Nurse		3	

## 6) Comments (Findings from Observation and Interview)

The Cath lab is situated in 1<sup>st</sup> floor of old building of DMCH nearer to the Emergency. There is one Angiogram machine active from 2007 though it was established in 2004. The operator has training from National institute of cardiology. The nurses also did course for 2 months from the institute. Department of Cardiology uses the lab for two days in a week according to the availability of patient. It is used only in office hours. In other days of the week department of Neuromedicine or Neurosurgery uses. The professors perform the tests and operations. They have two injectors. There is no backup for electricity. The generator room is adjacent to the main room. Maintenance of the machine is done by Siemens Bangladesh during the warranty period which is for 5 years. Then it has to be done by GOB.



## 4. KHULNA MEDICAL COLLEGE HOSPITAL

Date of survey: 06-07/07/2014

### At a glance

#### (1) Overview

Level	Tertiary
Location	Khulna
Year of established	1989
Population in division	15,386,663
No. of beds	500
No. of OPD	197,861
No. of Emergency	6,111
No. of admission	43,304
Bed Occupancy Rate (%)	140.00

Source: Local Bulletin 2013



TOP 3 diseases patients admitted				TOP 3 diseases of patient deaths			
1	I619 Intracerebral haemorrhage, unspecified	8.24%		1	I619 Intracerebral haemorrhage, unspecified	17.03%	
2	O80 Single spontaneous delivery	8.13%		2	I21 Acute myocardial infarction	3.79%	
3	T149 Injury, unspecified	3.02%		3	X689 Intentional self-poisoning by and exposure to pesticides, unspecified	2.34%	

Source: Local Bulletin 2013

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	○	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	-	Nephrology	-	Physical medicine	-
CCU	○	Neurosurgery	-	Psychiatry	○
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	-
ENT & HN Surgery	○	OBGY	○	SCANU	-
Gastroenterology	○	Ophthalmology	○	Urology	-

Note: Radiotherapy section is being established at present. Prison cell is available in the hospital.

#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	12,65,60,108/-	14,85,56,000/-	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

Source: Interview with Director of the Hospital

## 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician	88	82	
Nurse	157	157	
Medical Assistant	0	0	
Medical Technologist	12	12	

Source: Local Bulletin 2013

## 3) Medical waste management (Observation)

Availability of Incinerator	No
Separation of wastes	Yes
Process of waste disposal	City Corporation collects medical waste from the hospital.

By Department

(1) Radiology and Imaging

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray Machine(500 mA )	1	NEODIAGNOMAX	R- 3	1989	
2	X-ray Machine(500 mA )	1	SIEMENS	ICONS R-100 AXIOM	2009	
3	X-ray Machine(500 mA )	1	SIEMENS	ICONS R-100 AXIOM	2010	
4	X-ray Machine(300 mA )	1	LISTEM(south korea)	REX- 325R	2004	
5	X-ray Machine CR	1	FUJIFILM CAPSULA X	CAPSULA X	2011	
6	USG Machine 2D	1	LANDWIND F/40	Hm 1202	2009	
7	USG Machine 2D	1	SIEMENS	Adara SONOLINE Mc 12H6J3-M	2004	
8	USG Machine 2D	1	Sonalisa 32	AS500	2006	
9	USG Machine 4D	1	CHISON iVis 60 EXPERT	LCD 1502	2013	
10	16 Slice CTscan	1	SIEMENS	SOMATOM Emotion 10165880	2008	
11	Mammography	1	MED SEEUCO	XM 4000B	2013	

Photos

	
CT scanner	X-ray room

## 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	General X-Ray Machine	41,533	44,789	48,645	52,473	57,543	
2	Fluroscopy X-Ray						
3	CT Scan	1,465	3,000	4,056	1,178	4,087	
4	USG	16,872	18,954	19,876	21,657	22,564	
5	Mammogram Machine						Total 10

Source: All datas are collected on the basis of best possible estimate.

### Comments:

In the Khulna MCH, the mammogram machine is very new as it has just arrived at the premises and only 10 patients have been examined by it but now the machine is not functioning (repairable). They give us an approximate No. of patients as there is no written or computerised data available there then we convert it in year. They told us that this number may slight more or less per year and their number of patient is increasing.

## 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	General X-Ray Machine	CXR	L/S Spine/Cervical Spine	Fracture	X-Ray KUB & abdomen	Others	
		50%	20%	20%	5%	5%	
3	CT SCAN	Brain	Others				
		90%	10%				
4	USG	Whole Abdomen	pregnancy profile	upper Abdomen	Lower Abdomen	Others	
		30%	30%	20%	10%	10%	

## 4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No	No	No	Yes	Yes	
2	CT scan	No	No	No	Yes	Yes	
3	USG	No	No	No	Yes	Yes	
4	Mammography	No	No	No	Yes	Yes	

## 5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist	9	2	
2	Technologist	3	4	Required 6 technologists

#### 6) Comments (Findings from Observation and Interview)

Despite Khulna MCH is located in the Khulna Division, the number of equipments available in the Radiology Department is insufficient. Equipment such as MRI machine, Digital X-Ray Machine, 4D Color Doppler's and Portable X-Ray Machines etc. are not totally available in the department and these machines need to be allocated more in numbers to the department. The lack of these particular machines is hampering the quality of service provided to patients who deserve to have the best quality care despite Khulna being one of the eight major divisions in Bangladesh.

Along with the limited amount of equipments, the manpower needed to efficiently run the department is also very limited as only 3 technologists handle all the operations in the department. It is very tough on them and also never sufficient enough to provide high quality service to the patients. Therefore, along with necessary equipments, the Radiology Department also needs trained technologists to perform day-to-day operations.

#### (2) Gastroenterology

##### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Endoscopy Machine	1	PENTAX	EPK-1000	2011	
2						

#### Photos

	
Endoscope	Room for endoscopy

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Endoscopy Machine				504	497	

#### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Endoscopy Gastroscope	Normal	Gastritis	Peptic Ulcer Disease	CA Stomach	CA Esophagus	
		171	96	45	29	15	

#### 4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Endoscopy Machine	Very Small	Average	Not Satisfactory	Yes	No	

#### 5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Professor - 1		1	
2	Assistant Professor – 1		1	
3	Registrar – 1		1	
4	Assistant Registrar - 1		1	

#### 6) Comments (Findings from Observation and Interview)

Only one endoscopy machine is currently available at Khulna MCH but they severely and urgently need to be equipped with a colonoscopy and duodenoscopy machines so that the patients can be provided with a much greater level of service than they are already being provided with. There are expert doctors available in the department who can operate the machines but due to the lack of these machines in the Department of Gastroenterology, the doctors cannot give quality care to their patients.

In the Gastroenterology Department, the doctors advised 30%-35% more patients than the actual number who have taken the endoscopy test in reality. These 30%-35% could not take the test due to various reasons such as being extremely poor or the lack of equipments to cover the tests of all the patients who had been advised in total.

#### (3) Cardiology (Cath-Lab)

The Cardiology Department is in very poor condition at the Khulna MCH. The Department does not have a Cath Lab or an Angiogram machine. Moreover, there is only Associate Professor working in the Department and he alone is responsible for the maintenance of the entire Cardiology Department. This Department needs both human resources and necessary equipments in order to keep the Department alive and expand it to cater to the various needs of patients and to provide a higher quality of service to the population of Khulna.

## 5. M.A.G. OSMANI MEDICAL COLLEGE HOSPITAL, SYLHET

Date of survey: 01-02/07/2014

### At a glance

#### (1) Basic Information

Level	Tertiary
Location	Sylhet
Year of established	1962
Population in division	9,181,937
No. of beds	900
No. of OPD	746,990
No. of Emergency	132,996
No. of admission	111,663
Bed Occupancy Rate (%)	157

Source: Local Bulletin 2013



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	Unspecified injury of head	9.96%	1	Stroke, not specified as haemorrhage or infarction	11.39%
2	Abdominal pregnancy	4.37%	2	Septicaemia, unspecified	5.71%
3	Diarrhoea and gastroenteritis of presumed infectious origin	3.55%	3	Acute myocardial infarction	4.19%

Source: Local Bulletin 2013

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	-	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	○
Gastroenterology	○	Ophthalmology	○	Urology	○

#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	36,43,13,000/-	40,97,01,000/-	39,19,35,000/-
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

Source: Interview with Director of the Hospital

##### 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician	214	192	
Nurse	308	213	
Medical Assistant	0	0	
Medical Technologist	27	27	

Source: Local Bulletin 2013

3) Medical waste management (Observation)

Availability of Incinerator	No
Separation of wastes	Yes
Process of waste disposal	Dumping System but not yet established



By Department

(1) Radiology and Imaging

1) List of Equipment

No	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray Machine (500mA)	1	SHIMAZU	EUD-150L9S40E	2014	
2	X-Ray Machine (500mA)	2	SIEMENS (China)	AXIOM-ICONOS R 100	2009	
3	X-Ray Machine (500mA)	3	LISTEM (South Korea)	REX-550	2008	
4	X-ray Machine (1000mA)	1	APOLLO DRF-4343	DRF - 4343VILLAS YSTEM MEDICAL, ITALY	2009	Spare Parts need to be replaced, assigned specialist has stated.
5	X-Ray Machine (Portable) 150mA	1	SIEMENS	5605022	2009	
6	X-Ray Machine (Portable) 150mA	2	SIEMENS	10187820	2009	
7	Mamography X-Ray Machine (30mA)	1	LORAD AFFINITY HOLOGIC COMPANY	06810 USA	2009	
8	Dental X-ray unit (10mA)	1	BLUEX (Italy)	PANTOS 16XP	2012	
9	CT Scan Single Slice	1	SIEMENS	SOMATOM EMOTION 03804890 (Germany)	2006	
10	MRI Machine 0.3T	1	HITACHI (ARIS-II)	MR-WS-11HITACHI	2006	Medium Body Coil is damaged since 10.11.2013
11	USG Machine	1	MINDRAY	DP-7	2014	
12	USG Machine	2	LOGIQ P5 GE HEALTH CARE (Korea)		2012	
13	USG Machine	3	LOGIQ 3 EXPERT (Korea)	AY-15CUI	2010	

2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	General X-Ray Machine	43,227	57,295	58,463	60,436	69,770	
2	CT Scanner	2,647	264	2,508	5,027	4,964	
3	MRI Machine	732	880	734	483	692	
4	USG	18,518	22,776	22,240	20,998	28,046	
5	Mammogram Machine	200	350	400	370	420	

Comments:

Every day, only 2-3 Patients are being examined by the Mammogram Machine. However, out of the amount of patients the Doctors advise to do Mammography on a daily basis, about 95% of the patients are able to do the Mammography test and the rest of the 5% cannot take the test due to unavoidable circumstances. These tests are all being performed at the Radiology Department of Sylhet MCH.

3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	General X-Ray Machine	CXR	L/S Spine/Cervical Spine	X-Ray Shoulder Joint	X-Ray PNS	Others	
		45%	25%	15%	10%	5%	
2	Fluoroscopy X-Ray						
3	CT Scan	Brain	Abdomen	Chest	Others		
		70%	10%	10%	10%		
4	MRI Machine	L/S Spine	Brain	Others & Joints			
		65%	20%	15%			
5	USG	Whole Abdomen	Lower Abdomen	Hepatobilliary system	KUB	Others	
		50%	20%	10%	10%	10%	

4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	Lead Shield	Yes	Yes	Yes	Yes	
2	MRI	Lead Shield	Yes	Yes	Yes	Yes	
3	CT scan	Lead Shield	Yes	Yes	Yes	Yes	
4	USG	Lead Shield	Yes	Yes	Yes	Yes	
5	Mammography	Lead Shield	Yes	Yes	Yes	Yes	

5) No. of staff in the department

Radiologists:

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist	-	7	
2	Technologist	9	9	

6) Comments (Findings from Observation and Interview)

The Radiology Department at Sylhet MCH is relatively endowed with necessary equipment but they are lacking qualified technologists in their department to completely provide the best of their services the patients are expecting from them.

## (2) Gastroenterology

### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Colonoscopy Machine	1	PENTAX	FG-29W		
2	Fibroscan Machine	1	ECHOSSENS (France)	F-40311		Started from 07.06.2014

### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Gastroscope	3,562	3,533	3,389	3,298	3,152	
2	Colonoscope		454	489	530	396	
3	Duodenoscope			10	33	63	

### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Endoscopy Gastroscopy						Review is ongoing

### 4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Colonoscopy Machine	Very Small	Average	Yes	Yes	No	
2	Fibroscan Machine						Portable Machine

### 5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Assistant Professor	3	3	
2	Associate Professor	1	1	
3	Registrar	1	1	
4	Assistant Registrar	1	1	

### 6) Comments (Findings from Observation and Interview)

The Gastroenterology Department was renowned among the ones which existed at the time in Sylhet Osmani MCH. However, due to the non-functional equipment which got damaged over time is really hampering the medical personnel from providing service to their patients. Currently, only one Colonoscopy Machine is active which is not adequate at all to service the amount of patients who visit the Hospital. On top of that, five of their Endoscopy machines are totally non-functional. So, they cannot provide adequate service to the patients who need it the most.

In the Gastroenterology Department, about 30%-40% patients did not avail tests due to various issues including delay for test.

### (3) Cardiology (Cath-Lab)

#### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Angiogram Machine	1	SIEMENS	AXIMO	2006	
2						

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Angiogram Machine		349	424	503	488	
2							

#### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Angiogram Machine	CAG	PTCA	PPM	TPM		
		350-400	15-20	20-25	30-35		

#### 4) Condition of the room and patient care

No.	Equipment	Shield of the room	Cleanliness of the room	Console	Patient privacy	Waiting space	Comments
1	Angiogram Machine	-	Clean	Yes	Yes	Yes	

#### 5) No. of staff in the cath-lab

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Cardiologist		5	
2	Technologist		0	No Technologist in the Cath Lab.

#### 6) Comments (Findings from Observation and Interview)

All radiographers belong to the Radiology Department. So, when an Angiogram is performed, the Cardiology Department ask the Radiology Department to send radiographers as much as they need.

## 6. RAJSHAHI MEDICAL COLLEGE HOSPITAL

Date of survey: 03/07/2014

### At a glance

#### (1) Basic Information

Level	Tertiary
Location	Rajshahi
Year of established	1958
Population in division	18,027,522
No. of beds	530
No. of OPD	560,628
No. of Emergency	117,979
No. of admission	123,417
Bed Occupancy Rate (%)	237.89%

Source: Local Bulletin 2013



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	N/A		1	N/A	
2	N/A		2	N/A	
3	N/A		3	N/A	

Source: confirmation

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	-	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	-
Gastroenterology	○	Ophthalmology	○	Urology	○

#### (3) Hospital Management

##### 1) Budget & Expenditure (Currency in BDT)

Budget	FY2011-2012	FY2012-2013	FY2013-2014
Total	381,513	400,013	
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
Total	371,297	391,103	
Total additional	847	753	

Source: Interview with Director of the Hospital

##### 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician	218	214	
Nurse	349	344	
Medical Assistant	0	0	
Medical Technologist	43	43	

Source: Local Bulletin 2013

### 3) Medical waste management (Observation)

Availability of Incinerator	Yes ( Insufficient and very small for the requirement)
Separation of wastes	Yes
Process of waste disposal	Wastes are separated in different colored plastic drum in different wards. From there it is collected by sweepers allocated by the hospital & then it was shifted to city corporation waste management van that comes to the hospital each day. City corporation staff dumped those as garbage along with household and general waste material.

By Department

(1) Radiology and Imaging

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray machine(100mA)	1	LISTEM	DHM 100N	2003	Not work perfectly. Need to be replaced.
2	X-ray machine(500mA)	2	LISTEM LISTEM	1)REX 550RF 2)REX 550RF	1)2009 2)2004	The 2nd no machine is repairable. There is another non-repairable machine.
3	X-ray machine(portable 100Ma)	1	SIEMENS	10187800	2008	
4	Spiral CT Scan	1	ASTERION			This is non-repairable & need to be replaced.
5	MRI Machine	1	HITACHI	AIRIS II		
6	USG machine	5	1)TOSHIBA 2)TOSHIBA 3)LANDWIND 4)HAIYING 5)MINDRAY	1)SSA 325A 2)SSA 325A 3)HM 1202 4) 5)DP 7	1)2005 2)2005 3)2010 4)2014 5)2013	The 1 <sup>st</sup> one is repairable.
7	Mammogram machine	0				There is no mammogram machine.

2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	General X-ray machine	38,705	39,895	39,187	40,780	41,370	
2	CT scanner	2,285	2,015	2,078	-	-	
3	MRI	1,628	1,720	1,875	1,980	1,526	
4	USG	20,570	21,350	19,885	21,365	22,345	

Comments: The CT scan machine has not been functioning since 2012.

3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	X-Ray	Chest	Joint & limb	PNS	Abdomen	Spine	
		16,548	12,411	6,206	4,137	2,069	
2	CT Scan						CT not functioning since 2012.
3	MRI	Spine	Brain	MRCP	Hepatobiliary	Abdomen	
		610	458	229	153	76	
4	USG	Whole abdomen	Pregnancy profile	Swelling	Thyroid	Scrotum	
		11,123	6,704	2,235	1,341	899	

4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No shield except wall thickness.	Yes	Yes	No	No	There is no shield over the ceiling.
2	MRI	Yes	Yes	Yes	Yes	No	
3	CT scan	Yes	Yes	Yes	Yes	No	
4	USG	No	Yes	Yes	No	No	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist		10	There is one associate professor, four assistant professors and five medical officers. They are all permanent.
2	Radio technologist		10	They all have acquired “Diploma in Health Technology” & attend in the seminar on CT & MRI for 2 weeks under DG Health. They are permanent.

6) Comments (Findings from Observation and Interview)

<p>Mammogram, CR, DR, Colour Doppler, 4D ultrasound have never been installed in this hospital. So they feel necessity to install these equipment urgently.</p> <p>The radiology department of Rajshahi MCH has got two new Chinese ultra sonogram machines from April, 2014. None of the machines including the new one works satisfactorily according to the radiologists. Patient burden is huge so they need more machines with skilled manpower. The CT scan machine has been non-functioning for two years. They had bought a new machine this year but it has not been installed yet. The CT room still contains the old machine.</p> <p>One X-ray and one ultrasound machine work in the evening and in night on emergency call. For all other machines of radiology works everyday from 8 am to 2pm. Each of them can be used on emergency call.</p>
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## (2) Gastroenterology

### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Upper GI endoscopy	3	PENTAX	EPK 1000	2010	One is functioning, one is repairable & another one is new and not installed.
2	Sigmoidoscopy	1	PENTAX	EPK-P	2010	
3	Colonoscopy	1				Scope is not functioning for last 2 years.

### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Gastroscopy	1,440	1,505	1,480	1,620	1,838	
2	Colonoscopy	85	61	53	-	-	Scope non functioning from 2012
3	Sigmoidoscopy	-	-	-	-	14	

### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Endoscopy Gastroscopy	Normal	Gastritis	Peptic ulcer disease	Varices	Carcinoma stomach	
		827	460	368	110	73	
2	Colonoscopy	Normal	IBD	Carcinoma colon	Ulcer, erythema	Polyp	
		22	17	10	3	1	
3	Sigmoidoscopy	Normal	Intestinal bleeding	Ulcer in descending colon & rectum	Colorectal cancer	Polyp	
		6	3	2	2	1	

### 4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Gastroscopy	All tests by these 3 types of instruments are done in a same room. So the space become more congested.	Clean	Yes	Yes	No	There is a Bronchoscopy machine in that same room. So the space becomes more occupied than its need.
2	Colonoscopy		Clean	Yes	Yes	No	
3	Sigmoidoscopy		Clean	Yes	Yes	No	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Gastroenterologist		3	1 associate professor of gastroenterologist, 1 hepatologist, 1 registrar.
2	Nurse		1	
3	MLSF		1	
4	Sweeper		1	

6) PERCENTAGE OF PATIENT GETTING SERVICE (PER MONTH):

NO.	Equipment	Investigation advised	Investigation done	Patient did not avail Test due to various reason	Comments
1	Endoscopy	750-900	220-300	33%	
2	Colonoscopy				Not done
3	Sigmoidoscopy				Not done

7) Comments (Findings from Observation and Interview)

<p>There are 3 upper GI endoscopy machines. One of which is functional, another one is sent to repair in NEMEW and other one is new and kept in the store due to lack of space. There is one colonoscopy machine which is not functioning for 2 years and should be replaced urgently. All the tests by these types of instrument are done by 2 experts. The tests by upper GI endoscopy are done 5 days per week in their working hour. They are advised to perform the tests from different department like medicine and surgery about 25 to 30 in number. But only 7 to 10 tests by upper GI endoscopy are done per day.</p> <p>A new gastroenterologist, expert in ERCP, has joined in this hospital recently. So they feel necessity to have an ERCP machine.</p>
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### (3) Cardiology (Cath-Lab)

#### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Coronary angiogram machine	1	SIEMENS	VF01C	2000	
2	Defibrillator	2	1)NIHON KOHDEN 2)METRAX	1)TEC 5531K 2)M240-EC01	1) 2010	METRAX is repairable as the battery is nonfunctional.

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Angiogram	400	431	469	570	792	

#### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Angiogram	CAG	PTCA	PPM	PTMC	TPM	
		600	84		60	48	

#### 4) Condition of the room and patient care

No.	Equipment	Shield of the room	Cleanliness of the room	Console	Patient privacy	Waiting space	Comments
1	Angiogram machine	No, except door	Yes	Present	Yes	Not adequate	

#### 5) No. of staff in the cath-lab

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Cardiologist		10	1 Associate professor, 5 assistant professors, 1 register & 3 medical officers.
2	Technologist		2	One is trained under NICVD for 1 month. Other one is not trained yet.
3	Nurse		2	

#### 6) Comments (Findings from Observation and Interview)

The number of medical technologists is very few. They have no special training on respective machine except senior medical technologist who has got trained on his personal effort. They are not well protected from radiation hazard.

## 7. RANGPUR MEDICAL COLLEGE HOSPITAL

DATE OF SURVEY: 22/06/2014

### At a glance

#### (1) Basic Information

Level	Tertiary
Division	Rangpur
Population in division	15,434,619
Year of established	1970
No. of beds	1000
No. of OPD	237,733
No. of Emergency	3,544
No. of admission	89,379
Bed Occupancy Rate (%)	120

Source: Local Bulletin 2013



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	Pedestrian injured in unspecified traffic accident	3,374	1	Cerebrovascular disease, unspecified	449
2	Multiple superficial injuries, unspecified	2,417	2	Asphyxia	421
3	Cholera, unspecified	1,667	3	Sequelae of unspecified infectious or parasitic disease	397

Source: Local Bulletin 2013 (Since the percentage of the causes of admission or death is not available, the numbers of cases are indicated in this table.)

#### (2) Health services

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	-	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	○
Gastroenterology	○	Ophthalmology	○	Urology	○

#### (3) Hospital Management:

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

Source: Interview with Director of the Hospital

## 2) Human Resources

Manpower	Sanctioned	Filled	Comments
Physician	31	31	
Nurse	354	342	
Medical Assistant	0	0	
Medical Technologist	12	12	

Source: Local Bulletin 2013

## 3) Medical waste management (observation):

Availability of Incinerator	No
Separation of wastes	Yes
Process of waste disposal	Wastes are separated in different colored plastic bin in different wards. From there it is collected by sweepers allocated by the hospital and then it was shifted to city corporation waste management van that comes to the hospital each day. City corporation staff dumped those as garbage along with household and general waste material.

By Department

(1) Radiology and Imaging:

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray machine 1000mA	1	Italy	-	1999	
2	X-ray machine 500mA	1	Listern,Korea	MLIF-09	2008	
3	X-ray machine 100mA	2	Toshiba	Meditronics	2000	
4	X-ray machine Digital	2	Philips	Optimus 50,Essenta DR compact	2013	
5	X-ray machine Portable	1	Meditronics		2005	
6	X-ray machine Portable	2	Ascot	SMAM 3	2005	
7	MRI machine	1	Hitachi	0.3 Tesla	2007	
8	MRI machine	1	Philips	-	2013	
9	Mammography machine	1	Lorad Affinity	30005066	2008	Out of order
10	USG machine	1	Philips	IU22	2012	
		1	Toshiba	-	2002	
		1	Hitachi	-	2000	

Photos:

	
CT scanner not functioning	Reading image of MRI

1) Number of Patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	MRI	N/A	1,368	1,872	2,244	1,890	
2	CT scanner	N/A	2,664	Out of order	5,028	5,592	
3	General X-ray	N/A	36,240	33,852	35,058	36,198 (CR-3930)	
4	USG	N/A	5,568	5,160	8,645	10,962	
5	Mammography	Out of order					

2) Number of patients examined by type of test/main diagnosis (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	MRI	L/S Spine	Dorsal spine	Brain	Cervical Spine	MRCP	
		948	450	310	182	Not done	
2	CT scan	Brain	Abdomen	Chest	Neck	PNS	
		4,110	1,052	430	-	-	
3	General X-ray	CXR	L/S spine	Shoulder	PNS	Others	
		16,718	9,240	7,250	2,000	990	
4	USG	Whole Abdomen	Lower Abdomen	Hepatobiliary system	KUB	Others	
		3,150	3,022	2,775	1,225	790	
5	Mammography						Out of order

4) Condition of the room and patient care by equipment:

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No	No	Yes	Yes	Inadequate	
2	MRI	No	No	Yes	Yes	Inadequate	
3	CT scan	No	No	Yes	Yes	Inadequate	
4	USG	Yes	Yes	Yes	Yes	Inadequate	
5	Mammography	Not Done	Not Done	Not Done	Not Done	Not Done	Out of order

5) No. of staff in the department:

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist		10	
2	Technologist		14	

6) Comments (Findings from observation and interview)

Since the establishment of Rangpur MCH, the Radiology Department has not improved much. The main problem is unavailability of skilled manpower and in some cases lack of manpower. Some machines are too old to operate. Adequate space will be required for any kind of new instrument and machineries. Overall improvement of this department is recommended.

(2) Gastroenterology:

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Endoscopy machine	1	Fujinon	-	2013	
		1	Pentax	-	2013	
2	Colonoscopy machine	1	Fujinon	-	2013	
		1	Pentax	-	2013	

2) Number of patients examined by equipment:

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Endoscopy	-	-	-	-	1,648	
2	Colonoscopy	-	-	-	-	304	
3	ERCP	-	-	-	-	01	

3) Number of patients examined by type of test/main diagnosis (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Endoscopy	Gastritis	PUD	Varices	Ca. Stomach	Ca. Esophagus	
		824	550	150	74	50	
2	Colonoscopy	Hemorrhoid	Ulcer, Erythema	Ca. Colon	IBD	Polyp	
		94	70	54	43	43	
3	ERCP	Diagnostic	-	-	-	-	
		01	-	-	-	-	

4) Condition of the room and patient care:

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Endoscopy	Inadequate	Moderate	Yes	Irregular	No	
2	Colonoscopy	Inadequate	Moderate	Yes	Irregular	No	
3	ERCP	Inadequate	Moderate	Yes	Irregular	No	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Physician	-	2	
2	Technician			

6) Percentage of patient getting service (per month)

No.	Equipment	No. of Investigation advised	No. of Investigation done at the Dept.	Patient did not appeared as because of long queue over the week
1	Endoscopy	270-300	135-140	60%
2	Colonoscopy	60-80	25-30	60%
3	ERCP	Not done	Not done	Not done

Source: Assoc. Prof. Dr. Jimma Hossain, Gastroenterology Department, RMCH



7) Comments (Findings from observation and interview):

Inadequate space in this department. As such service quality is poor. They have a 24 bed ward in the newly constructed hospital wing, which is not at all adequate. So urgently they need more space to perform the investigations and interventions. Their doctors are already performing all the tests in outside private hospitals. They also do not have instruments like ERCP, Balloon dilatation probe, Fibroscan which is available outside in private hospitals. If these requirements are fulfilled, they can give a better service in future.

(3) Cardiology (Cath-lab)

1) List of Equipment:

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Angiogram	1	Siemens	Angiostar Plus	2000	

Photos:

	
Cath room at new building	Angiogram machine

2) Number of patients examined by equipment:

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Angiogram	-	-	-	300	300	

3) Number of patients examined by type of test/main diagnosis:

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Angiogram	CAG	PTCA	PPM	PTMC	TPM	
		300	-	-	-	-	

4) Condition of the room and patient care:

No.	Equipment	Shield of the room	Cleanliness of the room	Console	Patient privacy	Waiting space	Comments
1	Angiogram	No	Clean	Yes	Yes	Yes	

5) No. of staff in the cath-lab:

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Cardiologist	-	4	
2	Technologist	-	2	
3	Nurse	-	4	

6) Comments (Findings from observation and interview)

Rangpur MCH was the first to introduce Angiogram machine in this part of the country. But as time passes by, there is no improvement of this department. There is also severe manpower problem and technicians are lacking proper training. So more modern machines and skilled technicians are required to uphold the services of this department

## 8. Bangabandhu Sheikh Mujib Medical University (BSMMU)

Date of survey: 21/06/2014 to 26/06/14

### At a glance

#### (1) Basic Information

Level	Tertiary
Location	Dhaka
Population in division	45,568,835
Year of established	1965
No. of beds	1,500
No. of OPD	664,274
No. of Emergency	8,817
No. of admission	29,422
Bed Occupancy Rate (%)	98

Source: Statistics, BSMMU Census 2011



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	N/A		1	N/A	
2	N/A		2	N/A	
3	N/A		3	N/A	

#### (2) Health services

##### 1) Department

Blood transfusion	○	General Surgery	○	Orthopedic surgery	○
Burn Unit	-	ICU	○	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	○	Nephrology	○	Physical medicine	○
CCU	○	Neurosurgery	○	Psychiatry	○
Clinical Laboratory	○	NICU	○	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	○	Radiotherapy	○
ENT & HN Surgery	○	OBGY	○	SCANU	-
Gastroenterology	○	Ophthalmology	○	Urology	○

##### 2) Service Hour

OPD	8:30 – 14:00 (Sat – Thu)	Emergency	24/7
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#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

## 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician		634	
Nurse		785	
Medical Assistant			
Medical Technologist		N/A	

Source: Local Bulletin 2013

## 3) Medical waste management (Observation)

Availability of Incinerator	Not available
Separation of wastes	Yes
Process of waste disposal	City corporation collect the medical wastes.

### By Department

#### (1) Radiology and Imaging

##### 1) List of Equipment

No	Equipment	Amount	Manufacture	Model	Product Year	Comments
1	X-ray Machine(500mA)	1	LISTEM(south korea)	Rex-550R	2011	
	X-ray Machine(500mA)	2	LISTEM(south korea)	Rex-550R	2011	
2	X-ray Machine (portable)	1	FUJI LIMITED		2011	
3	Dental X-ray unit	1	SIEMENS		2014	
4	CT Scan 64 Slice	1	HITACHI	IEC60825-1	2011	
5	Mammogram Machine	1	AGFA	CR30X	2013	
6	MRI Machine 1.5T	1	SIEMENS	MAGNETOM AVANTO	2011	
7	USG Machine 4D	4	GE	VOLUSON 730 PRO	2011	
	USG Machine 4D	1	Siemens	ACUSON X700	2014	
	USG Color Doppler	1	Phillips	IU22	2014	

##### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	MRI					4,300	
2	CT scanner		12,845	13,056	13,500	14,200	
3	General X-Ray Machine	124,800	140,400	156,000	187,200	193,440	
4	USG	51,000	56,500	62,500	74,000	82,000	
5	Mammogram Machine						400-600 in Jan. to Jun. 2014

Source: Interview with Medical Technologist, Radiology & Imaging Dept. in May and June, 2014. Since the statistical data is not available, the numbers are approximated.

##### Comments:

Maximum equipment are vastly used and some are obsolete. Moreover only one CT Scan and MRI machine is available here. So, it is very difficult to diagnose and treat patients in time. If sufficient advanced medical equipment can be ensured then it would be possible to serve more number of patients.

##### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	MRI	L/S Spine	Brain	MRCP	Cervical Spine	Dorsal Spine	
		4,500	3,100	1,200	675	575	
2	CT Scan	Brain	Abdomen	Chest	Neck	PNS	
		7,250	3,250	1,750	1,350	1,350	
3	General X-Ray Machine	CXR	L/S Spine/Cervical Spine	X-Ray Shoulder Joint	X-Ray PNS	Others	
		55,000	55,000	33,500	17,500	12,500	
4	USG	Whole Abdomen	Lower Abdomen	Hepatobiliary system	KUB	Others	
		16,500	14,500	7,250	4,750	4,750	

4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	Lead coated	No	Yes	Yes	Not sufficient	
2	MRI			Yes	Yes	Not sufficient	
3	CT scan	Lead coated	No	Yes	Yes	Satisfactory	
4	USG	No	No	Yes	Yes	Satisfactory	
5	Mammography	No	No	Yes	Yes	Satisfactory	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist (Total)	-	30	
	Professor	-	2	
	Associate Professor	-	5	
	Assistant Professor	-	10	
	Medical Officer	-	13	
2	Technologist	-	22	

2. Gastroenterology

(1) List of Equipment

No.	Equipment	Amount	Manufacture	Model No.	Product year	Comments
1	Endoscopy Machine	1	FujiNON EPX 201	EG-250WR5	2002	Repairable
2	Endoscopy Machine	1	Olympus	GIFQ150	2002	
3	Endoscopy Machine	1	Olympus	GIFQ145	2002	(Non Functional)
4	Colonoscopy Machine	1	Olympus	CF-150-L	2002	
5	Colonoscopy Machine	1	Olympus	CF-145-L	2002	Non Functional
6	Colonoscopy Machine	1	FujiNON EPX 201	FC-200MR Type 15	2002	Repairable
7	ERCP Machine	1	Olympus	TJF-145	2002	
8	ERCP Machine	1	Olympus	TJF-150	2002	Non Functional

2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Gastroscope		1,422	1,660	1,710	1,823	
2	Colonoscope		441	560	480	510	
3	Duodenoscope		60	110	115	115	

3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No. 1	No. 2	No. 3	No.4	No. 5
1	Gastroscope	PUD	Gastritis	Varices	Ca Stomach	Ca Oesophagus
		420	408	300	84	48
2	Colonoscope	IBD	Ca Colon	Ulcer, Erythema	Haemorrhoids	Polyp
		120	48	36	24	12
3	Duodenoscope	Ampullary Growth	Choledocholithiasis	Colangiocarcinoma	Billiary Stenting	
		48	48	12	24	

4) Condition of the room and patient care

No.	Equipment	Space of the room	Cleanliness of the room	Patient privacy	Disinfection	Waiting space	Comments
1	Gastroscope, duodenoscope & colonoscope	Not adequate	satisfactory	Yes	Yes	Satisfactory but not adequate	

5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Professor		6	
2	Associate Professor		4	
3	Assistant Professor		1	

6) Percentage of patient getting service (per month)

NO.	Equipment	Investigation advised	Investigation done	Patient did not avail test after advise due to various reason
1	Endoscopy	800-1000	350-400	60%
2	Colonoscopy	500-600	200-250	60%
3	ERCP	600-800	150-200	60%

7) Comments (Findings from Observation and Interview)

It is very difficult to provide the medical facilities in time as there is only one Endoscopy machine functional out of three. In spite of having skilled manpower, patients cannot be treated due to shortage of equipment. If sufficient medical equipment can be ensured then it would be possible to diagnose and treat more number of poor patients in time.

### (3) Cardiology (Cath-Lab)

#### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Coronary Angiogram Machine	1	Phillips	Philips(Allura CV20 722031-160)		
2	Coronary Angiogram Machine	1	Siemens	Siemens ANGIOSTAR		
3	Coronary Angiogram Machine	1	Siemens	Siemens ANGIOSTAR		

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	angiogram	1,351	1,491	1,608	1,953	2,269	
2	ECG	22,504	25,004	28,503	32,312	36,550	
3	Echocardiogram	7,138	7,299	9,568	11,215	13,051	
4	ETT	866	925	1,155	1,109	1,317	
5	Holter				84	121	

#### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Angiogram	CAG	PTCA	PPM	PTMC	TPM	
		1,560	474	48	35	25	

#### 4) Condition of the room and patient care

No.	Equipment	Shield of the room	Cleanliness of the room	Console	Patient privacy	Waiting space	Comments
1	Angiogram	Present	Satisfactory		Yes	Satisfactory	
2							
3							

#### 5) Comments (Findings from Observation and Interview)

This department of this hospital is well organized and highly equipped. But if a pathology lab can be established in each cath-lab, it would be more efficient and enriched.



## GAZIPUR DISTRICT HOSPITAL

Date of survey: 30/06/2014

### At a glance

#### (1) Overview

Level	Secondary
Location	Gazipur, Dhaka
Population in district	3,180,674
Year of established	
No. of beds	100
No. of OPD	157,096
No. of Emergency	43,681
No. of admission	15,366
Bed Occupancy Rate (%)	72.92

Source: Local Bulletin 2013, Census 2011



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	Other and unspecified gastroenteritis and colitis of infectious origin	12.97%	1	Birth asphyxia, unspecified	19.05%
2	Assault by bodily force	10.03%	2	Pneumonia, unspecified	11.43%
3	Person injured in unspecified motor-vehicle accident, traffic	8.52%	3	Injury of blood vessels of head, NEC	9.52%

Source: Local Bulletin 2013

#### (2) Health services

##### 1) Department

Blood transfusion	○	General Surgery	○	Orthopedic surgery	-
Burn Unit	-	ICU	-	Pediatrics	○
Cardiology	-	Internal Medicine	○	Pharmacy	○
Cath-lab	-	Nephrology	-	Physical medicine	-
CCU	-	Neurosurgery	-	Psychiatry	-
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	○	Nuclear medicine	-	Radiotherapy	-
ENT & HN Surgery	-	OBGY	○	SCANU	-
Gastroenterology	○	Ophthalmology	○	Urology	-

##### 2) Service Hour

OPD	8:30 – 14:00 (Sun – Thu)	Emergency	24/7
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#### (3) Hospital Management

##### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

Source: Interview with Director of the Hospital

## 2) Human resources

Manpower	Sanctioned	Filled	Comments
Physician	18	17	
Nurse	40	40	
Medical Assistant	0	0	
Medical Technologist	3	3	1 laboratory technician

Source: Local Bulletin 2013

## 3) Medical waste management

Availability of Incinerator	N/A
Separation of wastes	N/A
Process of waste disposal	N/A

## By Department

### (1) Radiology and Imaging

#### 1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-Ray machine(100mA)	1	ACOMA	KXR 100-FR	1987	
2	Digital X-Ray machine	1	VILLA medical system	ENDOS AC/ACP	2007	Not installed
3	C-arm	1	ALLENTERS			Not installed
4	USG machine	1	Mindray			

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	X-Ray machine	3,458	4,233	6,582	6,955	6,678	
2	USG machine		458	642	838	1,085	

#### 3) Number of patients examined by Type of Test/Main Diagnosis

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	X-Ray machine	chest	Fracture	Others			
		50%	30%	20%			
2	USG machine	pregnancy profile	W/A	U/A	L/A	Others	
		40%	30%	15%	10%	5%	

#### 4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No	No	No	No	No	
2	USG	-	-	-	Yes	No	

#### 5) No. of staff in the department

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist	4	1	1 associate professor
2	Medical technologist	3	1	

#### 6) Comments (Findings from Observation and Interview)

Gazipur Sadar Hospital is upgrading into 500 bedded hospital but there is very poor condition of medical equipments in comparison to no of patints. As the construction work is going on so they need to stop most of the deparments. They have only one DR machine which is not started yet & only one X-Ray machine is about 27years. They have only one USG machine so it is very diffculty to support approximate 200 patients per day. They told us that they have already sent a copy of demand list to DG health. As also repairing & reconstruction of old building goinon so they have to stop X-Ray transiantly but USG is goingon. New X-Ray room is sufficiently big but USG room is very small. There is no separate waiting room for the patient.

(2) Gastroenterology

They have gastroenterology department but it is not well developed. They have no separate room for endoscopy & no endoscopy machine. They have patient who may need endoscopy or colonoscopy but due to lack of facilities they refer them to other hospital having the facility. They have plan to establish a modern & well equipped endoscopy room.

(3) Cardiology (Cath-Lab)

They have no such Cardiology department so they refer patients to other hospital having such facilities. There is only one associate prof. no cath lab & no angiogram machine. They have plan for establishing cath lab, CCU, ICU in the ongoing new building.

(4) Laparoscopic surgery

1) List of Equipment

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	Laparoscope	1	STORZ,Telecam SL-2	Telecam SL-2	2006	

2) Number of patients treated by equipment

No.	Equipment	2009	2010	2011	2012	2013	Comments
1	Laparoscope	22	35	68	75	82	

3) Number of patients treated by Main Diagnosis/Department

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	Laparoscope	Lap cholecystectomy	Others				
		90%	10%				

4) Condition of the OT room

No.	Equipment	Space	Cleanliness of the room	Sterilization	Recovery room	Remarks
1	Laparoscope	Not sufficient	Not adequate	Yes	Yes	

5) Comments (Findings from Observation and Interview)

There is only one laparoscope machine but patients no is increasing day by day. OT room is not so spacious. Need more maintainance, ventrilation system & more instruments.

## MANIKGANJ DISTRICT HOSPITAL

**DATE OF SURVEY:**25/06/2014

At a glance

### (1) Basic Information

Level	Secondary
Location	Manikganj, Dhaka
Population in division	1,388,076
Year of established	1980
No. of beds	100
No. of OPD	157,170
No. of Emergency	27,776
No. of admission	17,741
Bed Occupancy Rate (%)	141.0%

Source: Local Bulletin 2013, Census 2011



TOP 3 diseases patients admitted			TOP 3 diseases of patient deaths		
1	Assault by sharp object	1,142	1	Birth asphyxia	82
2	Diarrhoea and gastroenteritis of presumed infectious origin	994	2	Other cerebrovascular diseases	50
3	Injury of unspecified body region	755	3	Chronic renal failure	20

Source: Local Bulletin 2013

### (2) Health services

#### 1) Departments

Blood transfusion	○	General Surgery	○	Orthopedic surgery	-
Burn Unit	-	ICU	-	Pediatrics	○
Cardiology	○	Internal Medicine	○	Pharmacy	○
Cath-lab	-	Nephrology	○	Physical medicine	-
CCU	-	Neurosurgery	-	Psychiatry	-
Clinical Laboratory	○	NICU	-	Radiology & Imaging	○
Dermatology	-	Nuclear medicine	-	Radiotherapy	-
ENT & HN Surgery	○	OBGY	○	SCANU	-
Gastroenterology	-	Ophthalmology	○	Urology	-

#### 2) Service hour:

OPD	8:30 – 14:00 (Sun – Thu)	Emergency	24/7
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### (3) Hospital management:

#### 1) Budget & Expenditure

Budget	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A
Expenditure	FY2011-2012	FY2012-2013	FY2013-2014
N/A	N/A	N/A	N/A

2) Human resources:

Manpower	Sanctioned	Filled	Comments
Physician	21	20	
Nurse	52	52	
Medical Assistant	18	15	
Medical Technologist	25	24	

3) Medical waste management (observation):

Availability of Incinerator	No
Separation of wastes	Yes
Process of waste disposal	Wastes are separated in different colored plastic bin in different wards. From there it is collected by sweepers allocated by the hospital & then it was shifted to city corporation waste management van that comes to the hospital each day. City corporation staff dumps those as garbage along with household and general waste material.

## **BY DEPARTMENT**

### (1) Radiology and Imaging:

#### 1) List of Equipment:

No.	Equipment	Amount	Manufacturer	Model	Production year	Comments
1	X-ray machine 500mA	1	SHIMADZU	ED1501	1985	Non-repairable & need to be replaced.
2	X-ray machine portable 100mA	1	ALLEGERS	100APR/CBM	-	
3	USG machine	3	MINDRAY	-	2013	Other 2 are non functional and need to be replaced.
4	Dental X-ray unit	1	-	-	-	It is functional but not operated due to lack of film

#### 2) Number of patients examined by equipment

No.	Equipment	2009	2010	2011	2012	2013	Remarks
1	General X-ray	N/A	5147	5,137	4,861	4,838	
2	USG	N/A	Machine was non-functioning	474	245	1,820	

#### 3) Number of patients examined by type of test/main diagnosis (2013)

No.	Equipment	No.1	No.2	No.3	No.4	No.5	Comments
1	General X-ray	CXR	L/S spine	Joints & Limbs	PNS	Abdomen	
		1,935	1,451	968	290	194	
2	USG	Whole Abdomen	Pregnancy profile	Musculoskeletal system	KUB	Others	
		728	546	273	182	91	

#### 4) Condition of the room and patient care by equipment

No.	Equipment	Shield of the room	Shield of the door	Protection	Patient privacy	Waiting space	Comments
1	X-ray	No, except wall thickness	Yes	Yes	Yes	Inadequate	
2	USG	No	Yes	Yes	Yes	Inadequate	

#### 5) No. of staff in the department:

No.	Position/ Profession	Sanctioned	Filled	Comments
1	Radiologist		2	One is consultant & another one is medical officer.
2	Technologist		3	One is permanent & others are deputed.

6) Comments (Findings from observation and interview)

In this hospital, there is no MRI, CT scan, Mamography, 3D or 4D USG & colour doppler machine.

In Radiology department there is only one X-ray machine (portable) and a USG machine. The department is only running by a consultant radiologist and three radio technologists. So this is quite difficult to run this department smoothly by these lack of manpower & instrument.

(2) Gastroenterology

In this hospital, there is no separate department for gastroenterology.

(3) Cardiology (cath-lab)

There is no Cath-Lab in this hospital. So they don't have any angiogram machine. They have a C-arm machine in there OT which is not installed.

(4) Laparoscopic surgery:

In this hospital there is no laparoscopic machine allocated by the hospital fund rather a machine is provided by a physician from his personal source. So it is the time of demand to provide a laparoscopic machine urgently as well as fully qualified manpower.



Annex 10: List of Equipment Provided by SMPP 2

Project: Safe Motherhood Promotion Project (Phase 2)

Duration of Review: July 2011 ~ 30 June 2013

Fiscal Year 2011(July, 2011 ~ March, 2)

#	Description/ Name of Equipment	Qty	Place Assigned
1	Curtain	16	Satkhira Sadar Hospital
2	Bucket with lid	16	Satkhira Sadar Hospital
3	Plastic Container	110	Satkhira Sadar Hospital
4	Magazine file	50	Satkhira Sadar Hospital
5	Book- shelf	1	Satkhira UHC Debhata
6	IPS 600W	1	Satkhira UHC Dshamnagar
7	IPS1200W	1	Satkhira UHC Kularon

Fiscal Year 2012

#	Description/ Name of Equipment	Qty	Place Assigned
1	ANC/PNC table	15	Satkhira 14x FWCs, 1x SC
2	Anesthesia machine	2	Satkhira 5x UHCs
3	Autoclave machine (large)	5	Satkhira 4x UHCs, 1x MCWC
4	Baby scale	2	Satkhira 1x UHC
5	Baby sucker machine	2	Satkhira 1x UHCs, 1x MCWC
6	Baby tray	4	Satkhira 2x UHCs, 2x FWC
7	Baby weight machine	4	Satkhira 4x UHCs, 1x MCWC, 1xFWC
8	BP Machine & stethoscope	21	Satkhira 14x UHCs, 4x FWCs
9	Breast feeding information board	1	Satkhira 1x MCWC
10	Caesarean Section set	12	Satkhira 8x UHCs, 1x MCWC, 3x sadar H.
11	Citizen oharter information board	34	Satkhira 7x UHCs, 2x MCWC & SCs, 23x FWCs
12	Delivery set	6	Satkhira 6x FWCs
13	Delivery table	3	Satkhira 1x UHC, 1x MCWC, 1xFWC
14	Diathermy machine	1	Satkhira 1x UHC
15	Display board	24	Satkhira 2x UHCs, 1x SCs, 21 FWCs
16	Display board (Distriot)	1	1x CS office
17	Doator list board	1	Satkhira 1x UHC
18	Duty roaster board	6	Satkhira 6x UHC
19	EOC Information board	1	Satkhira 1x UHC
20	Episiotomy set	1	Satkhira 1x UHC
21	Fetal monitor (Doppler)	3	Satkhira 2x UHCs, 1x SCsMWC
22	Flow chart	1	Satkhira 1x UHC
23	Framed poster	390	Satkhira 130x UHCs, 20x MCWCs & SCs
24	Height & weight scale	1	Satkhira 1x FWC
25	Instrument trolley	3	Satkhira 1x UHC, 2x FWCs
26	IPS 1200W	8	Satkhira 4x UHCs, 2x MCWCs, 1x SH, 1x Chougaoaha UHC
27	IPS 600W	3	Satkhira 3x UHCs, 1x SH,
28	Lifter	2	Satkhira 2x UHCs

29	Medicine list board	10	Satkhira 8x UHCs, 2x FWCs
30	MR Syringe set	2	Satkhira 2x UHCs
31	Mucous sucker	2	Satkhira 2x UHCs
32	Nebulizer Machine	2	Satkhira 2x UHCs
33	Normal delivery set	6	Satkhira 3x UHCs, 2x MCWC, 1x SC
34	OT light bulb	16	Narsingdi District Hospital
35	Oxygen, Nitrous gas with cylinder	4	Satkhira 4x UHC
36	Partograph board	1	Satkhira 1x UHC
37	Patient report board	4	Satkhira 4x UHCs
38	Performance board	5	Satkhira 5x UHCs
39	Pieture board	1	Satkhira 1x UHC
40	Pulse Oxymeter	1	Satkhira 1x MCWC
41	Soreen	1	Satkhira 1x FWC
42	Spot light	5	Satkhira 3x UHCs, 2x MCWC, 1x FWC
43	Spot light bulb	4	Satkhira 4x UHC
44	Sterilizer	2	Satkhira 1x UHC, 1x MCWC
45	Thermometer	3	Satkhira 3x FWCs
46	Tonsillectomy scissor	4	Satkhira 4x UHC
47	Trolley for gas cylinder	4	Satkhira 4x UHC
48	UHFPO honor board	1	Satkhira 1x UHC
49	Vento's machine	2	Satkhira 1x UHC, 1x MCWC
50	Wall fan	1	Satkhira 1x SC
51	Wall information writing	1	Satkhira 1x MCWC
52	Weighting scale (adult)	4	Satkhira 3x UHCs, 1x MCWC

Fiscal Year 2013 (~June30)

#	Description/Name of Equipment	Qty	Place Assigned
1	Ambu bag (Neo)	9	3 x Narshingdi UHC Raipura 3 x Narshingdi UHC Belabo 3 x Narshingdi UHC Monohardi
2	Battery for IPS	8	Narsingdi District Hospital
3	Fetal doppler	1	Narshingdi MCWC
4	IPS 1200W	1	Satkhira UHC Assasni
5	Mucus extractor	9	3 x Narshingdi UHC Raipura 3 x Narshingdi UHC Belabo 3 x Narshingdi UHC Monohardi
6	NG tube for feeding	30	10 x Narshingdi UHC Raipura 10 x Narshingdi UHC Belabo 10 x Narshingdi UHC Monohardi
7	Radiant Warmer (Open care system)	3	1 x Narshingdi UHC Raipura 1 x Narshingdi UHC Belabo 1 x Narshingdi UHC Monohardi

8	Room thermometer	9	3 x Narshingdi UHC Raipura 3 x Narshingdi UHC Belabo 3 x Narshingdi UHC Monohardi
9	Spot light for labor room	6	2 x Narshingdi UHC Raipura 2 x Narshingdi UHC Belabo 2 x Narshingdi UHC Monohardi
10	Steam sterilizer	5	3 x Narshingdi UHC Belabo 2 x Narshingdi UHC Monohardi
11	Sucket machine (foot operation)	6	2 x Narshingdi UHC Raipura 2 x Narshingdi UHC Belabo 2 x Narshingdi UHC Monohardi
12	Weighing Scale for neonates	4	2 x Narshingdi UHC Belabo 2 x Narshingdi UHC Monohardi
13	Wheel chair	1	Narshingdi MCWC