BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF MEDICAL EQUIPMENT
FOR
KANTI CHILDREN'S HOSPITAL
IN
THE KINGDOM OF NEPAL

December 1984

JAPAN INTERNATIOHAL COOPERATION AGENCY

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PREFACE

In response to the request of His Majesty's Government of Nepal, the Government of Japan decided to conduct a study on the Basic Design on the Project for Improvement of Medical Equipment for Kanti Children's Hospital and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Nepal a study team headed by Dr. Yoshio Hirota, Deputy Director, Planning Division, Water Supply and Environmental Sanitation Department, Environmental Health Bureau, Ministry of Health and Welfare from September 12th to 22nd, 1984.

The team had discussions with the officials concerned of His Majesty's Government of Nepal and conducted a field survey in Kathmandu and Pokhara areas.

After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

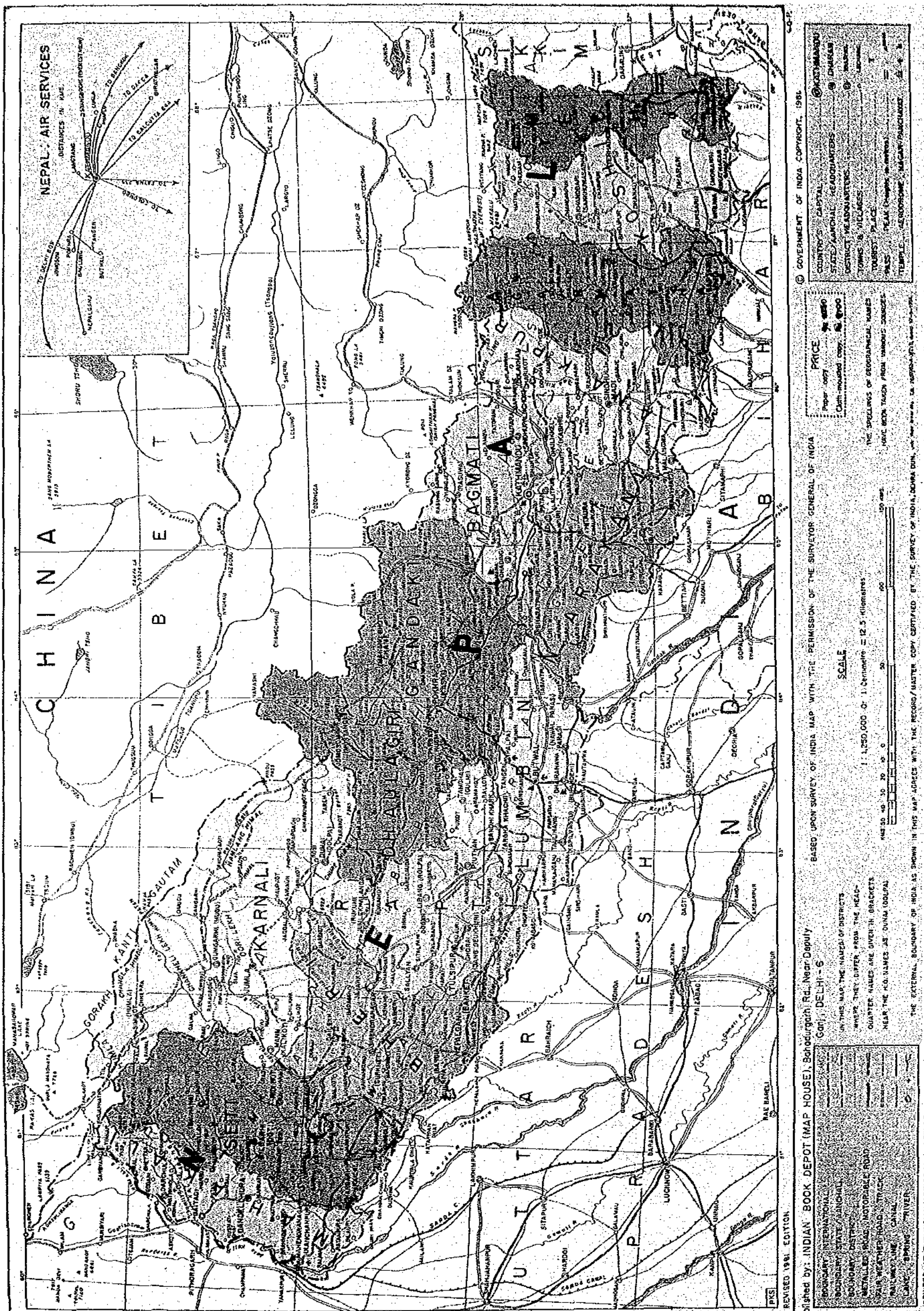
I wish to express my deep appreciation to the officials concerned of His Majesty's Government of Nepal for their close cooperation extended to the team.

December, 1984

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency

NEPAL



NEPAL: AIR SERVICES
DISTANCES IN KMS.
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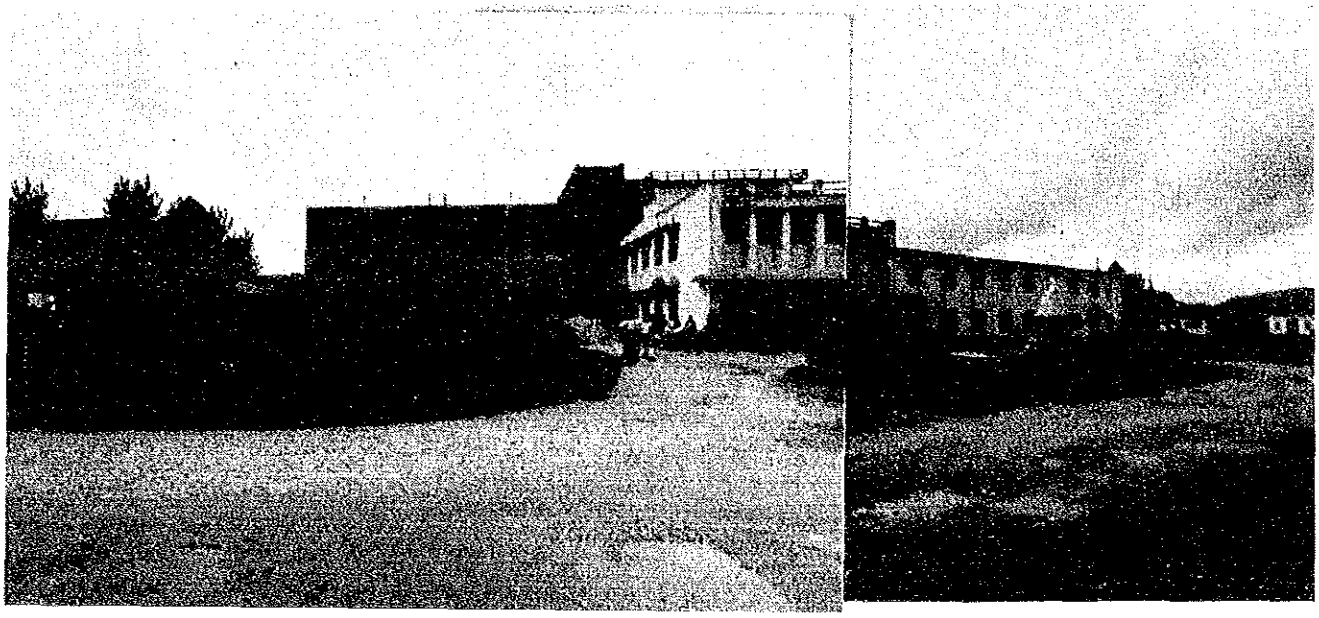
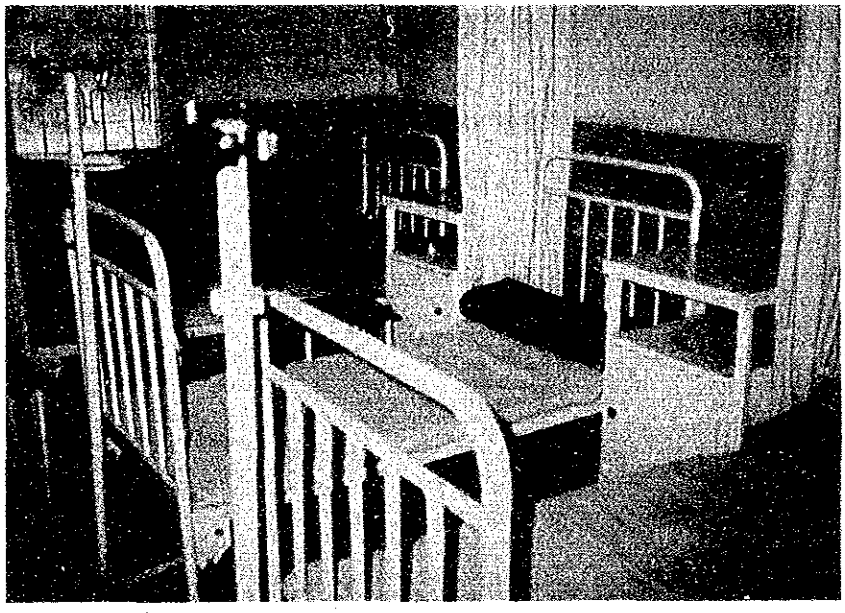
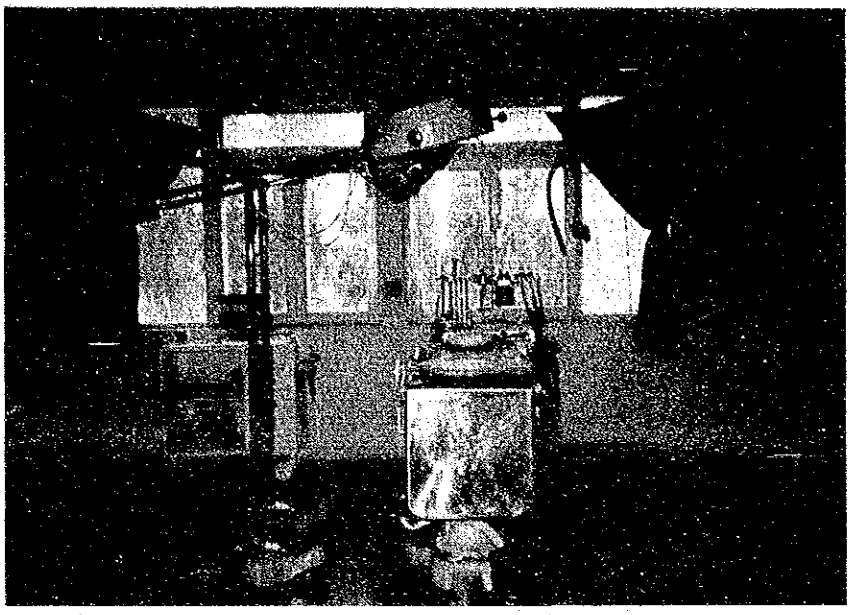


Front View of Kanti Children's Hospital

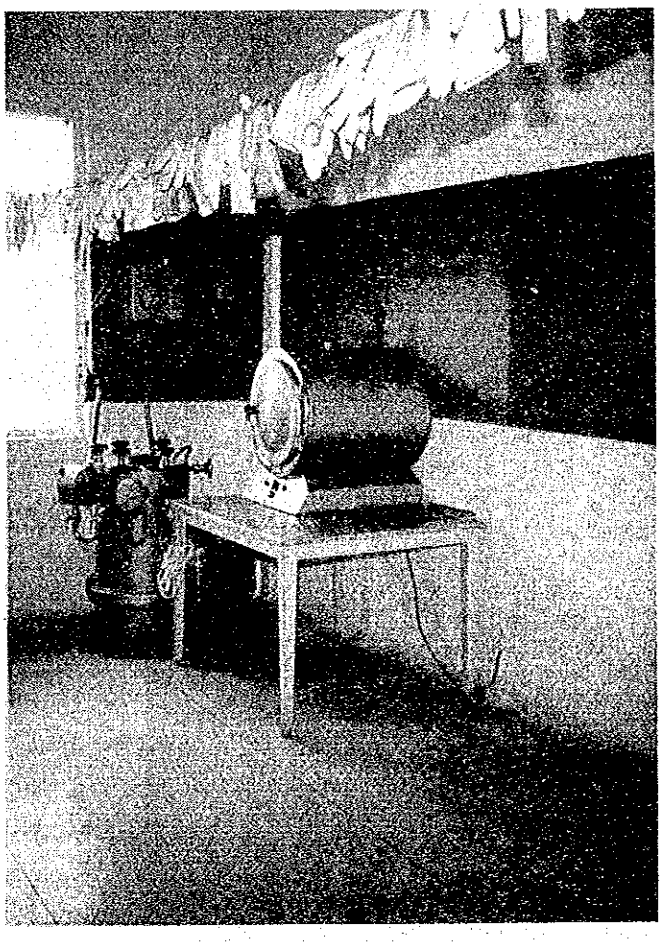
Outpatient Department (Surgery)



Rehydration Therapy Unit

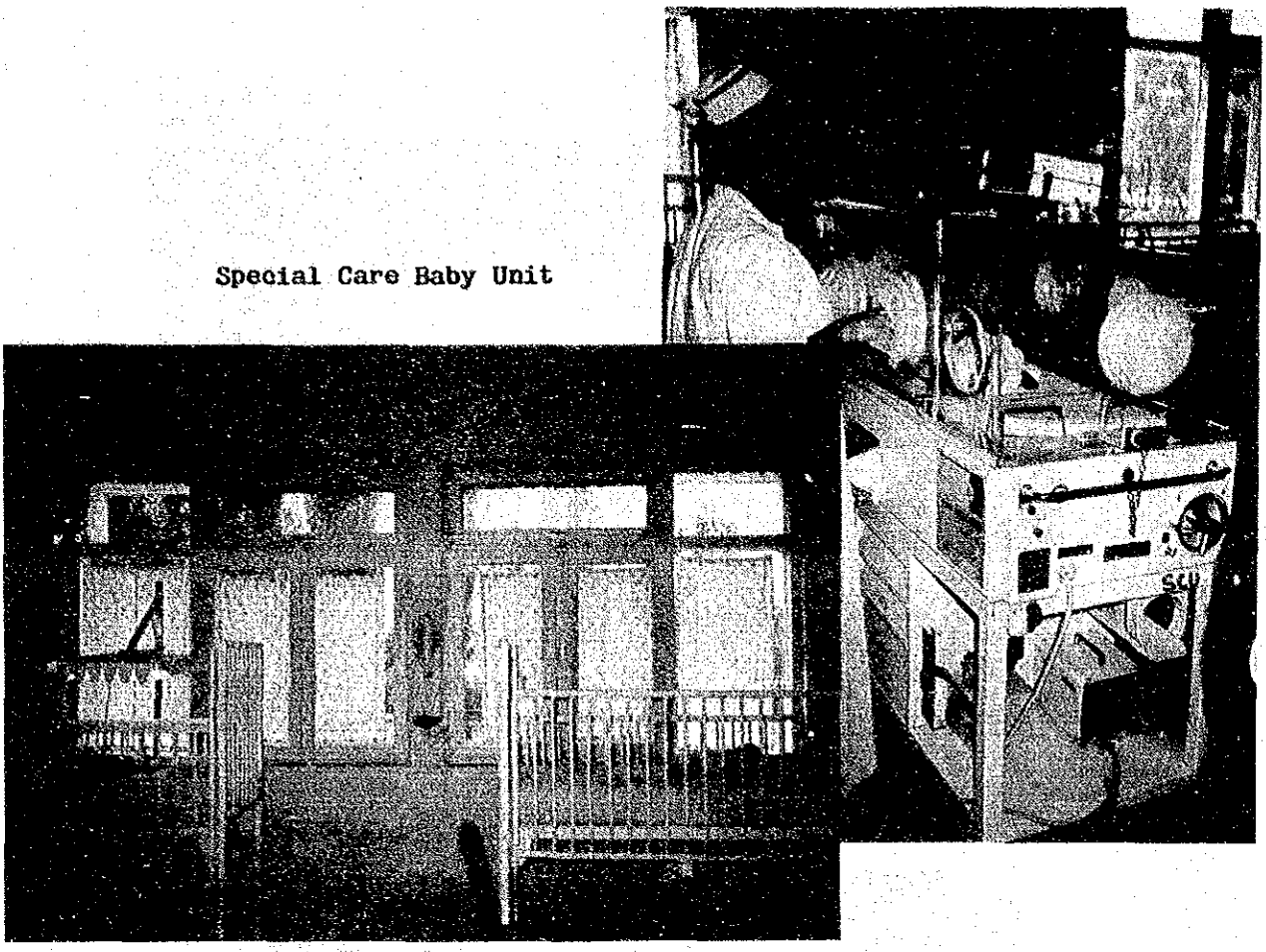


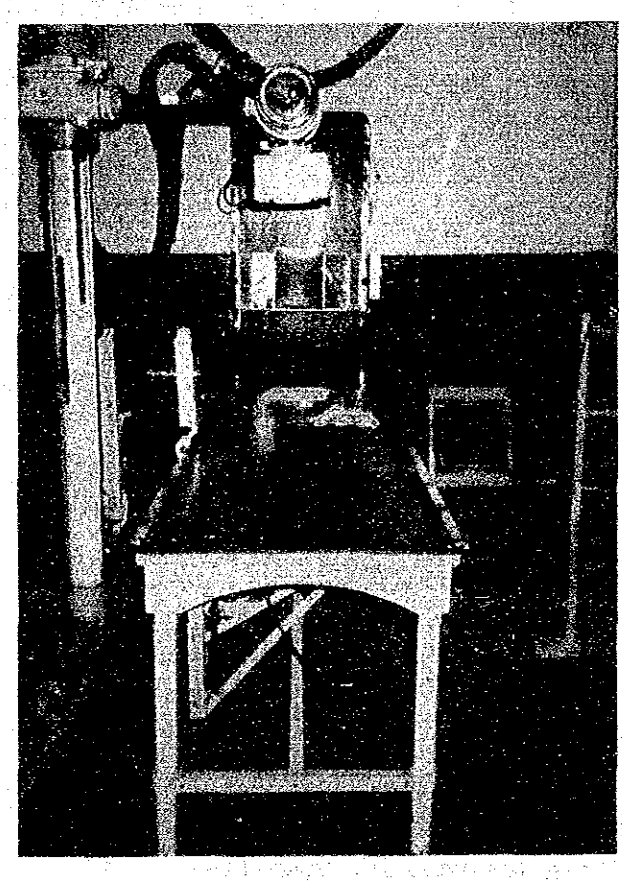
Operation Theater



Sterilization Room for Operation

Special Care Baby Unit





X-ray Room

SUMMARY

The Kingdom of Nepal is an inland country that is characterized by hills and mountains covering 83% of its land, and has boundaries with India to the east, west and south, and with China to the north. Nepal therefore has the disadvantage that its trade routes are subject to influence from those two large countries. To lessen the dependence on these neighbours and in pursuit of further self-support, Nepal is currently making use of various sources of foreign aid including United Nations agencies and the governments of developed countries, in order to carry out its sixth Five-Year Plan, to be succeeded by the seventh Five-Year Plan in 1985.

Its primary objective is the enlargement of production capability to meet the basic needs of the people.

Under this plan, the Ministry of Health of the Kingdom of Nepal in 1965 established the Long-Term Health Plan, which will come to an end in 1990.

This plan aims at raising the standard of living, improving the economy and reducing mortality by reduction of the incidence of disease through more widespread medical services. At the same time, for the purpose of improving these medical services, it is intended:

(1) To develop the basic health facilities by providing preventive and general medical services to serve at least ninety six percent of the rural people,
(2) To control the undesired population growth in order to support overall national development,
(3) To establish at least one 15-bed hospital in each of the 75 districts in order to provide medical services to the people,
(4) To train the technical health manpower with the country's own resources and to properly utilize the existing manpower more effectively by providing additional incentives,
(5) To bring about structural changes in order to make effective health services, and
(6) To lay emphasis on education and dissemination of information about environmental health, nutrition, and hygiene and other relevant conception.

The administrative control bodies charged with carrying out these changes are the Ministry of Health, the Department of Health Services, the Regional Directorate (anticipated to take over the roles of Department of Health in the near future), and the District of Health Office; while the medical and health care facility system is organized in descending order of size and extent of facilities as: hospitals, health centers, health posts. To complement this system, 76 general hospitals, including special hospitals, whose total bed number amounts to 3,048 as of 1984, are scattered nationwide. The percentages of the original Long-Term Health Plan so far successfully carried out are 65% to 75% in numbers of facilities, 45% to 60% in manpower; 100% attainment is expected to be difficult to achieve.

The current status under this medical and health care environment is statistically presented below:

Life expectancy	47 years for males
	44 years for females
Mortality	19/1,000
Infant Mortality	150/1,000

The younger generation, aged below 15, accounts for 42% of the total population, thus impeding the production capability of the Kingdom of Nepal. The only institute in the nation that currently exists to produce the medical manpower to cope with this situation is the Institute of Medicine, Tribhuvan University, which also serves as a medical service center for all fields excluding pediatrics. For pediatric medical services, Kanti Children's Hospital is the sole specialized pediatric facility and reference center, but it is under-equipped not only as a specialized teaching institute but also as a leading hospital in the pediatric field in the Kingdom of Nepal.

Kanti Children's Hospital is under the administration of the Ministry of Health, having departments including Internal Medicine, Surgery, Dentistry, Radiography, Clinical Pathology, Pharmacy, Emergency, etc., as well as a Rehydration Therapy Unit to cope with diseases unique to children. The nominal number of beds is 88, but there are currently 120 beds in actual use, of which 27 are paying beds.

This capacity will be increased to 250 beds and 50 extra paying beds will be moved into a separate ward. The staff number is 54 altogether, while doctors from the Institute of Medicine of Tribhuvan University always participate in medical activities.

The joint policy of the Ministry of Education and Culture and the Ministry of Health lays down that the pediatric course shall be taken at Kanti Children's Hospital. In order to improve the general usage of the medical facility, to consolidate the manpower in primary health care, thereby elevating the quality of medicine in Nepal, a request has been made to improve the medical equipment in this hospital.

In response to this request, a Basic Design Study Team was sent to the Kindgom of Nepal. The results of the field survey and home office work led to the judgement that the existing medical equipment of Kanti Children's Hospital could be made use of by further equipping the twelve departments including the Special Care Baby Unit to meet the goal of good modern pediatric medical care, which should at the same time serve to produce the medical manpower with advanced modern professional skills, thus accelerating the nationwide spread of primary health care activities with the final aim of lowering the infant mortality. The twelve departments to be improved are:

1. Special Care Baby Unit
2. Milk Kitchen
3. Intensive Care Unit
4. Emergency Clinical Test Room
5. Radiographic Unit
6. Neonatal Surgical Department
7. Operating Theater
8. Sterilization Room
9. Clinical Pathology Department
10. Casualty Department
11. Ward, and
12. Service Facility

In selecting the equipment, current conditions as well as future plans were taken into consideration, and also the adaptability to Nepal in terms of operation and maintenance. In spite of this, modern infant care necessitates increased operating and administrative costs owing to new medical technologies and high treatment cost per patient. Therefore, Nepal must set aside a sufficient budget for the medical manpower and for operational expenditure in carrying out the plan.

The estimated lead time for the delivery and installation of the equipment is approximately eight months after the signing of the supply contract, and the total cost on the Nepal side will be approximately 1,540,000 rupees. And the total cost to be required in the stage of the re-equipment will be approximately 3,880,000 rupees for maintenance and running the hospital.

The equipment will bring about a long-desired improvement in the quality of medical services in the pediatric care, adding to the momentum of medical education and increasing the number of medical professionals. These changes will make in decreased infant mortality. It is estimated also that further benefits will accrue if the post-installation instruction on the equipment is given in the form of technical cooperation.

CONTENTS

CHAPTER 1: INTRODUCTION

CHAPTER 1: INTRODUCTION

The Kingdom of Nepal, during the course of seven consecutive Five-Year National Economic Development Plans (1955 to 1990), accompanied by a Long-Term Health Plan (1965 to 1990) set up by the Ministry of Health, has been putting efforts into the propagation of health and hygiene and has laid down provisions for primary health services including medical professional education. The target is suppression of population growth (2.65%) and decrease of the mortality rate (19 per 1,000) based upon nationwide medical care and the prevention of disease. Deaths caused by diseases in descending order of mortality rate are:

1. Infectious diseases affecting the digestive organs, including diarrhea,
2. Respiratory diseases, and
3. Puerperalism by infection.

Prevention of infection as well as decrease in neonatal mortality (150 per 1,000) are key factors in achieving the above goals.

Kanti Children's Hospital is the only specialized pediatric hospital in the Kingdom of Nepal, and carries out not only diagnosis and therapy but also education and field training of medical manpower. Notwithstanding the demand for its active role in various fields of medical services, its activities have been seriously restricted by the inadequacy of its equipment and facilities. Hence the Kingdom of Nepal has clearly recognized the urgent need both to strengthen and develop various activities of Kanti Children's Hospital as a referral hospital so that the people of Nepal may place their reliance on it as a medical institution, and to develop human resources. For this reason, the Kingdom of Nepal has requested the cooperation from Japan. In response to this, the Government of Japan sent a Basic Design Study Team headed by Dr. Yoshio Hirota, Deputy-Director, Planning Div., Water Supply and Environmental Sanitation Dept., Environmental Health Bureau, Ministry of Health and Welfare, through the Japan International Cooperation Agency,

from September 12 to 22, 1984. The study team had discussed and surveyed the proposed details, purposes and plans; the present status and future plans for health care activities; and the relevant medical facilities. The Team also confirmed the willingness of the implementation body to cooperate in the Project.

Based upon the results of the study and home office work in Japan, the feasibility of the Project was assessed, and its content, scale, lead time and necessary cost were estimated. The details of these items are contained in this Basic Design Study Report.

CHAPTER 2: BACKGROUND OF THE PROJECT

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2-1 SOCIAL AND ECONOMIC STATUS IN GENERAL

The Kingdom of Nepal is an oblong inland country having boundaries with India to the south, west and east and with China to the north. Highland areas -- the northern mountain region (5,000 meters above sea level), Tarai (approximately 3,000 meters) in the south, and, in the center, the hilly region (600 to 5,000 meters) including Kathmandu Valley (1,300 meters) -- occupy 83% of the country. The climate is in general an inland one, with a rainy season in June to September, and a dry season in winter.

Around 350,000 out of the total population (1984) of 1.6 million live in the capital, Kathmandu; and 41.35% of this population is under 14 years old. Politically, Nepal is a constitutional monarchy based on the Panchayat system, and is thus sometimes referred to as the Panchayat Democracy. Panchayat, which originates in India, means "Assembly of Five" or "Council of Five". It forms the social system of the villages, districts, zones and regions.

Hinduism, the national religion, is professed by 89% of the population, the other religions being Buddhism (7.5%), Islam (3%) and Christianity. The constitution of the Kingdom of Nepal specifies Hinduism as the national religion and prohibits any forced conversion of one individual by another to another religion, but admits complete freedom of religion to each individual. Many believe in native gods besides Hinduism.

The official language in this multilingual nation is Nepalese, but since Nepal is at the meeting-point of the Indian-Aryan language group (in the Tarei area) and the Mongol Tibetan-Burman group (mainly in the central mountain area), more than 40 languages exist.

Racially, Nepalis are Thakli of Aryan blood; Chetri and Braman of Indian; Magar, Gurung, Tamang, Rai, Limbu and Sherpa of Mongoloid.

School attendance percentages to primary (six to eight years old), lower secondary (nine to ten) and higher secondary schools were 77%, 32% and 4% in 1978/1979, respectively. In the sixth Five-Year Plan it was projected that 85 to 90% of pupils were given the opportunity of an education without any economic load to their parents, and for this purpose efforts were made to eliminate the shortage of teachers.

Historically and geographically, 70% of import and export trade is with India; but other trading countries include Japan, USSR, China, USA and Republic of Korea, and to those countries jute, rice, leather, handicraft goods and carpets are exported. USA, GDR, Belgium, Singapore and Japan export to Nepal with constant trade deficits on the side of Nepal.

The fifth National Economic Development Plan ended in June 1980, and now Nepal is carrying out its sixth plan. For these plans, His Majesty's Government of Nepal budgeted 2,308 million rupees for 1979/1980 and 6,086.2 million for 1983/1984, amounting to 66.52% and 77.77% of the total national budget. The total budget for the sixth Five-Year Plan amounts to 3,520 million rupees, of which 64% is anticipated from foreign aid.

The inflation rate was 254.0 in 1982/1983, taking 1972/1973 as 100, so that the mean increase per annum is 12%.

90% of the population is engaged in agriculture, producing 2,550.6 million dollars GNP ($166 per head), and the GDP, which is strongly influenced by the weather, since agricultural production accounts for 60 to 70% of the country's total production figures, was 1,988.9 million dollars ($145 per head). In the sixth Five-Year Plan, the target of GDP increase rate is 4.3% per annum on average.

In accordance with a 1965 agreement signed with Japan, various projects of economic cooperation have been implemented upon the request of His Majesty's Government of Nepal.

The Kingdom of Nepal can be characterized in short as a country that tries, in spite of strong influence from China and India, to develop its own economy and society with the help of foreign aid in order to maintain its self-support.

2-2 NATIONAL ECONOMIC DEVELOPMENT PLAN

2-2-1 Sixth Five-Year Plan

The Kingdom of Nepal initiated the first economic development plan, with a duration of five years, in fiscal 1955, and has renewed its efforts at development every five years since. The Sixth Five-Year Plan has been in force since 1980, and will be succeeded by the Seventh Five-Year Plan in 1985. The basic principles of the Sixth Five-Year Plan are:

I. To increase production at a faster rate to dissolve the problems which are the widespread poverty, unemployment and under-employment,

II. To increase productive employment opportunities by the effective utilization of unutilized and huge manpower resources scattered throughout the nation in an effective manner, and

III. To meet the basic minimum needs of the people which are being foodgrains, domestic fuel, supply of drinking water, expansion of health care and sanitation, expansion of primary, craft-oriented and adult education, and augmentation of basic transportation facilities.

The detailed strategies for fulfilling the above aims are:

(1) To give the highest priority to the agricultural sector,

(2) To develop cottage and other small industries,

(3) To promote export trade,

(4) To optimize the use of installed facilities,

(5) To strengthen the economy to generate more resources, taking into account the following:

  (a) Diversification of investment activities (promotion of investments in private enterprise and at the local panchayat level),

  (b) Development of an organization to reform the land tenure and tenancy systems,

  (c) Strengthening of development policy (cooperation and adjustment between Ministries, and improvements in levy collection),

(6) Training and expansion of the labour force,

(7) Increase of construction material supply, and

(8) Systematic implementation of family planning activities to control undesirable rate of population growth.

The allocation of the financial resources for the Sixth Five-Year Plan is as follows:

i.	Agriculture and Forest	33.2%
ii.	Industry and Power	24.6%
iii.	Transportation & Communication	21.4%
iv.	Social Services	20.8%

The average economic growth rate of the Sixth Five-year Plan has been planned by 3.2% and 5.6% in the sectors of agriculture and non agriculture respectively, but the actual ratio is supposed to approximate to 2%.

Development objectives are so focussed on the basic needs of the people that the two targets i.e., increased production of basic foodgrains and primary health services are attended. The latter target is set specially on the maternity and child health program with the national implementation in the improvement of the installed hospitals and the local panchayat sector.

2-2-2 Seventh Five-Year Plan and Long-Term Health Plan

The objectives of the Seventh Five-Year Plan (1985-1990) are viewed against the background of the following challenges:

(a) To narrow down the gulf between planning and implementation, and to step forward to carry out what has been laid down and translate the vision into reality,

(b) To focus the entire attention and endeavour of the nation on the tasks of increasing production and employment opportunities, and fulfilling the minimum basic needs of the common man as laid down so clearly in the Sixth plan,

(c) To build up the productive capabilities of the economy on the basis of the development of land and water resources, which form the physical endowments of the nation,

(d) To devote proper attention to conserving and expanding the natural wealth, and

(e) To take steps to tackle the population problem.

They are framed as to help implementation of the basic strategies of the Sixth Five-Year Plan and to aim at achieving the planned goals. That is to say, the upgrading of the productiveness magnified through the Sixth Five-Year Plan meeting the minimum needs of the people is aimed. Population control and family planning including the child health services have been put stress in the health sector.

With these Five-Year term plans, the Ministry of Health has executed the Long-Term Health Plan commenced in 1965 with 25 years period of time to acomplish. The policies set forth to strengthen the nation by raising the standard of living to reduce the morbidity and death rates are:

(1) To develop the basic health facilities by providing the preventive and general medical service in light of ninety six percent of the rural people,
(2) To control the undesired population growth in order to support the overall national development,
(3) To establish at least one 15-bed hospital in each of 75 districts in order to provide medical services to the people,
(4) To integrate all the present vertical projects into the basic health service,
(5) To study the effectiveness of the Ayurvedic medicine, raise the supply level of these medicines and provide preventive and family planning service also by the Ayurvedic organization,
(6) To train the technical health manpower with the country's own resources and to properly utilize the existing manpower more effectively by providing them additional incentive,
(7) To bring structural changes in order to make effective health services,
(8) To coordinate and control existing private and mission hospitals and run them by the Government itself by the end of 1990,
(9) To seek the people's cooperation in health service,

(10) To lay emphasis on extension and broadcasting about environmental health, nutrition, education,

(11) To bring self reliance in medicine gradually by raising production level, and

(12) To start the system of fee gradually over the existing free medical service.

The priority is on the items (1), (2) (4), (6) (10), (11).

(4) refers to the eradication project for malaria, small pox, tuberculosis control and laprosy control.

2-2-3 Foreign Aid Activities

International aid to Nepal began early in 1951 when India and the USA initiated grants to support the institution of a constitutional monarchy under King Tribhuvan. This example was followed by China (1956), USSR (1959) and England (1960). Many countries now provide aid to this country, sandwiched as it is between two great powers, India and China. Nepalese foreign policy has been to avoid excessive dependence on any one country and to make a balance of power between the various sources of foreign aid. In order to avoid the further development of disorderly foreign aid competition, a meeting was held in Tokyo on December 2, 1976, to control foreign aid to Nepal. This meeting was organized by the World Bank in the interests of greater effectiveness in economic cooperation at the request of His Majesty's Government of Nepal and was timed to meet the requirements of the fifth Five-Year Plan.

At the third meeting, the Nepalese situation was discussed with regard to inefficiency and stagnant economic conditions. In particular, the World Bank pointed out strongly that Nepal might stay within the vicious cycle of poverty, and should therefore make greater efforts towards the development of its national resources. On the other hand, proposals were made to the countries providing the aid in connection with the following possible actions: (1) Granting of products satisfying basic human needs, (2) enlargement of local cost financing, and (3) technical cooperation for the development of human resources.

The Nepalese Ministry of Finance publishes economic statistics on the foreign aid that it receives. These indicate that a rapid increase occurred in 1975/1976 and in 1978/1979 -- 1,415.7 million rupees and 2,417.3 million rupees, respectively, in terms of committments given. On the basis of actual aid received, the totals were 556 million rupees in 1975/1976 and 989.4 million rupees in 1978/1979. The rate of increase has recently accelerated. Although only estimates are available, the figures for 1979/1980 amounted to 1,897.2 million rupees (committed) and 1,876.2 million rupees (actual).
The announcements of the Nepalese Ministry of Finance do not take into account technical aid, which is estimated by the World Bank to be about 40% of the total including food and other products. (Estimate for 1977/1978: total, 111.6 million dollars, actual; technical aid, 42.8 million dollars)

Japanese aid is mostly of government origin, very little being from the private sector, as in the case of overseas investments. General grant aid has been provided amounting to 7 billion yen (on the basis of E/N figures), as of December 1980. For the cooperation in the health sector, 30 million yen was grantd to Tribhuvan University for educational and research equipment. It is now planned to build a Nursing School in the premises of the University.

Other countries providing foreign aid to the Kingdom of Nepal are: India (61% is spent on infrastructure such as roads and airports), the USA (project to eradicate malaria, family planning project, medical personnel training scheme), Britain (project to eliminate malaria, dispatching of volunteers), and China (mainly for road construction and industrial development).

The Kingdom of Nepal depends on foreign countries for large-scale aid and on voluntary donations from private organizations for minor aid for consumables and the like. In the medical health care field, India, the USA and Canada are helping Nepal on a private volunteer basis. Reference should be made to the following table showing each country's aid contributions in the health sector (excluding Japan's).

Table 2-1

LIST OF PRINCIPAL FOREIGN GOVERNMENTAL AID SOURCES (IN THE HEALTH SECTOR)

(Unit: US$1,000)

Country	Project	Year	Amount Aided
U.S.A.	Improvement of Public Health Management System and Promotion of Rural Public Health and Family Planning	1980-1885	16,200
	Aids to Foundation of Private Volunteer Agency in Charge of Public Health Project	1981-1988	1,250
	Improvement of Public Health System	1980-1985	18,000
	Development Project of Family Planning	1979-1984	2,000
	Financial Aid to Construction of Tribhuvan Pharmaceutical Institute	1976-1982	1,605
India	Throncus Golter Endemic Goiter Control Project	1977-1978	359
	Construction of OPD Unit of Bir Hospital	1984-	
U.K.	Dalan Training Center for Education and Medicining		1,470
	Malaria Control Plan		950
U.N.D.P.	Royal Drugs Research Laboratory Domestic Materials Quality Study	1982-1984	1,514
	Primary Health Support Service	1980-1985	1,702

2-3 CURRENT CONDITIONS OF HEALTH AND MEDICAL SERVICES

2-3-1 General Conditions

Whether the Five-Year National Economic Development Plan and the Long-Term Health Plan is attained or not depends upon the efficient utilization of national resources and effective achievement of planned targets. For this, acceleration of regional development through the Panchayat system, and nationwide systemization through the organization of the regional units and the creation of leaders in those units. However, owing to the geographical obstacles to efficient transportation in this nation of mountains, it is deemed of the utmost importance that the concept of health care and hygiene be communicated and advocated among the people so as to eradicate infectious diseases, relieving Nepal of its dependence on other countries for the education of its doctors, and at the same time to improve the technical facilities and the personnel qualifications of the medical services in both quantity and quality. Medical statistics show the birth rate to be 42/1,000, the death rate to be 19/1,000, the mortality of the newborn to be as high as 150/1,000, and life expectancy is as low as 45.5 years (47.5 for males and 44.5 for females). The reasons behind these undesirable data are as follows:

(1) Health organization at village, district and regional levels for the provision of continuous health service throughout the country has not been developed.

(2) The impact of investments so far carried out in the health sector has not yet affected the rural majority.

(3) The available health manpower is mainly limited inside the Kathmandu valley. The health institutions outside the valley have not been able to obtain the required manpower.

(4) Brain drain especially among the persons and doctors sent abroad for higher study and training do not return back home has been a major problem of the brain drain.

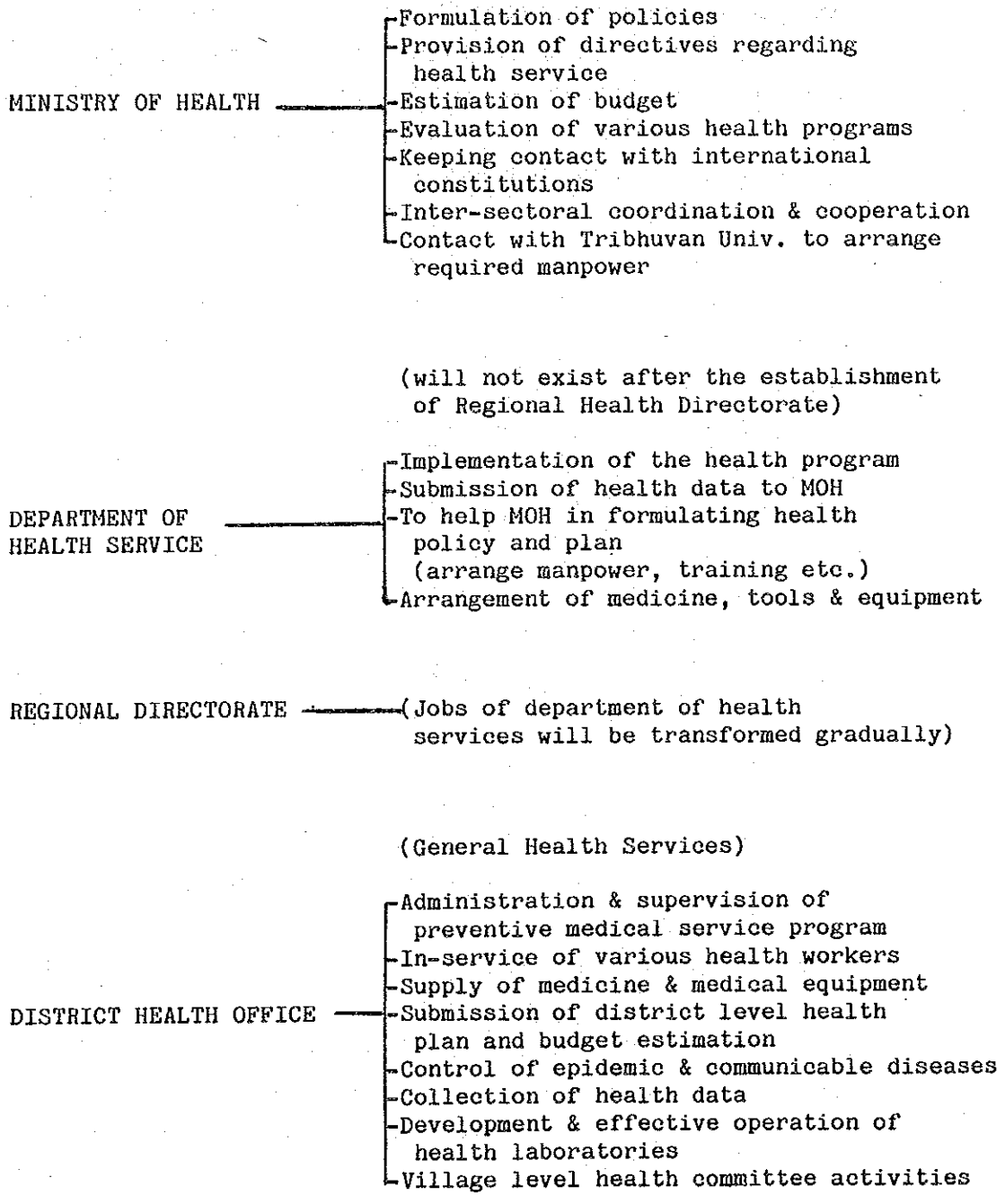
(5) Big hospitals even are not running efficiently. People complain of inefficient service to the patients.

(6) Existing health manpower has not been fully utilized because of lack of the tools, equipment, apparatus in desired quantity.

Existing regional hospitals or general hospitals lack pediatric medical services, and Kanti Children's Hospital in Kathmandu is an only institute. Infant diseases include digestive or respiratory ones are brought about from infections. Since there is only one hospital for children, many child patients can not benefit from the special care medical services.

2-3-2 Administration System

Public health services are executed by the Ministry of Health. The following figure is the administration system and the working procedure of the Ministry of Health.



2-3-3 Health Care and Medical Service Facilities

Table 2-2 Medical service facilities under the Ministry of Health
(as of 1984)

Item	Number	Function	Category	Division
HOSPITAL	76	Tertiary care	Referral hospital	Nationwide
		Special care	Special hospital	almost in Kathmandu
		Tertiary care	Zonal hospital	Region & Zone
		Secondary care	District hospital	District
HEALTH CENTER	27	Secondary care	Clinic with beds	District
HEALTH POST	744	Primary care	Clinic without beds	Panchayat
AYURVEDIC	113	Traditional care	Dispensary and Clinic	District Panchayat

Total number of 3,048 beds covering the above facilities is never sufficient in numbers.
(Administrative zonal map is in the Appendices.)

The functional services are categolized as follows:

Primary Care ..... [Health Post
[Ayurvedic

Secondary Care ..... [Health Center
[District Hospital

Tertiary Care ..... [Zonal Hospital
[Referral Hospital

Special Care ..... -Special Hospital
(for Pediatric, Maternity, Infection, Reprosy, Reprosy, Eye, EB, Mental)

Principal Hospitals in Kathmandu Valley are summarized and listed as follows:

Name	Category	Number of Beds
Tribhuvan Univ. Teaching Hospital*	General Hospital attached to IOM	300
Bir Hospital	General Hospital	300
Kanti Children's Hospital	Special Hospital (pediatrics)	150
Maternity Hospital	Special Hospital (obstetrics)	150
Eye Hospital	Special Hospital (ophthalmic)	100
Infection Disease Unit	Special Hospital (infection)	100
Royal Military Hospital	General Hospital	170
Patan Hospital	General Hospital	150
Shanta Bhawan Hospital**	General Hospital	135
Indian Embassy Hospital	Exclusive Hospital	10

* To be opened in December, 1984 (only Outpatient Dept. is under service at present)

** Operated by the United Mission, private voluntary group

Hospitals in 14 zones and some regional hospitals are available but some are with the facilities not sufficient for their primary health services. And there exist such districts without health centers. Medical service facilities other than above are Family Planning Center, Royal Drugs Ltd., Central Health Laboratory in Kathmandu Valley and Western Regional Health Laboratory in Pokhara.

Medical Facility Comparison List

Country	Number of Hospitals	Number of Beds	Population/Doctors
India	15,265	392,000	1,465
Sri Lanka	461	41,051	334
Thailand	315	51,765	808
Pakistan	---	39,512	1,903
Bangladesh	---	16,591	4,868
Burma	486	27,403	1,125
Nepal	76	3,048	5,733
(Japan)	(37,603)	(1,510,464)	(76)

(Source: U.N. Statistic Yearbook)

Medical Facility Future Plan:

	Future Plan		Actual Number	Rates
Number of Hospitals	99	:	76	76.77%
Number of Beds	4,665	:	3,048	65.33%

For example, Bir Hospital which is the biggest general hospital in the Kingdom of Nepal, is now under innovational construction of its hospital capacity up to 450 beds adding 150 beds. Maternity Hospital has a plan to add 50 beds to make the numbers up to 200.

2-3-4 Medical Manpower and Its Training Facilities

Activities planned and operated by the Ministry of Health for a period of 25 years time (Long-Term Health Plan) will come to an end in 1990 with the issues undermentioned in the medical facilities and manpower development.

	Future Plan		Actual Number	Rates
Doctors	928	:	571	61.53%
Nurses	3,971	:	1,986	50.01%
Health Inspectors	1,775	:	790	44.50%
Auxiliary Health Workers	2,725	:	1,389	50.97%

The training of the health manpower was being undertaken by the foreign countries in the past years until the Tribhuvan University, the only university in the Kindgom of Nepal established in 1959, has taken part in its production by the diploma courses in the Institute of Medicine from 1980 under the cooperation with the Ministryof Health.

Number of students in the course is listed as below:

Year	1979/80	1980/81	1981/82	1982/83	1983/84 (planned)
Number of Students	1,753	1,293	1,163	1,053	1,344

The cariculum and the breakdown of enrolled and output students are shown by the separate table.

Proposed Student's Enrollment & Estimated Manpower Production
by the Institute of Medicine during the Sixth Five-Year Plan

Level	Manpower Category and Length of Training	Fiscal Year	1982/83	1983/84	1984/85
Higher Level: Degree/Diploma following Certificate Level Training and Work Experience	General and Community Physician 4 years	Enrollment	28	28	28
		Output	16	20	30
	Post Basic Nursing (Midwife/Community Nurse) 2 years	Enrollment	16	16	16
		Output	12	14	18
Middle Level (Certificate)	Health Assistant 2-1/2 years	Enrollment	100	100	100
		Output	95	110	130
	Lab. Technician 2-1/2 years	Enrollment	-	-	-
		Output	15	19	9
	Radiographer 2-1/2 years	Enrollment	-	-	-
		Output	12	10	5
	Dipensing Pharmacist 2-1/2 years	Enrollment	20	-	-
		Output	10	10	10
	Staff Nurse/Midwife 3 years	Enrollment	100	100	100
		Output	60	60	90
	Ayurvedic Kabiraj 3 years	Enrollment	20	-	-
		Output	17	17	16
	Sr. A.H.W. 3 months	Enrollment	60	60	60
		Output	55	60	65
	Sr. A.N.M. 3 months	Enrollment	40	50	50
		Output	39	44	44
Basic Level	A.N.M. 2 years.	Enrollment	240	240	240
		Output	260	250	250
	C.M.A. 1 year	Enrollment	180	180	240
		Output	140	150	160

upper row : enrolled number

lower row : output number

Remarks:

Output figures are approximate and take into account attrition and delayed completion of courses.

Following courses are set up for the education of professional doctors. After completion of four years of Batchelor course, they go through two-year clinical training course, another two-year training at local medical facilities as generalist doctors. Then they finish the final training as specialists in institutions authorized as specialist training facilities (Kanti Children's Hospital is an authorized Specialist Training Hospital) to be acknowledged by an authority composed mainly of Nepal Medical Association. Before 1983 certification of doctors and specialists were done in India, but since the reorganizationof a Tribhuvan University Teaching Hospital, this procedure became possibly managed in Nepal.

Nurses are trained in the three nursing schools under the administration of Institute of Medicine, Tribhuvan University. After completion of three year training of a certificate level, they become staff nurses. Higher level nurses (Bachelor level) go through, after the certificate level, clinical experiences over three years as nurses or assistant teaching staffs, and with recommendation from where they belong the Ministry of Health grants the certificate. Training at Bachelor level last two years during which time they, together with nursing staffs, are trained in Kanti Children's Hospital, Tribhuvan University Teaching Hospital, Bir Hospital or Maternity Hospital.

2-3-5 Present and Future Issues on Health and Medical Conditions

His Majesty's Government of Nepal set out the people's knowledge on health care and hygiene as one of the key factors in effectively persuing National Economic Development Plan, therefore in parallel with the plan, the Ministry of Health is enforcing the Long-Term Health Plan. During the course, various medical and health care activities to rise the standard of living have been laid down including prevention of infections, family planning, construction of primary health care facilities, native therapy (Ayurvedic), education of medical manpower, advocation of knowledge on hygiene, development of national pharmaceutics production and flexible application of system of paying wards.

The difficulties they are facinig are geographical and economic problems, lack of knowledge on hygiene and insufficient nourishments due to low educational background. These end up with phenomena in health care area as various structural diseases caused by infections. To cope with this, specialized medical centers such as regional hospitals, health centers and health posts are planned to be organized throughout the nation, but concentrated to Kathmandu and its vicinity, however this will be far from satisfaction. Hence, it is most important to consolidate the equipped hospital which will have a leading role in bringing up the medical forces and will increase the level of diagnosis and therapy as a reference hospital.

The comparative statistics are shown as of 1976:

	Nepal	India	UK
Population/doctor	34,000	4,300	830
Population/nurse	40,000	8,800	320
Population/bed	5,733	1,666	120

High rate of mortality of newborns and infants under five years old is the main reason for the short life expectancy which is a great loss to the nations's economic development. Therefore the medical and health care is a project of utmost urgency and importance. The Ministry of Health, among the plans to further improve the medical care by equipping the existing hospitals, which is one of the fundamental target in the sixth Five-Year Plan, emphasizes the urgent requirements of improved infant care.

At the same time, in-country education of medical staffs will be expected when the students of Institute of Medicine, Tribhuvan University will graduate as well as the Nursing School now under construction planning. This will decrease the dependence on foreign countris in educating the doctors and will slow down the brain drain. Improved medical service conditions together with national education of medical staffs will interact to produce fruitful results.

CHAPTER 3: BACKGROUND OF KANTI CHILDREN'S HOSPITAL

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3-1 OUTLINE OF LOCATION

Kanti Children's Hospital, neighbouring to the Tribhuvan University Teaching Hospital, 3 kilometers north-east from the center of Kathmanzu, the Capital of Kingdom of Nepal, sites close to a Nursing school now under construction planning, forming a new medical complex in Nepal. Therefore many works are being done to the infrastructure.

Roads:

Main road to Kathmandu is Birganj - Kathmandu, which became routed via Birganj - Hetauda - Bharatpur - Kathmandu thus in spite of longer travel, minimized the height level difference of the road, resulting in convenience of traffic including truck deliveries and in shorter of the transportation time. Most of the roads in Kathmandu are paved on which buses are the primary means of transportation, with some small three-wheeled vehicles.

Electricity:

Total electricity generation now is 107,040 KW. Construction of power plant at Kulekhani NO.1 two years ago increased the stable supply far better than before. Occasional power failure is seen mainly due to thunders.

Sewage:

Sewage lines are rare even in Kathmandu. Except the accessibility to the hospital and water drainage, other infrastructures like electricity and telephone system appear to be in a fair condition.

3-2 OUTLINE OF KANTI CHILDREN'S HOSPITAL

3-2-1 Infrastructure

1) Access and premises roads

Kanti path about 100 meters long in the east of the premises is the access road. This is scheduled to be paved within this year.

2) Water Supply

Along with the above access road, water supply main is piped underground.

3) Sewage

Water is discharged to a river at 300 meters distance east of the premises.

4) Electricity

High and low voltage supply line runs along the main road 100 meters east of the campus.

5) Telephone

2 external line telephone services are available.

3-2-2 Organization and Budgetary Status

(1) Medical Service System

Departments as the pediatric hospital are:

Internal Medicine,
Surgery,
Dentistry,
Clinical Pathology,
Radiography, and
Pharmacy.

Number of beds with its distribution (figures in the parenthesis are planned ones as of the end of fiscal 1984):

Category	Number of Beds	Number of Beds (planned)
Medical	60	(90)
Surgical	20	(40) including 4 neonatal beds
NICU	4	(8)
Rehydration	4	(6)
ICU	0	(6)

Paying beds of 27 out of existing beds and the fee for occupancy is as follows:

3 x 6 beds ward	18 beds	-	Rs. 10/day
1 x 4 beds ward	4 beds	-	Rs. 15/day
2 x 2 beds cabin	4 beds	-	Rs. 20/day
1 x 1 bed cabin	1 bed	-	Rs. 30/day

The rest are free beds.

Free medical care service is the principle. The hospital system is that the patient comes to the hospital and is generally seen in the Outpatients Department first. For this the patient comes to the foyer of the OPD and on payment of Rs. 1, he gets a card (Karte) with which he is seen in the internal medicine, surgery or dentistry department. If his illness is of such nature that it warrants admission, then he is admitted under the concerned physician or surgeon either in the free bed or on the paying bed of the hospital. Generally those from outside of Kathmandu Valley and those of poor economic status are admitted in the free beds where most of the drugs, food are free and there is no charge for X-ray and laboratory services whereas in others a nominal chrge amounting

to a quarter of the regular charge is made. The patient gets some of the drugs e.g. multi-vitamins, penicillin supplied free, but may have to buy some medicines. For this there is a shop within the hospital compound which sells medicines at a slightly cheaper rate than at the market. These patients have to pay regular charges for X-ray and laboratory services. Meals are provided free to the free patients while the paying patients are not.

All outpatient departments function from 9:00AM to 2:00PM but the rehydration unit of the Internal Medicine functions daily from 9:00AM to 8:00PM. There is also a Nutrition Clinic which is presently functioning once a week. The emergency functions for 24 hours, 7 days a week.

For these services, eight medical officers regularly work with the allotment of six doctors for OPD, one doctor for Ward and one doctor for Emergency Department.

(2) Administration System

Kanti Hospital has been functioning as a children's hospital from July 1970. Before that it had been functioning as a general hospital with some pediatric beds. As the hospital is only pediatric hospital in the country, it means that the level of medical care to be provided should be of the highest level corresponding to the the tertiary service and in the position to admit the patients from outside of Kathmandu Valley. There exists Kanti Children's Hospital Management Committee which was constituted one year ago under the Assistant Superintendent as the chairman has been functioning to manage the hospital. The organization chart is shown in the article 6-1 Implementation Organization in the Chapter 6.

(3) Budgetary Status

Running costs of 1984 (actual)

Income from:	Outpatient tickets	Rs.11,919.00
	Paying beds	Rs.55,016.00
	X-ray	Rs.49,281.00
	Laboratory	Rs.56,705,00
	Total:	Rs.172,921.00
Outlay to:	Personnel pay	Rs.727,342.00
	Benefits(allowance etc.)	Rs.172,223.00
	Food & Milk	Rs.178,000.00
	Medicine & Equipment	Rs.200,000.00
	Others	Rs.169,915.00
	Total:	Rs.1,447,480.00

The difference is to be supplemented by the governmental grant which was as follows (1984):

Regular	Rs.1,600,000
Development	Rs.3,000,000
Total:	Rs.4,600,000

3-2-3 Medical Service Statistics

Medical service statistics of the hospital are as follows:
(April, 1983 to March, 1984)

Department	Number of Outpatient	Number of Inpatien t
Internal Medicine	7,041	4,122
Surgery	9,105	363 (Operation: 312)
Dentistry	785	0
Total	26,931	4,485

Medical Demand:

Year	1975	1976	1977	1978	1979	1983
Outpatient	16,866	17,466	17,995	17,713	17,914	20,172
Inpatient	2,422	2,473	2,663	2,454	2,672	3,319

Laboratory Investigations:	Urine	4,008
	Stool	6,152
	Blood	7,122
	Biochemistry	1,800
	Bacteriology	3,844

X-ray total number of plates taken: 3,728

Disease tendency of the patients is shown as follows:

(Out of 17,041 cases of the yearly patients)

1) Diarrhoeas	6,129	36.15%
2) Upper Respiratory Tract Infections	3,089	18.22%
3) Bronchitis, Bronchopneucemonia and Pneumonia	2,875	16.96%
4) Pertussis	562	3.32%
5) Tuberculosis	369	2.81%
6) Skin Infections	367	2.17%
7) Urinary Tract Infections	328	1.93%
8) Eye & Ear Infections	227	1.34%
9) and others		

These are communicable diseases which are the resultant outcome of poor sanitation by illiteracy and malnourishment by widespread poverty over the whole field of ages not limitted to children.

Number of surgical procedures carried out in hospital for the year 1982 to September, 1984.

1)	Inguinal Hernia & Hydrocele	50 cases
2)	Vesical Calculus	32 cases
3)	Rectal Polyp	25 cases
4)	Cleft Lip and Cleft Palate	21 cases
5)	Urethral Stone	20 cases
6)	Burns Contracture	15 cases
7)	Abscess	10 cases
8)	Phimosis	10 cases
9)	Chronic Osteomyelitis	10 cases

3-2-4 Existing Facilities

(1) Building

Kanti Children's Hospital, constructed by the aid of the Soviet Union in 1965 as a general hospital, and situated in the premises of Tribhuvan University, Institute of Medicine, started service in 1972 as an only specialized hospital for children in the country.

The building was innovated as the increased medical demand adding the new building attached to the old one. The old building has 2 stories with reinforcement structure of partly made of brick.

1st floor is comprising of:
- Outpatient Department (under innovation for use of casualty dept.)
- Surgical Ward (20 beds)
- Administration Office

2nd floor is compsiring of:
- Operation Theater (under innovation)
- Surgical Ward (20 beds)
- Sterilization Room

The building with the space of about 1,500m^2 is rather wearied in some parts. The innovated building constructed with the combination of 2 stories and 3 stories with reinforcement structure of partly made of brick is compriging of:

1st floor:

Outpatient Department
Clinical Laboratory
Pharmacy
Ward (30 beds)
Physiotherapy Room
Play Room

2nd floor:

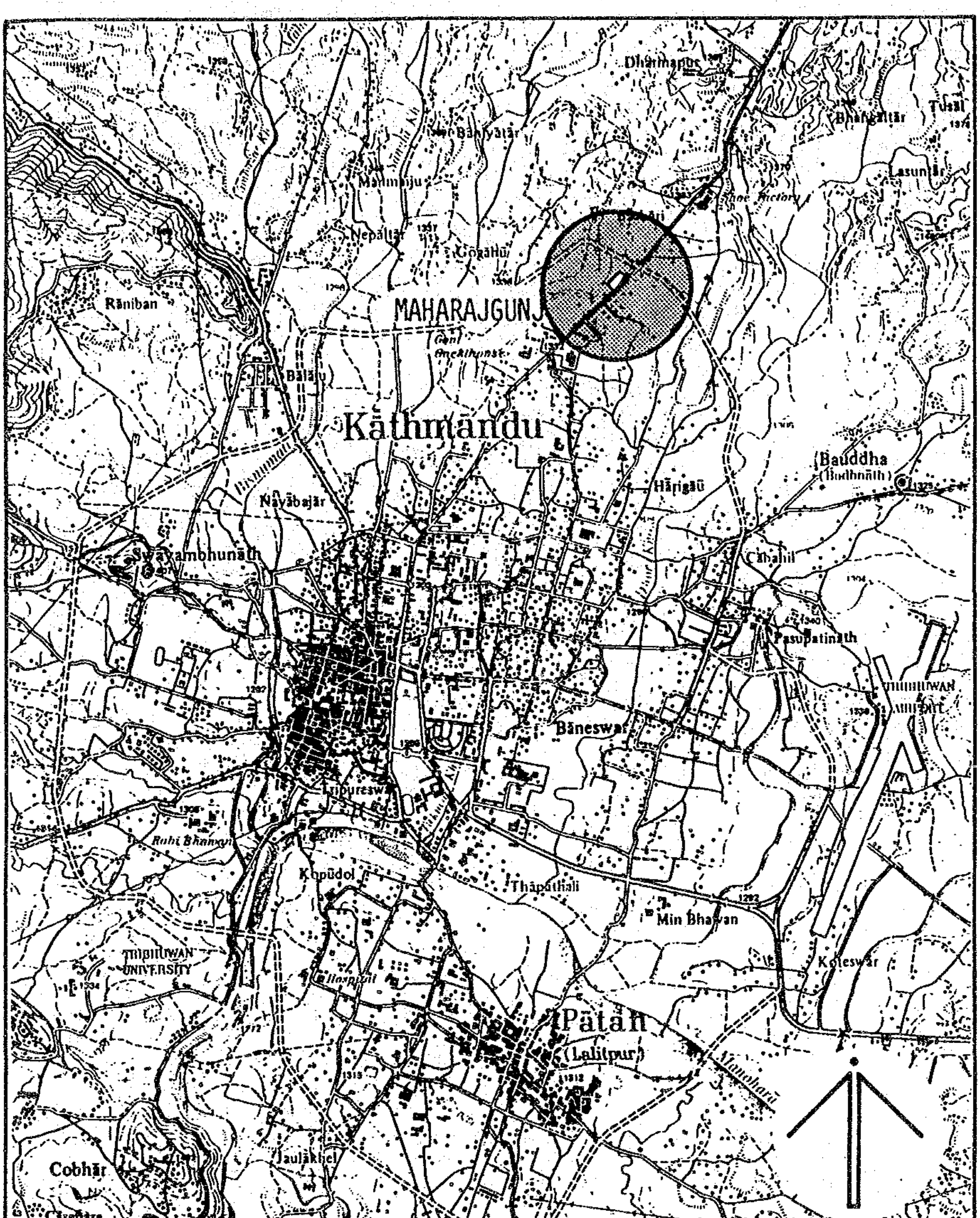
Paying Ward (30 beds)
Ward (Neonatal bed of 24) - 6 beds are now occupied and 8 beds are planned to operate as Intensive Care Baby Unit
Medical Staff Room
Library

3rd floor:

Ward (24 beds) - Used as Surgical department because of the same is under construction

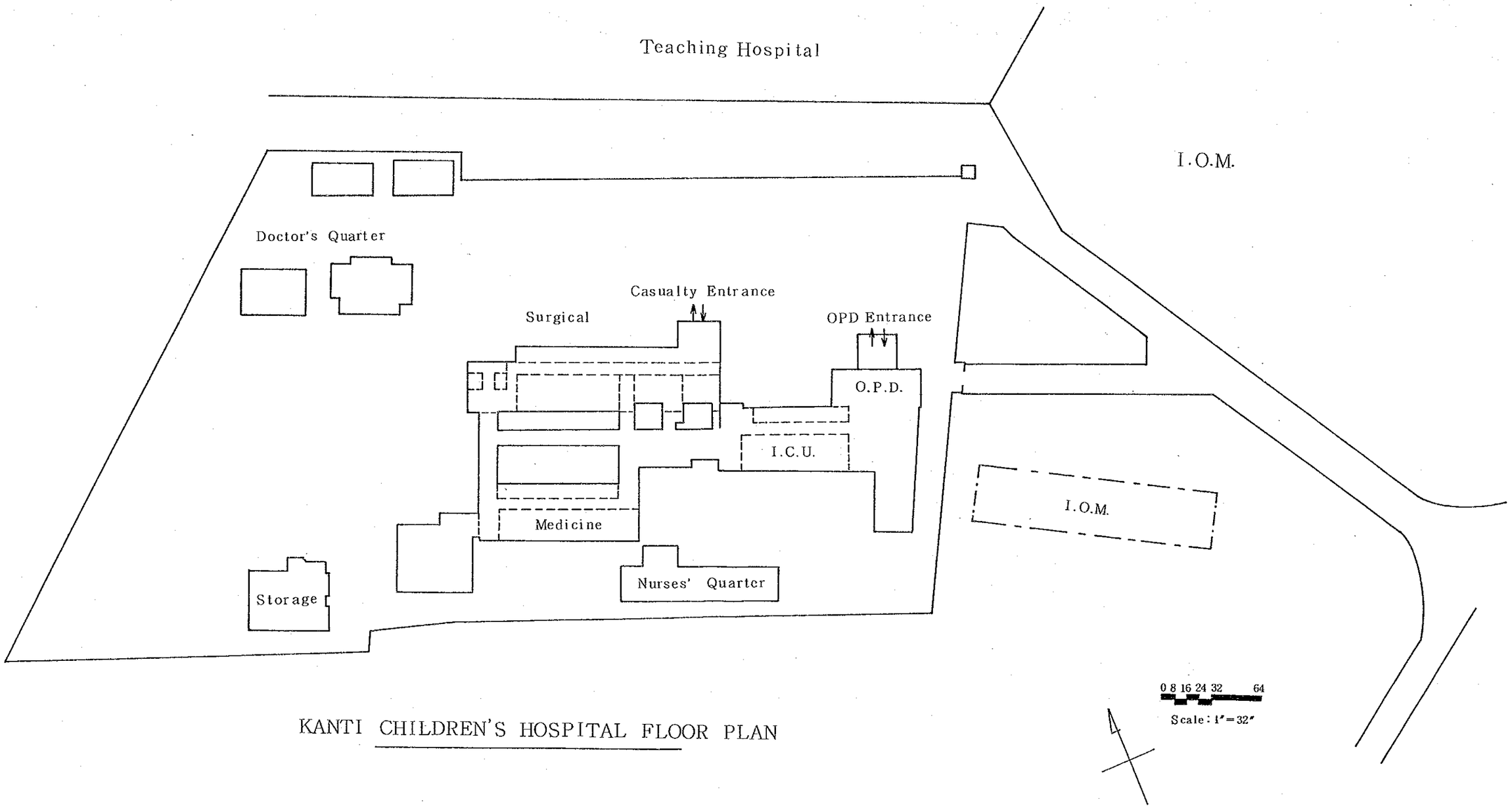
The total space makes about 3,000m^2.

The old building is so wearied that the new building is under construction to make its total capacity up to 150 beds with fully expanded for the future re-equipment. Beside the above, quarters for doctors and nurses including the service facility are in the premises. The floor plan is followed. (Fig. 3-2)



Dharmapur
Bhangaltar
Tusal
Lasuntar
Banyatar
Manmaiju
Shoe Factory
Nepaltar
Gongabu
Raniban
MAHARAJGUNJ
Balaju
Kathmandu
Bauddha
Harigau
Nayabajar
Swayambhunath
Cahabil
Pasupatinath
Baneswar
Thapathali
Min Bhawan
TRIBHUWAN UNIVERSITY
Koteswar
Patan
(Lalitpur)
Cobhar
Jaulakhel
Khanagau
Motitar
Ocu

SITE MAP



KANTI CHILDREN'S HOSPITAL FLOOR PLAN

Fig 3 – 2

(2) Medical Equipment

The existing equipment and facilities are as follows.

General Medicine :	Portable Suction Unit	2
	Oxygen Cylinder (500lit.,1500lit.)	15
	Examining Table	5
	Instrument Table	3
	Cylinder Truck (1,500lit)	4
	I.V. Stand	6
	Treatment Table	1, and
	Others	
Outpatient Dept. :	Operating Table (adult use)	1
	Anesthesia Machine (adult use)	1
	Electrosurgical Unit	1
	Operating Instrument Set (adult use)	2
	Operating Light (stand type)	1
	Instrument Tray Table	1
	N2O Cylinder (3.4lit.)	4
	Autoclave (small size)	1
	Hot Air Sterilizer	1
	Instrument Cabinet	2
	Instrument Table	2, and
	Others	
X-ray Dept. :	X-ray Unit	1
	Developing Tank Set	1
	Film Dryer	1
Dental Dept. :	Dental Unit	2
	Dental X-ray Unit	1, and
	Others	
Clinical Pathology Laboratory :	Hot Air Sterilizer	2
	Micro Centrifuge	1
	Microscope	1
	Spectrophotometer	1
	Centrifuge (desk-top type)	1
	Incubator	1, and
	Others	
Neonatal Unit :	Infant Incubator	1
	Baby Bed	6
	Phototherapy Unit	1, and
	Others	
Ward :	Patient Bed (child use)	90
	Utility Cart	4
	Oxygen Inhaler Set	8, and
	Others	

Most of the equipment is old model. Operating instruments are almost for adult and not for child which makes the operation procedures difficult to perform. Equipment for the clinical tests newly procured is limited to the essential ones for the tests, while the equipment for neonatal care and nursing utensils for ward have never equipped so far.

(3) Incidental Facilities

Water Supply

Water from the municipal supply is stored in a reservoir (2,000 English gallons) which then is pumped up to another (1,600 English gallons) at an elevated height to be distributed to surgical or ward facilities.

Sewage Line

In the building two distinct lines, sewage and miscellaneous, the former after being purified, with a reservoir capacity of 225 people, is discharged with miscellaneous waste water into a nearby river. Both lines are gravity dependent.

Medical Gas Supply

At the present time oxygen and nitrous oxide are used, which are supplied by portable cylinders.

Electricity

Three phase four wire electricity at 400/230 volts 50 hertz is distributed to wards (2 lines) and kitchen block (1 line), via main switches to switch board. Electrical motors are rated for 400 volts while lights and outlets (receptacles) are 230 volts. Present capacity for both lines is about 235 KVA, but at low voltage.

3-2-5 Funotion

(1) Function as a Training Institute

Kanti Children's Hospital has been functioning as the practical training center not only for the diploma course students of IOM, Tribhuvan University but also for the students of the Nursing School to be constructed in a near future, as well as provision of its medical care service. And, the hospital was approved for training of candidates appearing in the examination conducted by the National Board of Examinations in India in March, 1983. Therefore, the hospital's function as the institute of the medical and technical training is identified. But, as the actual medical manpower enrolled is not sufficient for the function as the referral hospital in number, the following personnel plan was made. With this, the hospital will be corresponded to the required and also identified level.

Table 3-1 Kanti Children's Hospital Medical Personnel

Doctors	Actual Number	No. at the end of fiscal 1984
Medical Department		
Consultant Pediatrician	4	(4) + 3
Medical Officer	8	(8) -
Medical Registrar from the Teaching Hospital	2	(2) -
House Officer	-	+ 5
Pediatric Surgery		
Consultant Surgeon	2	(2) -
House Officer	-	+ 1
Pathology		
Consultant Pathologist	1	(1) -
Radiology		
Visiting Consultant from the Teaching Hospital	1	(1) + 1
Dental		
Dentist	2	(2) -
Total:	20	(20) + 10 = (30)
Regular staff	16	10 (26)

Nurses	Actual Number	No. at the end of fiscal 1984
Matron	1	(1) -
Sister	3	(3) + 2
Sraff Nurse	10	(10) + 33
Assistant Nurse Midwife	5	(5) -
Total:	19	(19) + 35 = (54)
Paramedical Stuffs	Actual Number	No. at the end of fiscal 1984
Auxiliary Health Worker	4	(4) + 2
Laboratory Technologist	1	(1) -
Laboratory Technician	7	(7) -
X-ray Technicians	2	(2) + -
Physiotherapy	1	(1) -
Medical Record Officer	2	(2) + 1
Total:	17	(17) + 3 = (20)

(2) Function as the Reference Hospital

Kanti Children's Hospital has another function as a reference hospital. However due to the historical dependence on foreign countries in educating doctors, reference function of the hospital does not meet the exact Nepalese requirements. An example is that doctors who have received overseas training on medicine and medical professional techniques do not find for themselves, after returning to home country, an optimal environment to make full use of their skills and talents owing to the under-equipped hospitals such as Kanti Children's Hospital.

Since Tribhuvan University Teaching Hospital constructed by the Grant Aid of Japan will start its full function, and the onstruction plan of the Nursing School will be implemented in the near future, the conditions for educating medical personnel within the country have been settled. These conditions will enable to improve the pediatric medical and emergency care by experiencing the various clinical situations, leading to a more consolidated genuine reference in pediatric field in Nepal. For the realization of the above, facility with sufficient and required conditions is necessary, and the only hospital to meet these is Kanti Children'sHospital. However, as said before, the equipment in this hospital is not adequate as a reference hospital, it is hoped that the hospital will be a reference in its virtual meaning by equipping to the required standard.

3-3 FUTURE EXPANSION PLAN

A master plan is being prepared for the hospital's expansion in the next 25 years by which the hospital is expected to have total 250 beds. The building program of the plan is as follows.

Future Program		Present Conditions
1) Private wing consisting of 50 beds	:	27 beds
2) Operation Suite	:	under innovation in the old building
3) Outpatient Unit	:	small space
4) Accident and Emergency Unit	:	under innovation in the old building
5) Administrative Unit	:	not spaced
6) Laboratory Unit	:	small tests only serviced
7) New X-ray and Ultra Sound Unit	:	not fully facilitated
8) Auditorium	:	not spaced
9) Canteen	:	not spaced
10) Staff quarte and a accommodation for the patients of sick child	:	not spaced
11) Parking Area	:	not fully facilitated

Medical demand says that number of outpatient and inpatient increases by 1.6 times and 1.9 times respectively in the last 9 years. It is anticipated that the same number increases still as the Teaching Hospital fully operated. Then Kanti Children's Hospital, as the referral hospital in the medical complex, will have to be re-equipped both in number and quality.

The items to be improved and the countermeasures with the future master plan are as follows:

(1) Running Costs:

Official request for the increment of the yearly governmental grant,

Expectancy for the paying patients,

Raising of some funds from the public and non-governmental organizations.

(2) Medical Service

Start of Anesthetic Department,

Strengthening of Emergency Department,

In-hospital drug selling,

Accommodation for visitors from distance.

(3) Health Manpower

Official request already applied for the staff increment for fiscal 1984 as already shown in the Table 3-1 of 3-2-5 Function.

Training unit for the specialists from abroad is comprising of:

* Improvement of Anesthetic Department (Pediatric) Cooperated with the Teaching Hospital
* Improvement and training of nurses in the field of Neonatal Unit and Operation Unit
* Improvement of Clinical Pathology
* Improvement of Radiological Diagnosis
* Improvement of Hospital Administration

(4) Improvement of Medical Equipment

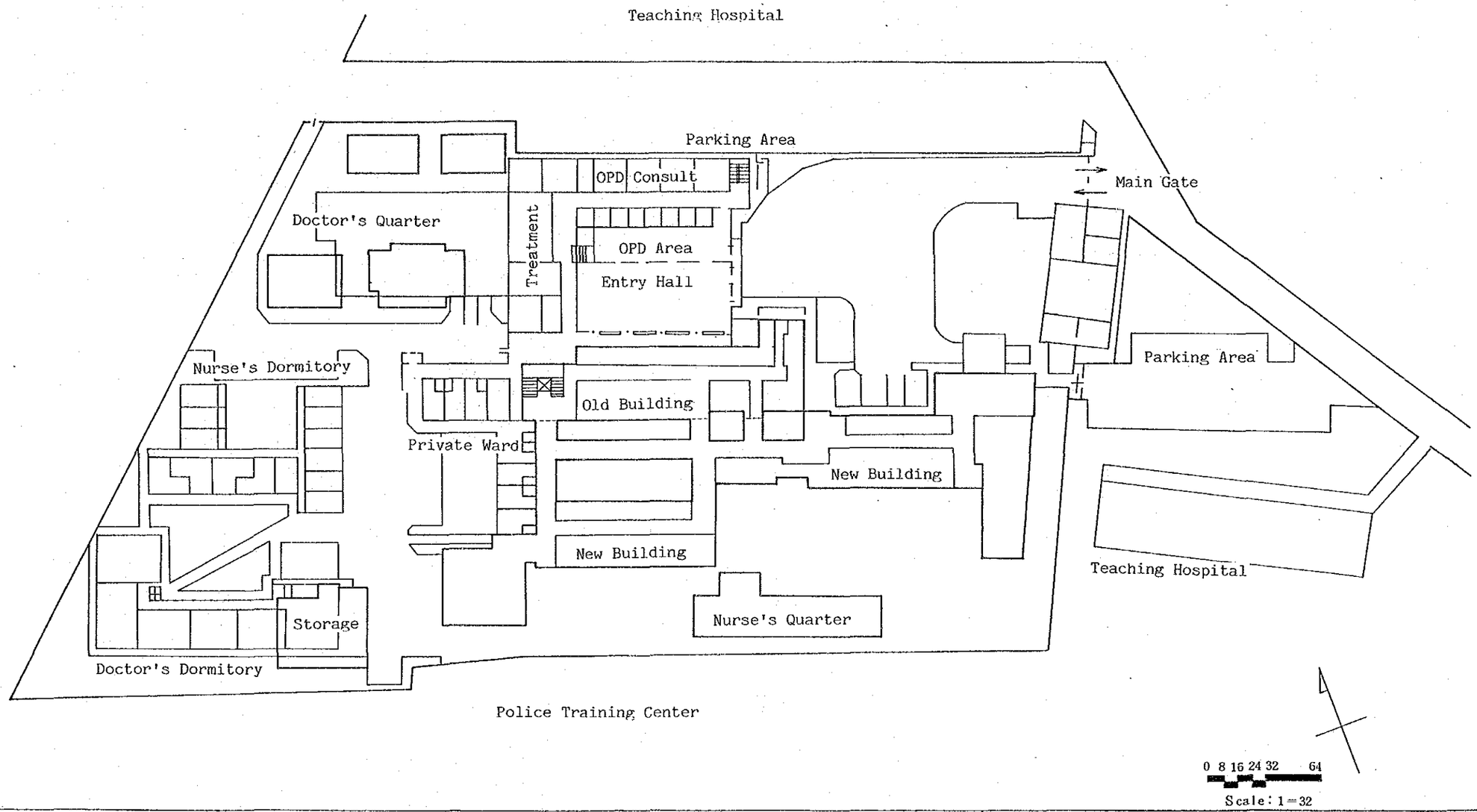
(Re-equipped plan will be fully executed by the Project)

(5) Building innovation

(6) Building maintenance

* Repair of the old building and the construction of the access roads

The master site plan is followed. (Fig. 3-3)



EXPANSION PROPOSAL FOR KANTI CHILDREN'S HOSPITAL

Designed by S.N. RIMAL Engineers and Architects Pvt. Ltd.

Fig 3 - 3