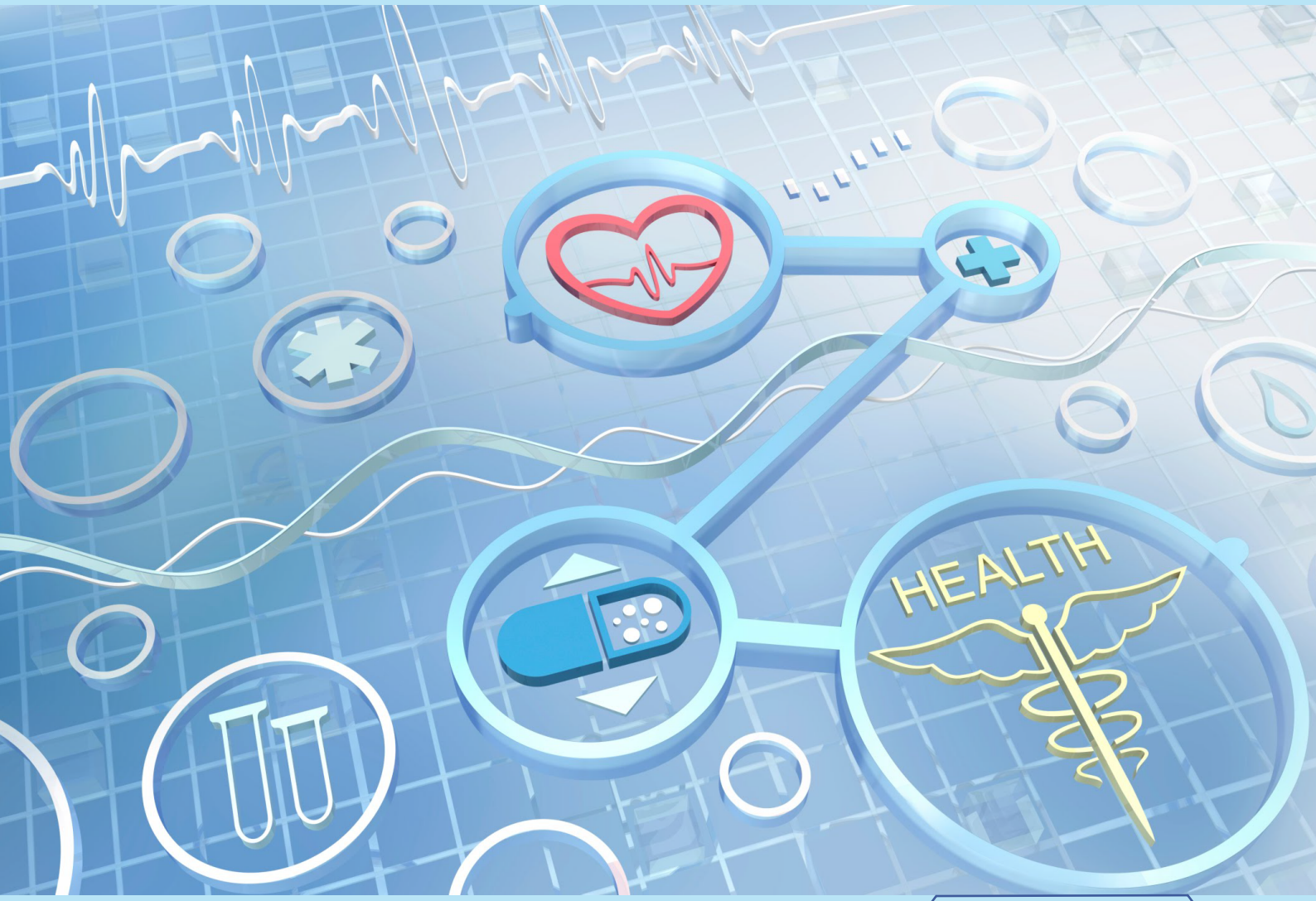
North Eastern Development Finance Corporation Limited

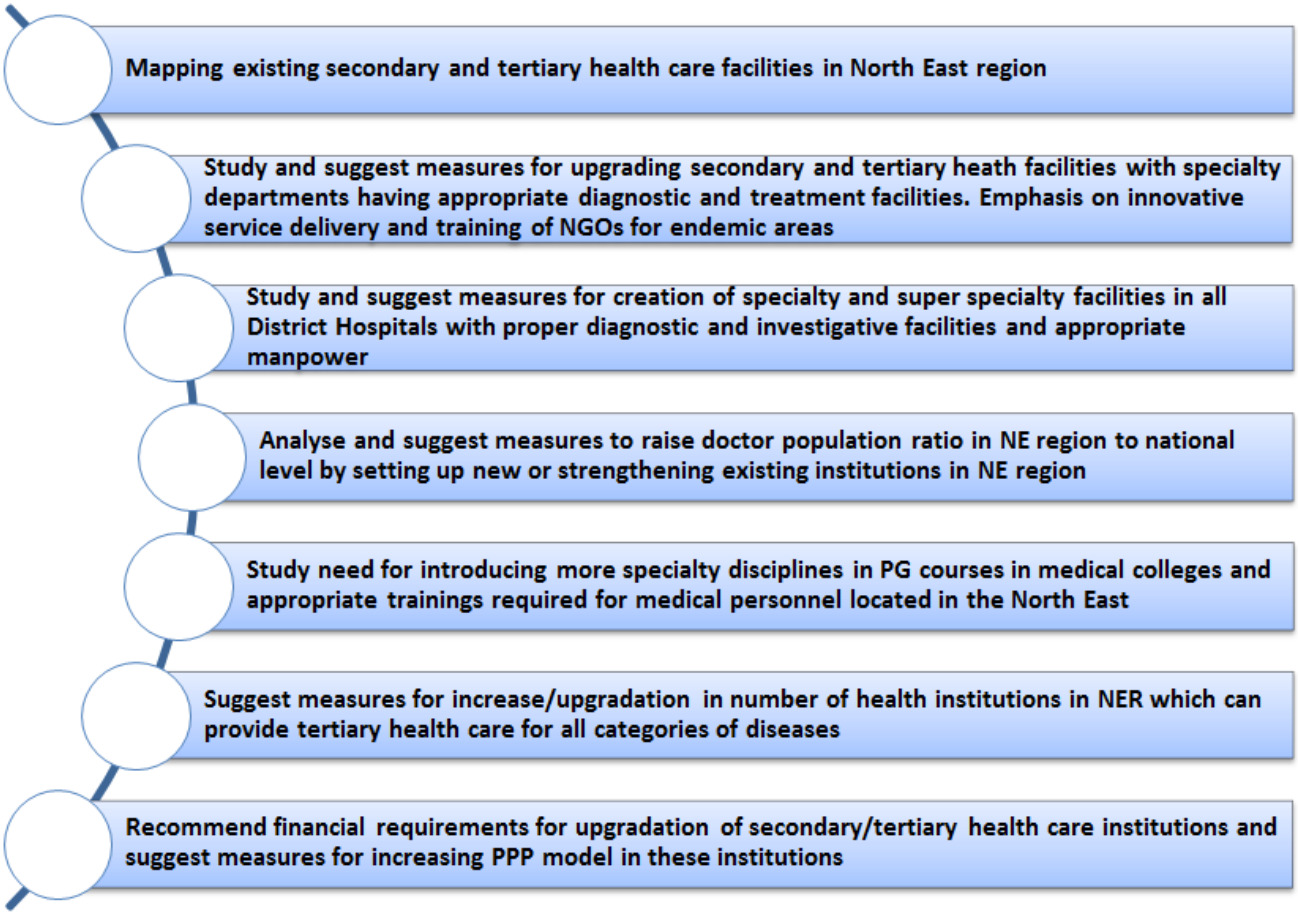


Sutra
Consulting

Regional Plan and Strategy for Up-gradation of Secondary and Tertiary Health Care Facilities in North Eastern Region by 2030

Executive Summary

An assignment was commissioned by the North Eastern Development Finance Corporation Ltd. under its Techno Economic Development Fund for developing a regional plan and strategy for upgradation of secondary and tertiary health care facilities in the North Eastern region by 2030. The scope of work of the assignment is summarized as follows.



The sources of information utilized for the assignment included an appropriate mix of primary surveys and review of secondary documents. The data collection exercise was conducted in two stages.

In the first stage a census was conducted covering all districts in the eight north eastern states. The purpose of the census was to map healthcare and diagnostic facilities and identify key gaps in the health care delivery system state wise, identify model healthcare and diagnostic facilities and design the sample for second stage of data collection.

In the second stage, districts were selected using stratified sampling method. The performance of districts as per the ten assessment criteria included in the first round of data collection served as the basis of stratification[1]. A score was generated for each district based on the criteria and the weightages associated with them. 30 percent of the districts in each state were selected as a representative sample. Districts were categorised as well performing, average performing and poor performing on the basis of the scores. The sample districts were identified from the top scorers of the well performing strata, clustering the median scorers of the average performing scale and from the lower scorers for the poor performing districts. It was ensured that all the aspirational districts of the north eastern states, identified by the NITI Aayog were included in the list of sample districts.

Sample Districts

Arunachal Pradesh- Anjaw, Upper Subansiri, Namsai, Dibang valley Tawan, West Siang, Upper Siang
Assam- Dibrugarh, Karimganj, Dhubri, Sonitpur, Udalgiri, Hailakandi, Baksa, Goalpara, Darrang, Barpeta
Manipur- Thoubal, Bishnupur, Chandel, Ukhrul, Tamenglong, Churachandpur
Meghalaya- South West Garo, Rib hoi, East Khasi Hills
Mizoram- Lunglei, Mamit, Aizawl
Nagaland- Tuensang, Kiphere, Dimapur
Sikkim- West Sikkim, South Sikkim
Tripura- North Tripura, Dhalai, Khowai

Health facilities including Community Health Centres (CHCs), Sub Divisional Hospitals (SDHs), District Hospitals (DHs), State Medical College and institutes and super specialty centres were covered in the second stage of data collection. A summary of facilities covered in the second round of data collection is provided in the following table.

State wise sample facility units covered in second round

State	CHCs	DH	SDH	State Hospital/ Medical College
Arunachal Pradesh	47	17	-	1
Assam	160	26	3	5
Manipur	18	7	-	-
Meghalaya	20	8	-	-
Mizoram	18	8	2	2
Nagaland	27	11	-	-
Sikkim	2	4	-	1
Tripura	27	8	4	1
Total	**319**	**89**	**9**	**10**

The key stakeholders covered in the facilities and other units include Directors of various Departments of Health Services and Medical Education, NHM officials, Hospital Superintendents, Hospital Administrators, Doctors and paramedical staff and health workers. The qualitative and quantitative

[1] Criteria used were Population of the district, Distance of the District Head Quarter from the State Capital, Geographical accessibility of the District Hospital from the State Capital as reported by the administrative staff of the DH, District Hospital - whether all identified specialties are functional, % of CHCs in the district, functional as FRU, % bed occupied at the District Hospital on the day of interview, % of institutional deliveries (ID), Children age 12-23 months fully immunized (BCG, measles, and 3 doses each of polio and DPT) (%),Prevalence of HIV among general population (ANC clinic) and Infant Mortality Rate (IMR)

findings that emerged from the survey were assessed in order to ascertain the gaps in the current health system and formulate an appropriate plan and strategy. Based on the projected population of 2026 and the current status of health facilities expected demand and requirement of health care facilities by 2030 was ascertained. This was used to develop state wise plans and estimates of financial requirements for execution.

Findings and Recommendations

Existing Health Care Infrastructure

A review of the existing healthcare facilities in each of the eight states was conducted. The number of facilities currently existing in each state is summarized in the following table.

Existing Health Facilities across NE States

Facility	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Medical College	1	6	2	-	1	0 (1 coming up in Kohima)	1 (Pvt.)	2
State Hospital	-	-	-	-	2	0	1	6
District Hospital	17	33	9	8	9	11 (Includes NHAK General Hospital/Referral Hospital)	4	6
Sub-Divisional Hospital	-	14	1	-	5	0	-	12
Community Health Centre	47	158	18	27	18	21	2	21
First Referral Unit	1	73	0	0	14	16	3	12
Total	**66**	**284**	**30**	**35**	**49**	**48**	**11**	**59**

A majority of facilities are located in Assam, followed by Arunachal Pradesh and Tripura. Assam is geographically important in the north eastern region and the district hospitals located in the border areas of the state witness heavy footfall by patients from adjacent districts of the neighboring states. This inflow of patients can be accounted for largely due to the inadequacy and uneven distribution of facilities in other north eastern states.

CHCs exist in all districts of Arunachal Pradesh, Assam, Manipur, Meghalaya, and Tripura. Two districts of Sikkim and one district of Nagaland do not have any CHC. However, it was observed that most of the CHCs are not functioning as per IPHS norms and many were not functioning as First Referral Units (FRUs). In fact it was found that no FRUs are in operation in Manipur and Meghalaya.

Almost all districts have a District Hospital (DH), except a few districts in Assam, Manipur, Meghalaya and Tripura. The districts where DHs do not exist are Dibrugarh and Jorhat (in Assam), East Jaintia

Hills, North Garo hills, South West Garo Hills and South West Khasi Hills (in Meghalaya) and West Tripura and Sepahijala districts (in Tripura).

There are very few medical colleges in the NE region. Assam has the most number of medical colleges. These are located in six locations, namely Guwahati (GMCH), Dibrugarh (AMCH). Silchar, Tezpur, Jorhat and Barpeta. There is one medical college in Meghalaya under the Central Government scheme- North Eastern Indira Gandhi Regional Institute Health & Medical Sciences (NEGHRIMS). Nagaland is developing a medical college in Kohima- Nagaland Medical College Kohima (NMCK). Sikkim has one medical college- Sikkim Manipal Institute of Medical Sciences (SMIMS) at Gangtok, which is a private facility. Tomo Riba Institute of Health and Medical Sciences (TRIHMS) located in Arunachal Pradesh started in 2018. The Mizoram Institute of Medical Education and Research (MIMER), is commencing its first ever session from 2018-2019. Mizoram does not have any super-specialty private hospitals as of now.

Projected Requirement of Health Care Infrastructure

The existing number of health facilities is less as compared to the requirement in the eight states. The gap can be met by a combination of two strategies, up-grading existing DHs as Model Hospitals that may house specialists and functional departments and serve as a hub for 3-4 adjoining districts and setting up new units as required. Keeping in mind the requirement of up-gradation of the CHCs and DHs, the requirement for new facilities has been calculated and summarized in the following table.

Number of new health care facilities recommended at Secondary level by 2030

State	CHC	FRU in CHC	Model DH
Arunachal Pradesh	0	5	5
Assam	50	70	5
Manipur	8	2	5
Meghalaya	3	2	5
Mizoram	0	5	5
Nagaland	3	2	3
Sikkim	1	1	0
Tripura	0	5	5
Total	**65**	**92**	**33**

Apart from this, the requirement of setting up of Medical, Paramedical and Nursing Colleges within the states has been estimated to ensure development of sufficient number of quality manpower that can adequately serve the region.

Number of Medical, Pharmaceutical and Nursing colleges at Secondary level by 2030

Colleges	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Medical College	1	10	4	4	2	2	2	5
Pharmaceutical College	2	5	5	1	2	3	4	2
Nursing college	0	20	25	1	5	5	0	0

Colleges	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Satellite Institute - RIPANS	0	0	0	0	0	0	1	0

Requirement for cancer care, mental care and dialysis is rapidly increasing, and available facilities were found to be limited in NE states. This study captured the present number of units providing such services and estimated the requirement in each state. Apart from this, a satellite institute of RIPANS is also proposed for Sikkim for developing quality paramedics.

The study also reviewed state wise disease burden as available in Government records to assess the disease trend. This information was used in planning new wings in DHs, upgradation of facilities and development and deployment of human resources.

Existing and Projected Bed Availability

The study observed that in most of the states, the current number of beds available under the Government health institutions is lesser than the WHO recommended norm of 1.5 beds per 1000 population ratio.

Population bed ratio per 1000 population

State	Ratio
Arunachal Pradesh	1.81
Assam	0.55
Manipur	0.98
Meghalaya	0.6
Mizoram	3.5
Nagaland	0.5
Sikkim	2.6
Tripura	0.87
India	0.54
WHO Recommended	1.5

(Source: Field Survey Data)

Bed per 1000 population ratio in Mizoram and Sikkim are relatively much better in comparison to other north eastern states and higher than the national average. The ratio is poorest in Nagaland and Meghalaya. It was found that Arunachal, Assam, Mizoram, Sikkim and Tripura do not have shortfall in bed population ratio. However, each state would need to increase its bed strength considering the population projection for 2026 and beyond.

Existing and Projected Human Resource Requirement

Globally, there are 13 physicians available per 10,000 population, with large variations across countries and regions. As per the Annual Report 2018 of the Health Intelligence Bureau of India, the availability of physicians in India in 2017 was 10, 41,395 for a population of 1,210,854,977 (Census 2011). This

implies 8.6 physicians per 10,000 population which is less by around 5 physicians compared to the globally accepted standard. The figures in case of the North Eastern states were found to be even lower.

Existing Physician population ratio per 10000 population

State	Ratio
Arunachal Pradesh	5.3
Assam	2.3
Manipur	2.4
Meghalaya	2.3
Mizoram	2.3
Nagaland	4.1
Sikkim	3.5
Tripura	2.7

(Source: Field Survey Data)

The lack of Specialist Doctors in CHCs is another major problem which is shared by all the north eastern states and results in high referral rates outside the districts leading to higher out of pocket expenses. The requirement of human resources by 2030 has been calculated in view of the projected population by 2030 and existing availability of medical human resources.

Additional Human Resources required by 2030

Human Resources	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Medical and Health Officer (MBBS)	200	823	-	281	304	313	38	492
Surgeon or General Surgery	34	83	19	26	22	16		34
Physician or General Medicine	0	-	0	1	-	6		14
Gynecologist	67	40	35	40	67	20		57
Anesthetist	39	86	19	15	63	10		37
Pediatrician	36	8	14	17	37	13		26
Ophthalmologist or Eye Specialist	55	97	23	31	21	30		22
Orthopedic Surgeon	14	32	6	6	-	4		8
Psychiatrist.	18	12	6	5	14	9		7
E.N.T. Specialist	11	-	7	8	10	1		3
Dermatologist	18	39	5	11	10	10		16
Pathologist	36	56	14	19	38	13		8
Microbiologist	17	38	7	11	10	10		3
Radiologist	9	14	-	9	15	8		11
Cardiology(Spl/Sr.Spl)	0	-	0	0	-	0		0
Oncology (Spl/Sr.Spl)	0	-	0	-	-	0		0
Dental Surgeon	0	-	-	-	5			0

Human Resources	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Pharmacist	274	-	-	62	253	64	50	0
Staff Nurse	1802	1726	442	675	1600	467	120	0
A.N.M./MPW(M&F)	750	552	191	-	1630		99	1102
LHV	1865	2171	165	1330	111	1522	472	251
Laboratory Technician	138	258	183	194	357	95	49	114
X-Ray Technician/Radiographer	130	243	36	54	72		3	2

(Source: Field Survey Data)

All the states are found to struggle due to unavailability of trained manpower as appointed resources are often unwilling to serve in remote areas owing to geographical, social and economic considerations. To fill up the gaps states have opted for appointment of physicians on contract basis in Government medical services under the National Health Mission (NHM). However this too is difficult as stakeholders shared that doctors are reluctant to join as contractual workers in even for lucrative salaries. This is primarily because they want job security and would be prepared to be deployed at remote locations as long as they are assured of permanent positions.

Since dearth of human resource is one of the main reasons for the non-functional status of various wings in Government hospitals, appropriate HR policies which are perceived to be pro-employee need to be in place thus leading to a reduction in attrition rates. Transparency in policies including criteria for promotion and benefits for doctors working in rural areas are necessary. In this context it is to be mentioned that Mizoram does not have a specific HR policy for engagement, promotion and incentives. Regular service doctors are not routinely absorbed as per vacancy.

Training

Training of health professionals is of utmost importance to address the scarcity of human resources. Some states have started emphasizing this, for instance in Assam the Government has started a short term training program for MBBS doctors to address the gap create by lack of specialists. This initiative has been found to quite useful for the state.The study revealed that the nature of human resource problems is similar across states and is mainly related to inadequacy of health professionals, particularly specialists. The training requirement across all the states is therefore quite similar and includes:

- Skill training of MBBS doctors for addressing inadequacy of specialists, specifically in gynecology & obstetrics, anesthesia, pediatrics, basic surgery and ophthalmology, cardiology, cancer screening, dialysis and mental health.
- Training of health personnel on epidemic diseases like malaria, dengue, Japanese Encephalitis, diarrhea and others
- Training of Medical Superintendents, District Health officers and RKS on administration, accounts, and leadership
- Hands on training of staff nurses in PHCs, BPHCs and at DH level in active management of third stage of labour, neonatal resuscitation, maternal complication identification and management
- Training of state and district level doctors, nurses and staff from CHCs/PHCs in injectable contraceptive, utilization of human resource, implementation of PE

programme, modular training, RBSK programme management, training of NPPCD activities, RHD, COPD, and CKD
- Training of health workforce on epidemics and newly emerging infectious diseases

Along with training other HR policies have to be aligned with current market trends so that trained manpower are willing and motivated to serve in the districts. The requirement for modern training facilities has been put up by each state for training of medical officers. Meghalaya proposed two training centres like Regional Resource Centre in Guwahati with Training Coordinators – one at Shillong and another at Tura.

Equipment

A majority of DHs and CHCs do not have the basic equipment required to provide diagnostics and satisfactory healthcare to patients without relying on private healthcare institutions. Most Departments are left non-functional due to lack of infrastructure and equipment along with trained manpower for using the equipment. The requirements as shared by the sample DHs and Medical Colleges has been provided in this Report. In the state wise budget estimates a lump sum amount has been allocated for procuring equipment and each state can identify specific equipment and finalize the budget.

Public Private Partnership

The study explored areas in which partnerships could be forged with private agencies and NGOs to ensure high quality but affordable healthcare. A possible model that could be adopted is with the state providing space and the partner investing in equipment, Human Resource and annual maintenance.

The possible areas for PPP include bio-medical waste management, housekeeping and catering at DHs, toilet/Sulabh Complex for patients and their families, diagnostic centres at DHs (USG, CT Scan and MRI), NCD program, infectious disease laboratory, referral transportation, management of PHCs/BPHCs and FRUs and setting up nursing colleges.

Some of the existing PPP models are found in Manipur and Assam where diagnostics services are being provided in district hospitals. Successful models include Shija Hospital, Sky Hospital, Jeevan Hospital and Christian Hospital. Hospitals are providing free service or services at subsidized rates to the patients who are Below Poverty Line (BPL) and to Economically Weaker Section (EWS) through such partnerships. A case in point is Karuna Trust which has adopted 3 PHCs at Tousem (Tamenglong district), Borobekra (Imphal East district) and Patpuihmun (Churachandpur district).

In Tripura two private partners- ILS Hospital and Public Health Foundation of India are playing significant roles in the health and development of the state. The former provides super specialty healthcare and the latter works for comprehensive Non Communicable Disease Program (NCD) in the state. There is scope for exploring further partnerships with these institutions. Other states, such as Meghalaya and Sikkim could study and adopt the model of Tripura and develop partnerships with Public Health Foundation of India to provide technical support in terms of disease surveillance, screening and case identification from ground level to the DH level.

In Meghalaya, 19 PHCs, 2 CHCs, and the state dispensary are managed by NGOs. The state is responsible for providing resources for management and quality monitoring.

While there is significant of taking forward the PPP model, there has to be adequate focus on stringent monitoring to ensure that processes and activities are transparent and equitable. A possible mechanism for ensuring quality and maintenance of standards is the engagement of a dedicated nodal person for PPP management in the sector.

NGO Involvement

NGOs can play an important role in effective service delivery. They could be engaged specifically in community mobilisation activities that would help control vector borne diseases, Tuberculosis, Anaemia, School Health programs and Oral health programs. District or program specific involvement of NGOs can also be effective.

Gap Analysis

As part of the study a review of major gaps across five parameters, namely requirement for infrastructural upgradation in specialty units, requirement of upgradation in para clinical services, requirement for upgradation in other services, availability of doctors, ANM, nurses and other staffs, and requirement for infrastructural upgradation in super-specialty units was undertaken.

Requirement for infrastructural upgradation in Specialty units

Several infrastructural gaps were observed with respect to specialty units in the District Hospitals that were surveyed. The specialty units covered include general medicine, general surgery, Obstetrics & Gynecology, Paediatrics including Neonatology, Emergency (Accident & other emergency) (Casualty), Critical Care (ICU), Anesthesia, Ophthalmology, ENT, Dermatology and Venereology (Skin & VD) RTI / STI, Orthopedics, Radiology, Dental Care and Public Health Management. Most DHs require major or minor upgradation in all specialty units. It is observed that all specialty units except Public Health Management require major and minor upgradation as well as OPDs and OTs. Absence of a common bank account for various programs has been observed across all states.

Infrastructural Gaps in Speciality Units									
#	**Specialty units**	**Arunachal Pradesh**	**Assam**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Sikkim**	**Tripura**
a.	General Medicine	Major and minor upgradation of building, waiting room and OPD	Major and minor upgradation of building, waiting room and OPD	Minor upgradation of waiting room and OPD, construction of new building unit	Minor upgradation of building, waiting room and OPD	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new OT	Minor upgradation of building, OT and OPD; construction of new waiting room and OT	No response	Major and minor upgradation of building and OPD, construction of new waiting room
b.	General Surgery	Major and minor upgradation of building, waiting room and OPD; construction of new OT	Major and minor upgradation of building, waiting room and OPD; construction of new OT	Minor upgradation of waiting room and OPD, construction of new building unit	Minor upgradation of building, waiting room and OPD, construction of new OT	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new OT	Minor upgradation of building, OT and OPD; construction of new waiting room and OT	Construction of new waiting room	Major and minor upgradation of building and OPD, construction of new waiting room and OT
c.	Obstetrics & Gynaecology	Major and minor upgradation of building, waiting room, OPD and OT; construction of new OT	Major and minor upgradation of building, waiting room and OPD; construction of new OT	Major and minor upgradation of waiting room, OT and OPD; construction of new building unit	Minor upgradation of building, waiting room and OPD, construction of new OT	Minor upgradation of building, waiting room and OPD; construction of new OT	Minor upgradation of building, OT and OPD; construction of new waiting room and OT	Major up gradation of building; construction of new waiting room	Major and minor upgradation of building and OPD, construction of new waiting room and OT
d.	Paediatrics including Neonatology	Major and minor upgradation of building, waiting room, OPD	Major and minor upgradation of building, waiting room and OPD;	Minor upgradation of hospital building, waiting room, and OPD;	Minor upgradation of building, waiting room and OPD	Minor upgradation of building, waiting room and OPD; construction of new OT	Minor upgradation of building, OT and OPD; construction of new waiting	No response	Major and minor upgradation of building and OPD

Infrastructural Gaps in Speciality Units									
#	**Specialty units**	**Arunachal Pradesh**	**Assam**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Sikkim**	**Tripura**
		and OT	construction of new OT	construction of new building unit			room and OT		
e.	Emergency (Accident & other emergency) (Casualty)	Major and minor upgradation of building, waiting room and OPD	Major and minor upgradation of building, waiting room and OPD; construction of new OT	Major and minor upgradation of building, waiting room and OPD; construction of new OT	Minor upgradation of building, and OPD; major upgradation of waiting room; construction of new waiting room	Minor upgradation of building, waiting room and OPD; construction of new OT	Minor upgradation of building, OT and OPD; construction of new waiting room and OT	Construction of new waiting room and OPD	Major and minor upgradation of building
f.	Critical Care (ICU)	Construction of new building and waiting room	Minor upgradation of waiting room and OPD; construction of new building, waiting room and OPD	Construction of new building unit, construction of waiting room and OPD	Minor and major upgradation of building and OPD; construction of new waiting room	Major upgradation of building; construction of new waiting room, OT and OPD	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	No response	–

Infrastructural Gaps in Speciality Units									
#	**Specialty units**	**Arunachal Pradesh**	**Assam**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Sikkim**	**Tripura**
g.	Anaesthesia	Major and minor upgradation of building and waiting room	Minor upgradation of building, waiting room and OPD; construction of new waiting room	Minor and major upgradation of waiting room, building and OPD; construction of new building unit	Minor upgradation of building, waiting room and OPD; construction of new waiting room	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new waiting room	Minor upgradation of building, OT and OPD; construction of new waiting room and OT	No response	Major and minor upgradation of building
h.	Ophthalmology	Construction of new building, major and minor upgradation of waiting room, OPD and OT	Major and minor upgradation of building, waiting room and OPD; construction of new waiting room, OT and OPD	Minor and major upgradation of building, waiting room, OT and OPD; construction of new building unit	Minor upgradation of building; construction of new waiting room, OT and OPD	Minor upgradation of building and OPD; construction of new waiting room and OT	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	No response	Minor and major upgradation of building and OPD; construction of new waiting room and OT
i.	ENT	Construction of new building, major and minor upgradation of building and OPD	Minor upgradation of building and waiting room; major upgradation of building; construction of new waiting room, OT and OPD	Minor and major upgradation of building, waiting room, OT and OPD	Minor upgradation of building; construction of new waiting room, OT and OPD	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new waiting room and OT	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	No response	Major and minor upgradation of building and OPD; construction of new OT

Infrastructural Gaps in Speciality Units									
#	**Specialty units**	**Arunachal Pradesh**	**Assam**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Sikkim**	**Tripura**
j.	Dermatology and Venereology (Skin & VD) RTI / STI	Construction of new building, major and minor upgradation of OPD	Minor upgradation of building and OPD; major upgradation of building; construction of new waiting room	Minor and major upgradation of building, waiting room and OPD; construction of new building unit	Minor upgradation of building; construction of new waiting room and OPD	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new OT	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	No response	Major and minor upgradation of building; construction of new waiting room
k.	Orthopaedics	Construction of new building, major and minor upgradation of building and OPD	Minor upgradation of building; major upgradation of building; construction of new waiting room and OPD	Minor upgradation of building, waiting room, OT and OPD; construction of new building unit, new waiting room, OT and OPD	Minor upgradation of building; construction of new waiting room and OPD	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new waiting room and OT	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	No response	Major and minor upgradation of building and OPD; construction of new waiting room and OT

Infrastructural Gaps in Speciality Units									
#	**Specialty units**	**Arunachal Pradesh**	**Assam**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Sikkim**	**Tripura**
l.	Radiology	Construction of new building, major and minor upgradation of waiting room and OPD	Minor upgradation of building, waiting room and OPD; construction of new waiting room	Minor upgradation of building, waiting room, and OPD, major upgradation of waiting room; construction of new building unit, new waiting room and OPD	Minor upgradation of building, and OPD; major upgradation of waiting room; construction of new waiting room	Minor upgradation of waiting room and OPD; major upgradation of building; construction of new waiting room	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	No response	Major and minor upgradation of building and OPD; construction of new waiting room
m.	Dental Care	Construction of new building, major and minor upgradation of building, waiting room and OPD	Minor upgradation of building, and OPD; major upgradation of building; construction of new waiting room and OT	Minor upgradation of building, waiting room and OPD, major upgradation of waiting room	Minor upgradation of building, and OPD; major upgradation of waiting room and OT; construction of new waiting room and OT	Minor upgradation of waiting room and OPD; major upgradation of building	Minor upgradation of OT and OPD; construction of new building, waiting room and OT	Construction of new waiting room and OPD	Major and minor upgradation of building and OPD; construction of new waiting room
n.	Public Health Management	Absence of common bank account for all programs, vertical health societies merged with District Health Societies (DHS)			Absence of common bank account for all programs		Vertical health societies not merged with District Health Societies (DHS)	Absence of common bank account for all programs	

Requirement for upgradation in para clinical services

An analysis of gaps in para clinical services was also undertaken with specific focus on Pathological and Clinical Laboratory, X-Ray, Ultrasound, ECG, Blood Transfusion and Storage, Dental Technology (Dental Hygiene) and Drugs and Pharmacy.

The following table shows the gaps found in the District Hospitals with the para clinical services. The numbers in brackets indicate the number of sample DHs surveyed. All the DHs have functional pathological and clinical laboratory. Drugs and Pharmacy is also functional in all DHs except one in Tripura. Most hospitals lack the facility of Ultrasound and ECG.

Gaps in Para clinical Service (Unavailability of Services in Number of Hospitals among the chosen sample)									
#	**Para Clinical Services**	**Arunachal Pradesh (7)**	**Assam (9)**	**Manipur (6)**	**Meghalaya (3)**	**Mizoram (3)**	**Nagaland (3)**	**Sikkim (2)**	**Tripura (3)**
a.	Pathological & clinical Laboratory	0	0	0	0	0	0	0	0
b.	X-Ray	1	0	0	1	3	1	0	1
c.	Ultrasound	2	2	2	2	0	1	0	1
d.	ECG	6	0	5	6	1	1	2	3
e.	Blood Transfusion and Storage	0	1	2	0	0	1	1	0
f.	Dental Technology (Dental Hygiene)	3	3	0	3	0	0	1	0
g.	Drugs and Pharmacy	0	0	0	0	0	0	0	1

Requirement for upgradation in other services

The other services reviewed in DHs include ones that ideally should be available in a hospital, for instance Operation Theatre, Delivery Unit, Round the Clock Piped Water Supply, Ambulance Services, Registration Counter, Doctor's Duty Rom, Pharmacy, Parking Facility, Internet in Working Condition, Toilet and Staff Quarter. It was observed that ambulance service is available at all the DHs. Similarly, Registration Services is available at all except for 1 DH in Nagaland. Majority of the DHs do not have an Operation Theatre and Delivery Unit.

Gaps in Other Services (Unavailability of Services in Number of Hospital among the chosen sample)									
#	**Others**	**Arunachal Pradesh (7)**	**Assam (9)**	**Manipur (6)**	**Meghalaya (3)**	**Mizoram (3)**	**Nagaland (3)**	**Sikkim (2)**	**Tripura (3)**
a.	Operation theatre	4	2	4	4	0	1	1	1
b.	Delivery unit	4	0	0	4	0	1	0	0

Gaps in Other Services (Unavailability of Services in Number of Hospital among the chosen sample)									
#	Others	Arunachal Pradesh (7)	Assam (9)	Manipur (6)	Meghalaya (3)	Mizoram (3)	Nagaland (3)	Sikkim (2)	Tripura (3)
c.	Round the clock piped water supply	2	0	1	2	0	1	0	0
d.	Ambulance services	0	0	0	0	0	0	0	0
e.	Registration counter	0	0	0	0	0	1	0	0
f.	Doctor's duty room	1	0	0	1	1	1	0	0
g.	Pharmacy	0	0	0	0	0	1	0	1
h.	Parking facility	2	0	1	2	0	1	0	0
i.	Internet in working condition	3	0	1	3	1	2	0	1
j.	Toilet	0	0	0	0	0	1	0	0
k.	Staff quarter	0	0	0	0	0	2	0	0

Superspeciality hospital at Zonal and Regional level

The study recommends that in two strategic positions (zones) one in Dibrugarh and another in Silchar; two Super Specialty Hospitals equipped in the departments like mental health, cardio-vascular diseases, nephrology, endocrinology, neurosurgery, neuro medicine, cancer etc may be established. The concept of Super Specialty services at two Zones will provide alternative to Guwahati. The proposed two sites can be Silchar and Dibrugarh in Assam. Dibrugarh will cover Arunachal, part of Assam and Nagaland. The other proposed site in Silchar will cover people from lower Assam, and also from Meghalaya, Tripura, Mizoram and Manipur.

The North East Region can also think of a Regional Super Specialty Hospital like AIIMS in Guwahati. The proposed hospital cum medical college should have all 18 specialty services and 15 Super Specialty Services apart from other basic departmental facilities with intake of minimum 100 MBBS students and PG students.

Recommendations for District Hospitals to be promoted as ssecondary care hospitals.

Arunachal Pradesh: The state has 17 functional District Hospitals (DH). Among these 17 DHs, the state can develop four Model District Hospitals/Secondary care hospitals in Lohit, West Kameng, Upper Subansiri and Upper Siang.

Assam: The state has fully functional 27 District Hospitals (DH). Among these 27 DHs, the state can develop five Model District Hospitals/Secondary care hospitals in Dhemaji, Karimgunj, Dhubuei, Goalpara and Karbi Anglong. Another has been proposed either in Baksa or in Udalguri.

Manipur: The state has 16 District Hospitals (DH) out of which 7 DHs are fully functional. Among these 7 DHs, the state can develop two Model District Hospitals/ Secondary care hospitals, one in Churachandapur and the other in Ukhrul with provision of all facilities and HR as per IPHS norms.

Meghalaya: The state has existing 12 District Hospitals (DH) out of which 7 DHs were functional since 2011. Among these 12 DHs, the state can develop two Model District Hospitals/ Secondary care hospitals – William Nagar DH and Nongstoin DH, having all facilities and HR conforming to IPHS norms.

Mizoram: The state has existing 9 District Hospitals (DH) out of which 8 DHs are to some extent fully functional. Among these 9 DHs, the state can develop four Model District Hospitals/ Secondary care hospitals – at Lunglei, Champai, Mamit and Lumbli by 2030. By 2023, two models can be created one at Mamita and the other in Lunglei providing all facilities and HR as per IPHS norms.

Nagaland: The state has 11 District Hospitals (DH). Among the 11 DHs, the state can develop two Model District Hospitals/ Secondary care hospitals – Mokokchung and Kiphire DH with provision of all facilities and HR as per IPHS norms to cater to people of almost 7 districts.

Sikkim: The state has 4 District Hospitals (DH) all of which are functional. Among these 4 DHs, the state can develop one Model District Hospital/ Secondary care hospitals at West District which is an aspirational district (as per NITI AAYOG) ensuring all facilities and HR as per IPHS norms.

Tripura: The state has 8 District Hospitals (DH) out of which 6 DHs are fully functional. Among these 8 DHs, the state can develop three Model District Hospitals/ Secondary care hospitals. Kulai is an aspirational district and under the process of developing its DH as a Model DH. Other two DHs recommended are Gomati DH and North District Hospital. The Model DHs/ Secondary care hospitals will provide all facilities and HR as per IPHS norms.

The above recommendations are given based on certain criteria such as accessibility, population size, and backwardness of the area.

Availability of doctors, ANM, nurses and other staffs in the state

The survey has assessed 23 positions including specialty doctors and other medical staffs. The unique position categories included in the survey are Medical and Health Officer (MBBS), Surgeon or General Surgery, Physician or General Medicine, Gynaecologist, Anesthetists, Pediatrician, Ophthalmologist or Eye Specialist, Orthopedic Surgeon, Psychiatrist, ENT Specialist, Dermatologist, Pathologist, Microbiologist, Radiologist, Cardiology (Spl/Sr Spl), Oncologist, Dental Surgeon, Pharmacist, Staff nurse, ANM/MPW, LHV, Laboratory Technician, X-Ray Technician/ Radiographer. Most of the shortage is found in case of Medical and Health Officer, Staff Nurse, ANM/MPW, LHV and Laboratory Technician. The least gap in terms of human resource is seen in case of Sikkim.

Gaps in Human Resources (Unavailability of Services in Number of Hospital among the chosen sample)									
#	**Category of Human Resources**	**Arunachal Pradesh (7)**	**Assam (9)**	**Manipur (6)**	**Meghalaya (3)**	**Mizoram (3)**	**Nagaland (3)**	**Sikkim (2)**	**Tripura (3)**
i	Medical and Health Officer (MBBS)	200	823	Nil	281	304	313	38	492
ii	Surgeon or General Surgery	34	83	19	26	22	16	5	34
iii	Physician or General Medicine	0	0	0	1	Nil	-	0	14
iv	Gynaecologist	67	40	35	40	67	20	4	57
v	Anaesthetist	39	86	19	15	63	10	2	37
vi	Paediatrician	36	8	14	17	37	13	0	26
vii	Ophthalmologist or Eye Specialist	55	97	23	31	21	30	2	22
viii	Orthopaedic Surgeon	14	32	6	6	Nil	4	0	8
ix	Psychiatrist.	18	12	6	5	14	9	0	7
x	E.N.T. Specialist	11	Nil	7	8	10	1	0	3
xi	Dermatologist	18	39	5	11	10	10	0	16
xii	Pathologist	36	56	14	19	38	13	0	8
xiii	Microbiologist	17	38	7	11	10	10	0	3
xiv	Radiologist	9	14	Nil	9	15	8	0	11
xv	Cardiology(Spl/Sr.Spl)	0	Nil	0	0	Nil	0	0	0
xvi	Oncology (Spl/Sr.Spl)	0	Nil	0	-	Nil	0	0	0
xvii	Dental Surgeon	0	Nil	Nil	-	5	-	0	0
xviii	Pharmacist	274	Nil	Nil	62	253	64	50	0
xix	Staff Nurse	1802	1726	442	675	1600	467	120	0
xx	A.N.M./MPW(M&F)	750	552	191	-	1630	-	99	1102
xxi	LHV	1865	2171	165	1330	111	1522	472	251
xxii	Laboratory Technician	138	258	183	194	357	95	49	114
xxiii	X-Ray Technician/Radiographer	130	243	36	54	72	35	3	2

Requirement for infrastructural upgradation in Super-specialty units

In case of Super-specialty hospitals, gaps have been analyzed for 18 specialty departments and 15 super specialty departments which are required for an AIIMS like institution. Super specialty units have been reviewed in 5 hospitals in Arunachal Pradesh, Assam, Manipur, Mizoram and Sikkim with one hospital in each state. It is observed that all the super specialty units are functional in Assam Medical College, Dibrugarh and JNIMS, Manipur. In case of Niba Hospital, Arunachal Pradesh only the Pulmonary Medicine and Critical Care is functional.

Functionality of Super Specialty Units								
Super-Specialty Departments	**Arunachal Pradesh**	**Assam**	**Manipur**	**Meghalaya**	**Mizoram**	**Nagaland**	**Sikkim**	**Tripura**
	Niba Hospital, Naharlagun	**Assam Medical College, Dibrugarh**	**JNIMS**	**NA**	**Falkawn Govt. Hospital**	**NA**	**SMU**	**NA**
i) Cardiology	N	Y	Y	N	Y	N	Y	N
ii) Cardio-thoracic & Vascular Surgery	N	Y	Y	N	N	N	N	N
iii) Gastroenterology	N	Y	Y	N	N	N	Y	N
iv) Surgical Gastroenterology	N	Y	Y	N	N	N	N	N
v) Nephrology (with dialysis)	N	Y	Y	N	N	N	N	N
vi) Urology (and Renal Transplantation)	N	Y	Y	N	N	N	N	N
vii) Neurology	N	Y	Y	N	N	N	N	N
viii) Neurosurgery	N	Y	Y	N	N	N	N	N
ix) Medical Oncology/Haematology	N	Y	Y	N	N	N	Y	N
x) Surgical Oncology	N	Y	Y	N	N	N	N	N
xi) Endocrinology & Metabolic Diseases	N	Y	Y	N	N	N	N	N
xii) Nuclear Medicine	N	Y	Y	N	N	N	N	N
xiii) Paediatric Surgery	N	Y	Y	N	N	N	N	N
xiv) Burns & Plastic Surgery	N	Y	Y	N	Y	N	Y	N
xv) Pulmonary Medicine & Critical Care	Y	Y	Y	N	Y	N	N	N

Recommendations for super care or tertiary care hospital

From the existing medical colleges in each state, some of the medical colleges, which can be called as super care or tertiary care hospital, are recommended below.

- Arunachal – TRIHMS
- Assam – Guwahati Medical College at Regional level
- Sikkim – STNM
- Tripura – Agartala Medical College
- Mizoram – MIMER
- Manipur – JNIMS
- For Nagaland – Kohima Medical College

For the north eastern states where there was no possibility of having tertiary care hospitals, the central medical institutes located in the region has been recommended as institutes which can be developed as Tertiary Care Hospital. For Meghalaya state, NEIGRIHMS is recommended to be developed as a tertiary care hospital.

Financial Estimation

The overall budget has been suggested on the basis of the strategic plan for infrastructure and health facilities by 2030. The building blocks of the plan are new health facilities, upgradation of health services in existing facilities, strengthening of existing HR rules and systems and affordable and quality services at secondary and tertiary units. Interventions and budget under these blocks have been estimated to arrive at an overall budget.

Building Blocks of the Budget		
a.	New health service facility units	• One Model district hospital at geographically advantageous location with all necessary services and complete staff strength • CHC, FRU and District Hospitals in every district • Medical college in every State for creating doctors as required by 2030 • Nursing, Paramedical institute, Pharmaceutical college in every state for creating nurses, paramedical staffs as required by 2030
b.	Upgradation of health service in existing facility units	• Upgradation of existing secondary, tertiary health care facilities with reference to IPH norms
c.	Strengthening existing HR	• Training of existing Medical officers on specialist wings in order to bridge the gap between availability and requirement • Training of doctors, RKS on administration and accounts • Strengthening HR policy
d.	Affordable, accessible quality service at secondary and tertiary units	• PPP mode in diagnostic service, setting nursing college, other non-medical services at State hospitals, DHs, SDH and CHC to ensure quality service • NGO involvement in managing public health program

An estimated budget for the next 5 years has been made as a reference point for the financial planning. Unit costs are calculated either on the basis of reference documents, existing guidelines or in consultation with experts oriented with similar matters or on the basis of field experiences.

The state Governments need to mobilize investments from both private and public sectors and international donors. Government schemes and budget under national and state government programs will part finance the plan. Promoting private sectors, encouraging them with PPP models, land bank, tax incentives will attract them to invest in healthcare infrastructure in NE states. Some of the sources of finance from the government schemes could be from convergence with National Health Mission, NRHM and NUHM, Mukhya Mantri Jeevan Raksha Kosh, Ayushman Bharat, Mukhya Mantri Sishu Suraksha Avum Sutkeri Sahayog Yojana, Mukhya Mantri Shrawan Shakti Yojana, North East Council and Family Welfare, the state Government and the central Government. Apart from the public sector, funds can also be mobilized from international aid agencies like WHO, World Bank, EU, ADB, etc. PE funds, commercial external borrowings, foreign investment etc. Partnering with private hospitals in a PPP mode would also be instrumental in fund mobilization. Funds can also be generated from institutions such as the Northeast Voluntary Health Association and the National Health Resource Center.

The broad purpose for which funds would be used is indicated in the following table. Some of the specific areas of intervention would include establishment of new wings, major and minor upgradation of departments, new constructions etc.

Budget Estimates of the Facilities

Purpose/ State	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Grand Total (INR Lakh)	**38027**	**901906**	**97466**	**82817**	**58870**	**46503**	**51308**	**72703**
A. Establishing New Facilities	20975	926626	77753	66575	39905	31425	46825	55571
B. Up-gradation of Facilities	12294	60472	14091	7264	13819	6884	2502	11510
C. Training	158	338	158	138	126	134	61	158
D. Setting up Training centre	350	-	350	350	350	-	350	350
E. Equipment procurement	2000	5000	2000	5000	2000	3000	200	2000
F. Public Private Partnership	1750	8470	2470	1990	2170	3685	870	2470
G. NGO involvement for community health programs	500	1000	644	1500	500	1375	500	644

Limitations

The recommendations provided in this report have been made based on the opinions expressed by the respondents. While care has been taken to check the information provided physically, there are many inputs especially pertaining to strategy which are purely qualitative in nature and are therefore prone to personal biases, preferences and prejudices. Further, data could not be obtained from all the department of the multi-specialty hospitals due to limited time of the assignment and unavailability of concerned medical superintendents.

Sutra Consulting

N2/139, IRC Village, Nayapalli
Bhubaneswar, Odisha - 751015
sutra@sutraconsulting.com
Phone: +91 (0) 674 - 2555310