

Nick Simons Institute(NSI)

What does it take to build a biomedical workshop?
Its relevance, use, and NSI's experience

Bikash Shrestha
Deputy Director, NSI

INSPIRE 2025 Health Forum
8th July 2025

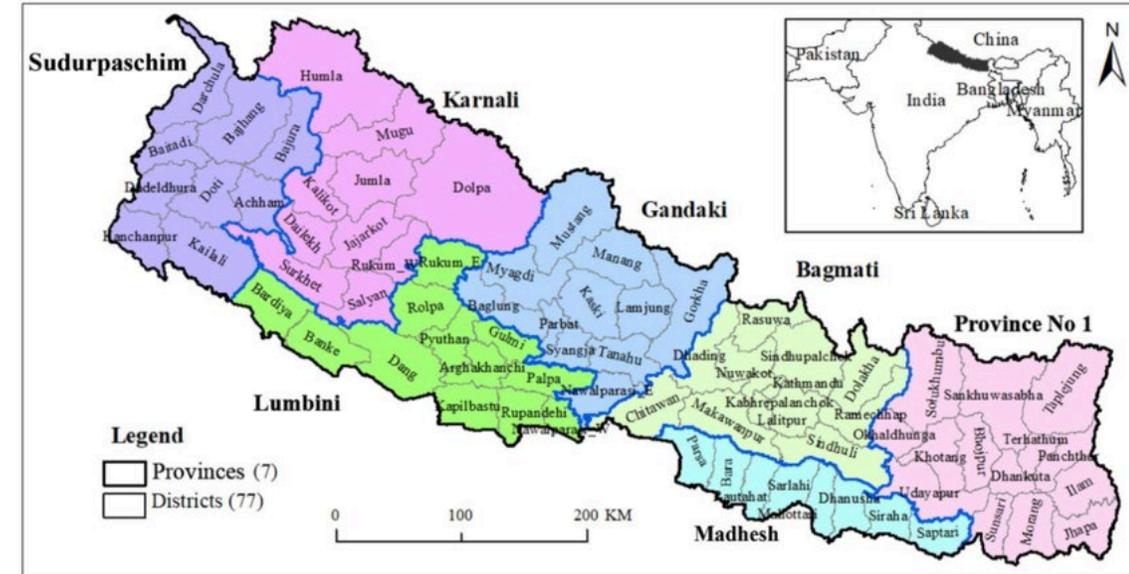
- 1. An Overview of Nepal**
- 2. Nepal Government's Health System**
- 3. Nick Simons Institute and it's programs**
- 4. Biomedical Equipment Technician Program**

An Overview of Nepal

- **Population:** 30 million
- **MMR:** 151 per 100,000 live births
- **Neonatal mortality:** 21 per 100,000 live births
- **Infant mortality:** 23 per 100,000 live births
- **Life expectancy:** 69 for men, 72 for women
- **Literacy rate:** 81% (male) 63% (female)
- **Per capita GDP:** \$1336

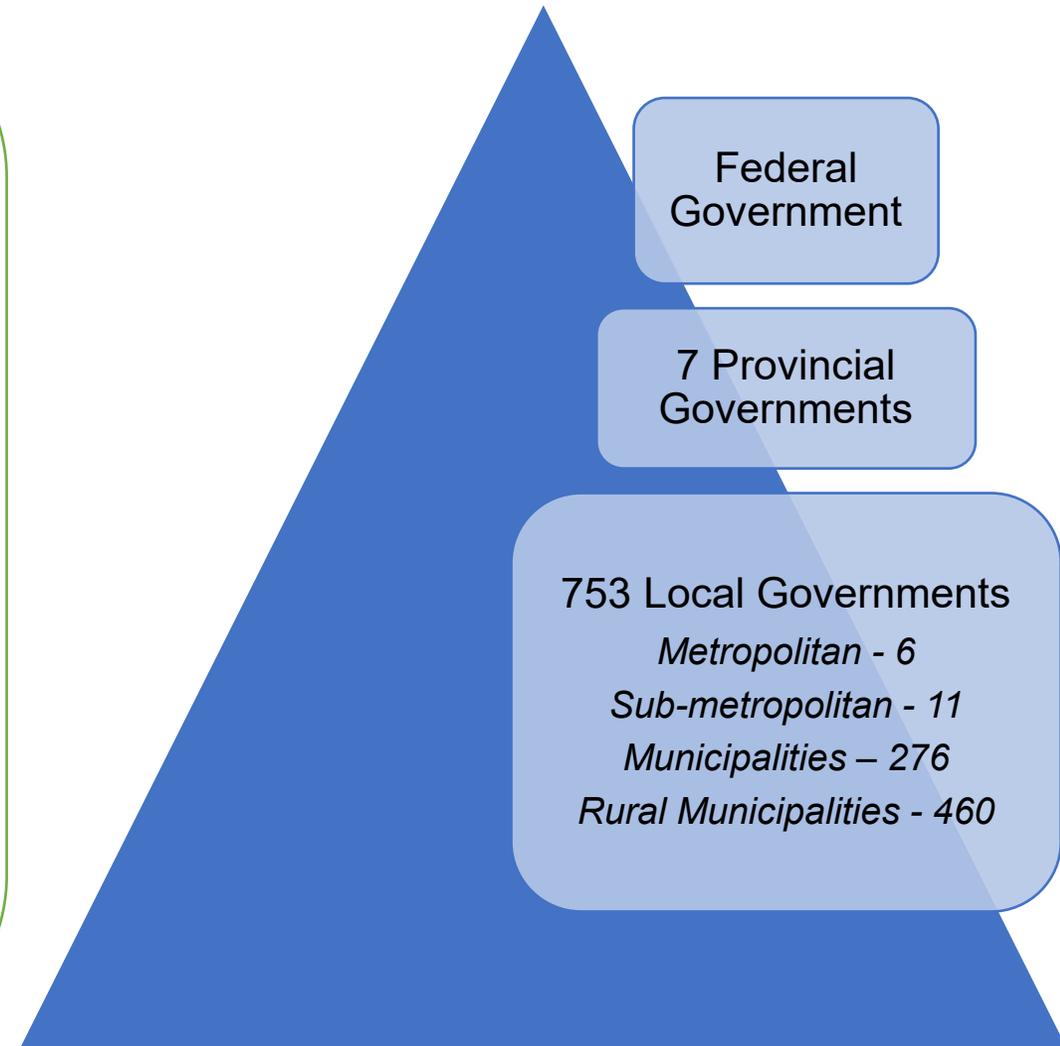
[National Report | National Population and and Housing Census 2021 Results](#)

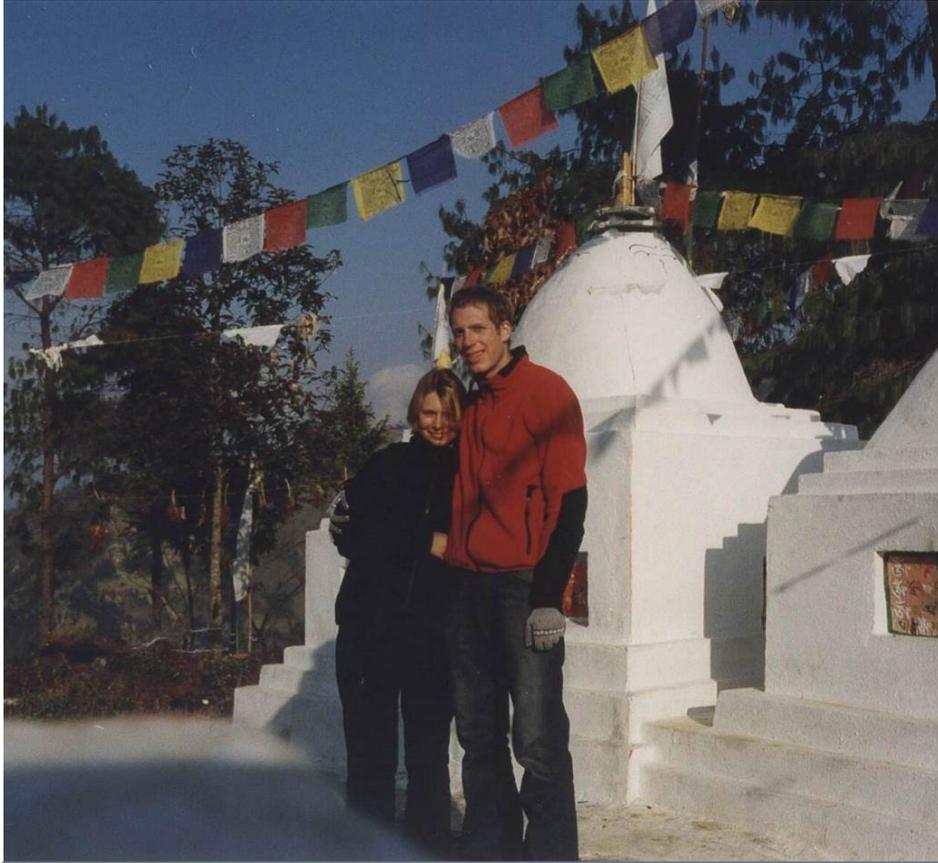
Nepal Demographic and Health Survey 2022 Key Indicators Report Ministry of Health and Population New ERA Ministry of Health and Population [Internet]. Available from: <http://www.mohp.org.np;>



Health system of Nepal

- Nepal entered from its unitary system into a new “Federal democratic system” on 17th September 2015
- Article 35 of the Constitution of Nepal, enshrines the right to health as a fundamental right for all citizens
- The Ministry of Health and Population at the central level, the Ministry of Social Development at the provincial level and the health section or health department under the local government





Nick Simons



Simons Family

NSI is a Nepal based NGO funded by the Simons family in New York

NSI MISSION & VISION

● Mission

To innovate solutions in rural healthcare through training and hospital support, and to advocate for their scale up with the Government of Nepal

● Vision

People in rural Nepal receiving quality healthcare services within their own communities



NSI SUPPORTED SITES



NSI's Focus Areas

Training

**Curative Service
Support
Program**

**Hospital
Strengthening
Program**

**Monitoring,
Evaluation,
Advocacy and
Learning**

Long Duration Training Programs

- Diploma in Biomedical Equipment Engineering (DBEE) Management
- Anesthesia Assistant Course (AAC)
- Skilled Birth Attendant (SBA)
- Advanced SBA
- Mid Level Practicum
- Operation Theatre Technique and management

Short Duration Training Programs

- Primary Emergency Care (PEC)
- Essential Critical Care Training (ECCT)
- Clinical Training Skills (CTS)
- BMET Training Program:
 - Medical Lab Technicians
 - X-Ray Technicians
 - Hemodialysis Equipment Maintenance

Support to Hospitals



Human Resource Components



Nurses



Medical Officers



MDGP

**Anesthesia
Assistants**



Biomedical Equipment Technicians

Biomedical Equipment Technician Program



**Biomedical Equipment Technician (BMET) Training Program
Developed in coordination with the Government
18-month program for High school graduates**

Trained on:

- Basic Electrical and Electronics
- Human Anatomy and Physiology
- Basic concept of Mechanical engineering
- Biomedical Equipment instrumentation and Maintenance

Skill Set:

- Preventive maintenance
- Calibration and testing
- Troubleshooting guide

Placement:

- Government hospitals
- Private sector



Equipment repaired and maintained by BMETs

Lab Equipments

- Microscope
- Water bath
- Incubator
- Chemical Balance
- Autoclave
- Distillation Plant
- Centrifuge
- Pipettes
- CO2 Incubator
- Colorimeter
- Hot air Oven

Image Equipments

- x-ray Machine
- Film processor
- CR System
- Dental x-ray
- Ultra –sound machine
- Mammography unit
- Echocardiogram
- D.R system
- Cath Lab

Cardiac Equipments

- Computerize ECG machine
- Ordinary ECG machine
- Cardiac monitor
- Ventilator
- Pulse Oximeter
- Infusion Pump
- BP machine
- Stethoscope

OT Equipments

- Autoclave HP horizontal/vertical
- Operation table hydraulic/electrical
- OT Light
- Anesthesia machine
- C-Arm
- Ortho/ENT drill
- Laparoscopy System
- Patient monitor

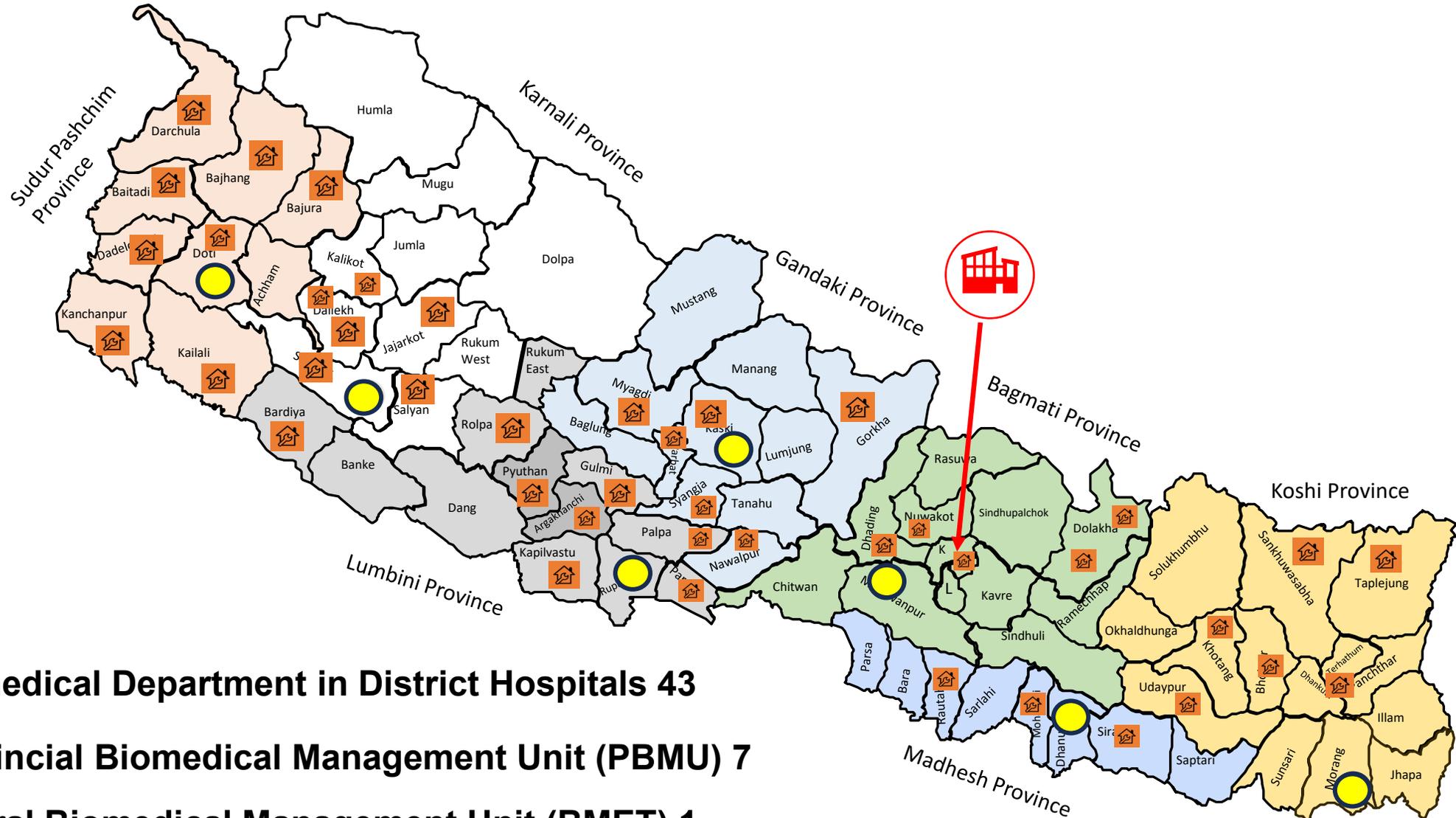
ICU/NICU Equipment

- Ventilator
- Defibrillator
- ABG machine
- Patient monitor
- Syringe pump
- Infusion Pump
- Baby incubator
- Phototherapy unit
- Oxygen concentrator
- Radiant warmer
- Fetal Doppler

Dental Equipments

- Dental chair
- Suction Apparatus
- Cure light
- Scaler
- Compressor

Biomedical Units in Nepal



Biomedical Department in District Hospitals 43



Provincial Biomedical Management Unit (PBMU) 7



Central Biomedical Management Unit (BMET) 1

NSI supports to Biomedical Equipment Technician Program

1. Set up a training facility
2. Help establish hospital and provincial Biomedical Labs
3. Place BMETs in hospitals and provincial Biomedical Labs
4. Provide testing and calibration equipment and spare parts.
5. Digitalize the tracking of equipment and their condition.
Biomedical Equipment Management Information System (BEMIS)



Testing and Calibration Equipment

SN	Name of the testing device	Testing equipment objectives	Test performed by
1	Electrical Safety Test	Ensuring electrical safety of medical devices	Trained Biomedical Engineer / Biomedical Technician on testing and Validation
2	Anesthetic Gas Analyzer	Monitoring and analyzing anesthetic gas concentrations during surgeries	
3	Patient simulator +SPO2 light	Simulating physiological parameters to test and calibrate patient monitors.	
4	Electrosurgery Analyzers	Testing and verifying the performance of electrosurgical units	
5	Infusion pump analyzers	Measuring and calibrating the flow rate of infusion pumps	
6	Ventilators gas analyzers	Testing and validating ventilator performance	
7	Oxygen Analyzers	Measuring oxygen concentration in various settings	
8	Defibrillator Analyzer	Testing and calibrating defibrillator functionality.	
9	Ultrasound Phantom	Simulating tissue characteristics for ultrasound equipment testing and training	
10	X-ray Analyzers	Measuring the KVP , mA and Dose of the X-Ray equipment	



Biomedical Equipment Management Information System (BEMIS)





Logout

Dashboard

Home / Dashboard

Welcome back, **Narayan Thapa!** Your login from IP address [27.34.67.44] has been successfully authenticated.

BMU PERFORMANCE INDICATOR (SINCE FY 2080/81)

2941

Equipment Received for Maintenance

2709

Equipment Dispatched

232

Equipments in the BMU

1134

Preventive Maintenance Equipment

0

No idle equipment found in the last 6 months.

Status **Hospitals** Contacts

EQUIPMENT IN THE HOSPITALS


11569

Hospital	W	N	NI	WN	NR	T
District Hospital Bajura	161	21	0	3	1	186
Provincial Hospital, Siraha	14	3	0	2	0	19
Dadeldhura Hospital	299	14	149	22	1	485
District Hospital Achham	107	10	3	4	3	127
District Hospital Baitadi	152	11	48	26	20	257
District Hospital Darchula	84	6	38	0	2	130
Manang Hospital	33	2	2	8	6	51

Status **BMUs** Contacts

EQUIPMENT IN THE BIOMEDICAL UNITS

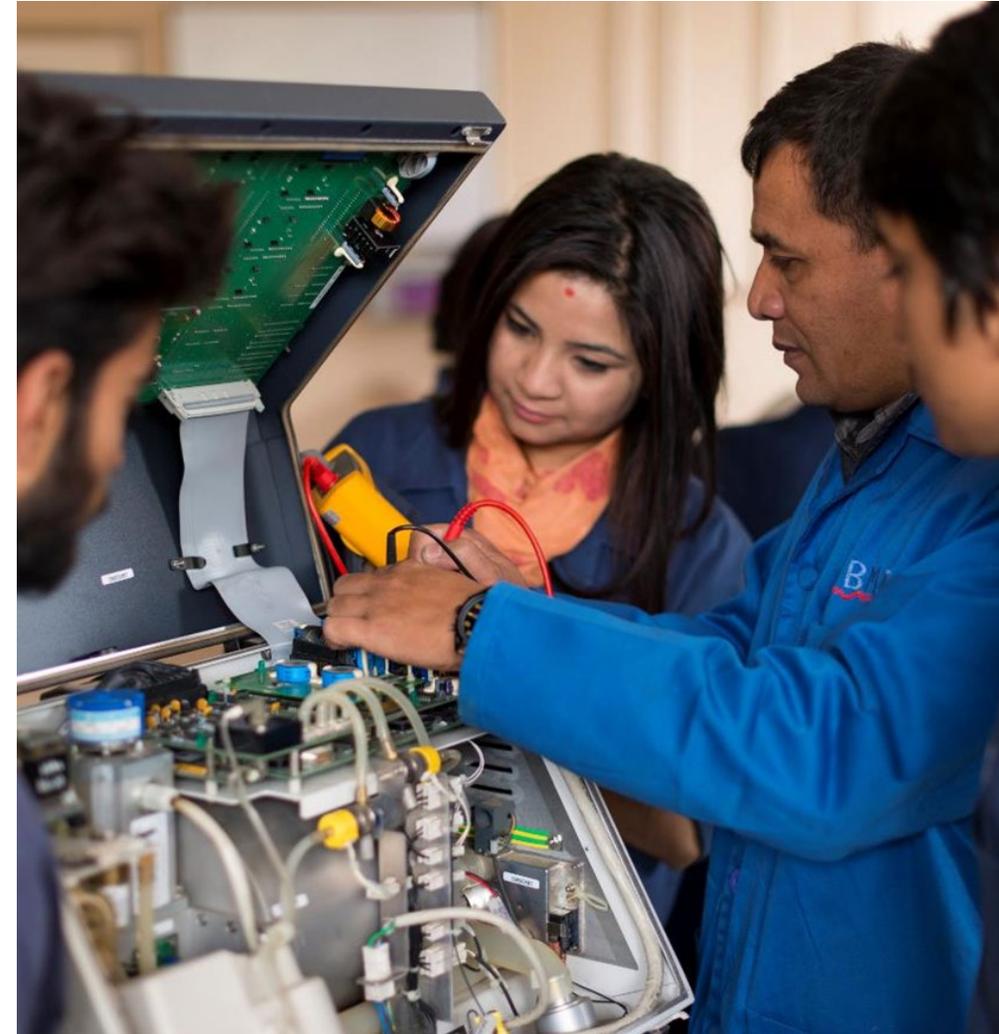

232

BMU	R	RP	RD	RE	T
Siraha District Hospital Workshop	2	10	1	0	13
Parbat Hospital, Biomedical Unit	1	2	0	0	3
PBMU, Lumbini Province	0	18	2	0	20
Rolpa hospital, HBU	1	9	0	0	10
Biomedical Central Workshop	11	5	15	0	31
Arghakhanchi hospital, HBU	0	3	1	0	4
Baitadi District Hospital, Biomedical unit	1	8	0	0	9

PREVENTIVE MAINTENANCE SCHEDULES

Equipment	PM Date	View
Electrolyte Analyzer	2075-09-01	
Patient Monitor	2077-06-01	
BiPAP Machine	2080-02-19	
Oxygen Concentrator	2080-03-18	
Oxygen Concentrator	2080-03-18	
Ultra Sound Machine (USG)	2080-04-20	
Diathermy	2080-05-02	
Ultra Sound Machine (USG)	2080-05-02	

- Sanctioned posts for BMETs in the government system.
- Hospitals setting aside funds for the operations of Biomedical Labs.
- Provincial governments establishing Biomedical labs within their structure.
- Biomedical information management systems allows for timely data to strengthen strategic planning, forecasting, and budgeting for equipment management.



Thank You !