JAPAN INTERNATIONAL COOPERATION AGENCY

THE KINGDOM OF NEPAL
MINISTRY OF HEALTH

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

MAY, 1993

YAMASHITA SEKKEI INC.

JICA BASIC DESIGN STUDY REPORT ON THE PROJECT FOR THE EXPANSION OF KANTI CHILDREN'S HOSPITAL IN THE KINGDOM OF NEPAL MAY, 1993 YAMASHI

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PREFACE

In response to a request from the Government of the Kingdom of Nepal, the Government of Japan decided to conduct a basic design study on the Project for the Expansion of Kanti Children's Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Nepal a study team headed by Dr. Makiko Kinoshita, Department of International Cooperation, National Medical Center Hospital, Ministry of Health and Welfare, and constituted by members of Yamashita Sekkei Inc., from December 6, 1992 to January 6, 1993.

The team exchanged views with the officials concerned of the Government of the Kingdom of Nepal and conducted a field survey at the site of the proposed project. After the team returned to Japan, further studies were made. Then, a mission headed by Dr. Seiki Tateno, Department of International Cooperation, National Medical Center Hospital, Ministry of Health and Welfare, was sent to Nepal in order to discuss the draft report from March 28 to April 6, 1993 and the present report was prepared.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Kingdom of Nepal for their close cooperation extended to the teams.

May, 1993

Kensuke Yanagiya
President
Japan International Cooperation Agency

May, 1993

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for the Expansion of Kanti Children's Hospital in the Kingdom of Nepal.

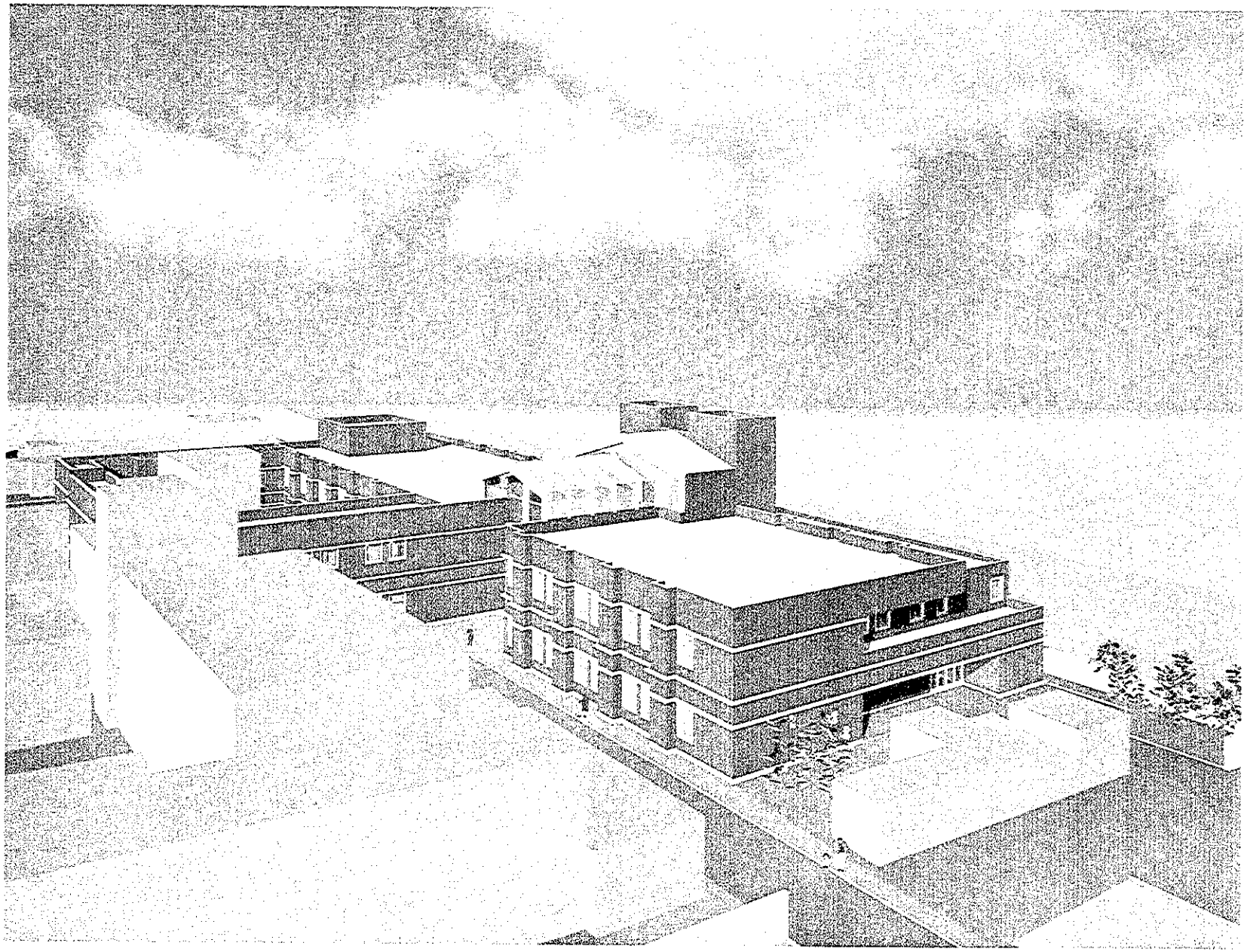
This study has been made by Yamashita Sekkei Inc., based on a contract with JICA, from Dec. 2 1992 to May 17 1993. Throughout the study, we have taken into full consideration of the present situation in Nepal, and have planned the most appropriate project in the scheme of Japan's grant aid.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs, Ministry of Health and Welfare and Embassy of Nepal in Japan. We also wish to express our deep gratitude to the officials concerned of Ministry of Health, JICA Nepal office, Embassy of Japan in Nepal for their close cooperation and assistance during our study.

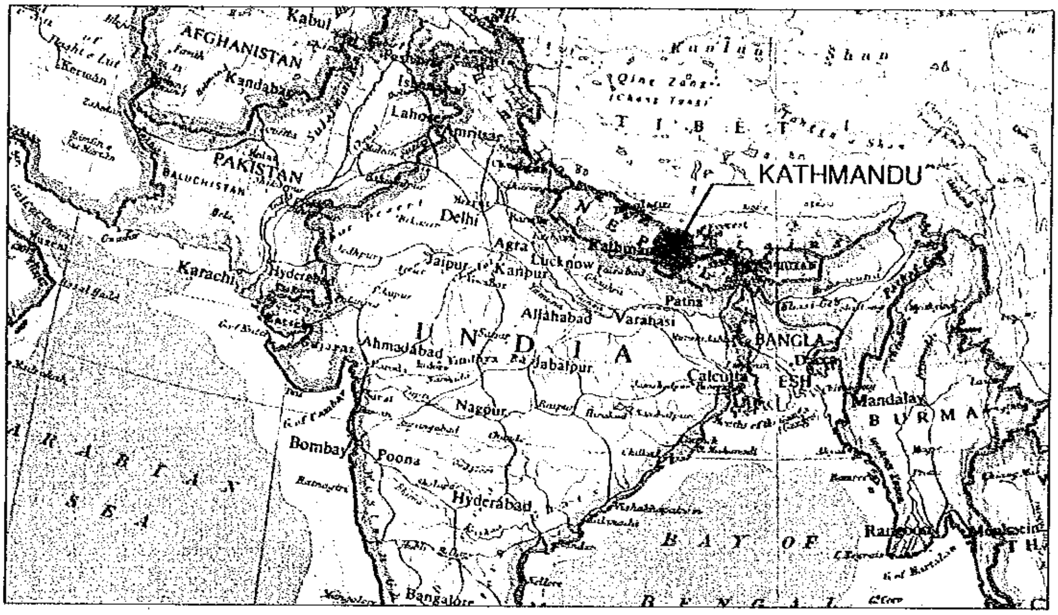
At last, we hope that this report will be effectively used for the promotion of the project.

Very truly yours,

Ken Majima
Project Manager
Basic design study team on
the Project for the Expansion
of Kanti Children's Hospital
Yamashita Sekkei Inc.



Kanti Children's Hospital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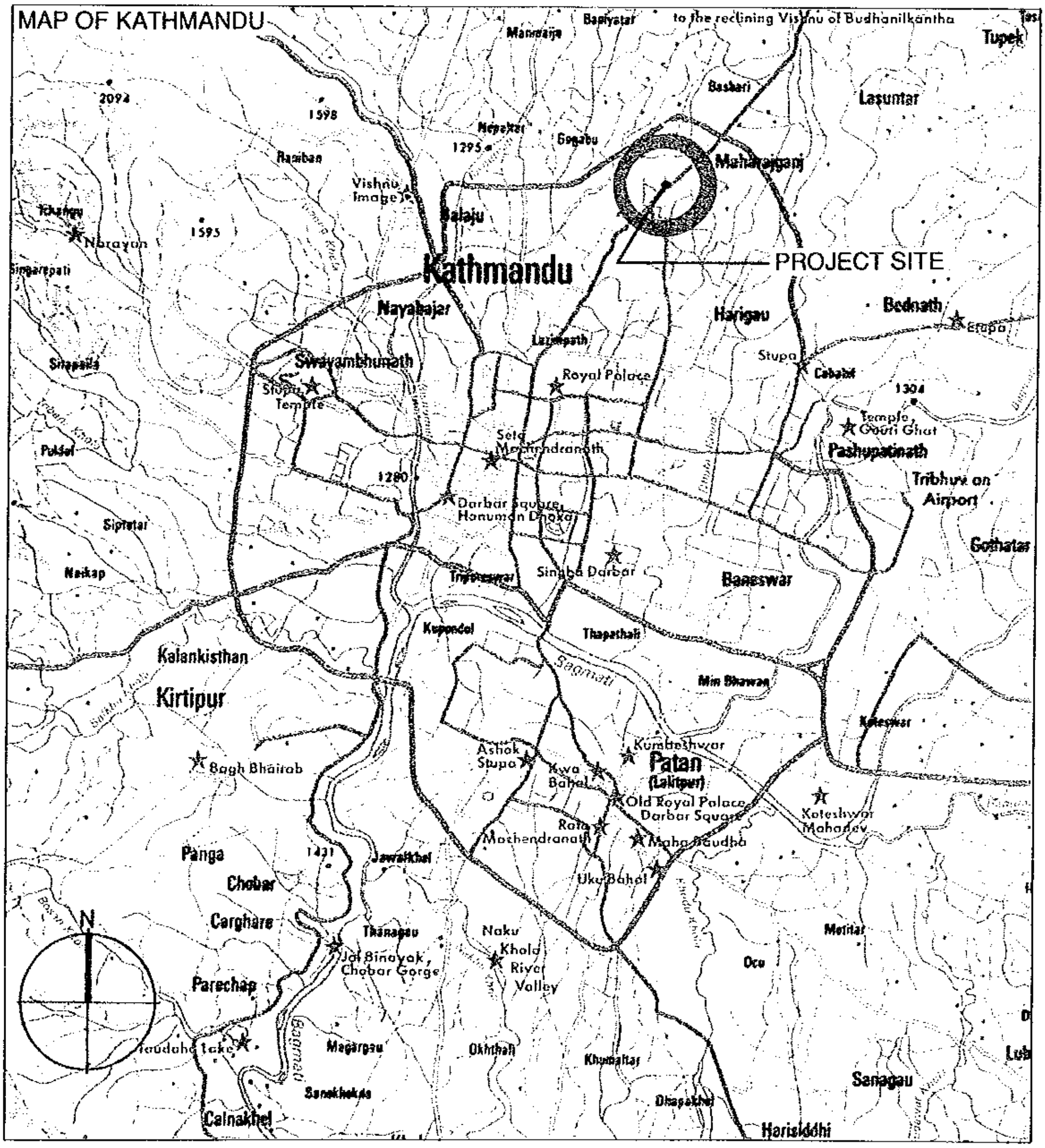
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to the reclining Vishnu of Budhanilkantha
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PROJECT SITE
Vishnu Image
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Nayabajar
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Bodnath
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Nakhu Khola River Valley
Parechap
Taudaha Lake
Magargau
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Calnakhel
Dhapakhel
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Project site

SUMMARY

SUMMARY

The 1991 Nepalese census showed that the Kingdom of Nepal had a population of 18,462,681 of which 43 percent were children under the age of 14. More than 90 percent of the country's population were engaged in agriculture or occupations related to agriculture, scattered across the country. Since Nepal is a mountainous country, 50 percent of the residents of the country's rural areas live far away from roads, which represents a major hindrance to the spread of health care service across the country. It is said that 70 percent of the national income of the country is not incorporated into the country's market economy since most people live in self-sufficiently. This means that children's labor is much in demand. Boys aged 6 to 9 work three hours a day, and those aged 10 to 14 work five to six hours a day. It is said that girls in the corresponding age groups work twice as long as these boys. Such young labor force with a lack of adequate toilets, the poor quality of drinking water and an unsanitary living environment (many households are living together with domestic animals) have resulted in the very high morbidity and mortality rate for children.

In the Kingdom of Nepal, little attention had been paid to the children in Development, and it was taken up for the first time in the government of the Kingdom of Nepal's 7th five-year plan (1985~90). With the United Nations "World Summit for Children" in 1990 as a trigger, the National Planning Commission published a guidebook titled "National Programme of Action for Children & Development for the 1990s" in January 1992. The guidebook was intended for use by the country's government ministries and agencies to promote the Children in Development under the country's 8th five-year plan.

As a result of the democratization movement in 1989, a drastic review was made of the previous five-year plans, and the 8th five-year plan (1992~97) was launched two years later than scheduled. The same health care guidelines as in the previous five-year plans apply in this five-year plan, and therefore policy measures to achieve the goal of "Health for All by the Year 2000" are also being taken under this five-year plan.

The 8th five-year plan has four main goals -- (1) securing the necessary number of health care staff for the improvement of the country's health care, (2) provision of primary health care services to residents of rural areas, (3) population control and (4) development of specialized medical services -- and as many as 11 concrete policy measures were formulated to attain these goals. These policy measures include programs to promote vaccination and guidance on nutrition for the health and welfare of children and a program to increase the number of beds at the Kanti Children's Hospital by 150 as part of the central government's plan to increase the number of hospital beds by 1,165 by 1997.

In the Kingdom of Nepal, health care for children started with the addition of a pediatric department to the Bir Hospital in 1957. It became full-fledged when the Kanti Children's Hospital opened with 50 beds in 1970. The facilities of the children's hospital were gradually expanded. In 1984 the number of beds at the hospital was increased to 150. In 1984 the Japanese Government implemented a project to improve the medical equipment of the Kanti Children's Hospital. As a result, the hospital's medical equipment was greatly improved. At present, the hospital's facilities and equipment have the highest standard as a children's hospital in the country.

In recent years, there has been a marked increase in the number of outpatients treated at the hospital. Over the past five years the number

of general outpatients has increased by 1.58 times and Emergency patients have increased by 2.81 times. The hospital's inpatients ward has been operating beyond capacity for more than five years. In addition, the existing building, which was constructed in 1963, has become so superannuated that the hospital is finding it increasingly difficult to offer satisfactory medical services.

To resolve these problems, the government of the Kingdom of Nepal has drawn up a "project for the Expansion of the Kanti Children's Hospital." Due to budgetary limitations, however, the government of the Kingdom of Nepal made a request to the government of Japan for grant aid assistance for the project in August 1992.

In response, the government of Japan decided to conduct a survey of the project, and in September 1992 the Japan International Cooperation Agency sent a preliminary study team to the Kingdom of Nepal to confirm the background and details of the project by discussing them with representatives of the government of the Kingdom of Nepal. As a result of the study, the Japan International Cooperation Agency concluded that it was necessary to conduct a basic design study to establish the feasibility of grant aid for the project, and in December 1992 it dispatched a basic design study team to the Kingdom of Nepal. The basic design study team discussed the details of the project with representatives of the government of the Kingdom of Nepal, investigated the hospital's existing facilities and the project site, and collected related data and information, on the basis of the results of the preliminary study. After analyzing the results of the basic design study and briefing for representatives of the government of Kingdom of Nepal on the contents of the draft report in March 1993, the basic design study team prepared this final basic design study report.

The basic design study team concluded that the old existing building, which is small and superannuated, should be partially demolished and that a new building should be constructed in the garden located on the northern side of the existing building. According to the team's plan, facilities of the Outpatient, Emergency department and Central diagnosis department should be located on the ground floor of the new building, and those of the Operating, Central Supplies, Intensive Care and Clinical Laboratory department on the first floor. At the same time, the interiors of the new existing building should be remodeled so that the ward's facilities may be expanded. On the basis of the above-mentioned conclusion, the basic design study team drew up a basic design plan for the facilities and equipment necessary for the new building and the new existing building. The outline of the projected facilities and equipment is given below:

Project site	:	the premises of the Kanti Children's Hospital, Maharajgunj, Kathmandu	
Structure	:	2-stories reinforced concrete building (part of which is to be 3-storied)	
Total Floor Area	:	New building	6,595.12m^2
		Remodeled facilities	2,772.0 m^2
		Total	9,367.12m^2

Main divisions and their facilities

Outpatient	:	medical, surgical, dental, ORT, waiting room
Emergency	:	examination room, treatment room, observation room
Ward	:	medical ward, surgical ward
Intensive care	:	NICU PICU
Central diagnosis	:	operation theatre, laboratory, medical imaging diagnosis, central supplies department
Training/research	:	Library

Others : nutrition, housekeeping room, locker rooms, etc.

Equipment

making up for the deficiency and replacing superannuated equipment

It will be advisable to implement the project in two phases - Phase 1 (construction of the new building and procurement/installation of the equipment; Period of construction work: 12 months) and Phase 2 (remodel of the existing new building and construction of the new building; period: 12 months)

As of December 1992, the Kanti Children's Hospital had a staff of 296. After the completion of this project, the hospital's total floor area will be increased by about 1.71 times, from 8,857.00m^2 to 15,148.12m^2 (including a 988.00m^2 space to be added by the Nepalese side).

Basically, the hospital's operations for the new facilities can be managed by the existing staff. It is expected, however, that the number of outpatients will increase by more than 2.2 times by the year 2000. For this reason, it will be necessary to newly recruit a total of 17 staff members, including 3 doctors and 14 nurses.

Additional personnel expenses necessary for the planned increase in personnel will be covered with increased hospital incomes that will result from increases in the number of outpatients and increase in the number of paying beds.

While the hospital's annual operational cost at the time of completion of the project is estimated at 24,030,000Rs, its annual income for the same year is estimated to be 24,935,600Rs. It will be possible to cover development and other expenses with the difference of 905,600Rs.

In drafting the facility/equipment plan, special emphasis was placed on the need to avoid unnecessary increases in the cost of operation of the

hospital's facilities through such measures as the preferential use of locally procurable materials, reduction in heating and lighting expenses by the use of natural lighting and ventilation and the minimal cost of procurement of medical equipment with minimum requirement of the consumables and reagent (making up for the deficiency and replacing superannuated pieces of equipment). Thus, there will be no problem with the system of operating budget and the maintenance and operation of the hospital's facilities and equipment after the completion of this project.

It is expected that the implementation of this project will bring about the following positive effects and improvements:

1) With the expansion of the emergency department and the outpatient department, it will be possible to accept 450 outpatients (including ORT outpatients) and 150 emergency patients a day on the average. Thus, the daily number of outpatients will increase by 2.25 times from 200 in 1991~92, and that of emergency patients by 1.88 times from 80 in 1991~92. The increase in the number of hospital beds from 156 to 203 will make it possible to hospitalize up to 8,000 patients (except for NICU and PICU) a year. As a result, it will become possible to meet a large part of the demand for health care at the Kanti Children's Hospital, which is rapidly increasing with the improvement and expansion of the transportation network in Nepal. And a considerable improvement in the hospital's medical services for residents of the city of Kathmandu can be seen.

2) Since the Kanti Children's Hospital forms an important part of the country's highest-level referral system, which has the Bir National Hospital at its core, as a central children's hospital, the improvement in this hospital's functions will lead to an improvement

in the national system of acceptance of referral patients. This means that the implementation of this project will greatly contribute to the health and welfare of the country's children who account for more than 40 percent of the country's population, as well as their families. Thus, this project is expected to have positive effects nationwide.

3) The teaching hospital attached to the medical school of Tribhuvan University, which is the country's only institution for training medical professionals, does not have a pediatric department. The medical school's practical training in pediatrics is being carried out at the Kanti Children's Hospital. Thus, the improvement in this hospital's functions will contribute to the nurturing of medical professionals specializing in pediatrics.

Since this project aims to improve the medical services for children, the beneficialities of this project will be the entire people in Nepal and thus the effects of this project will greatly contribute to upgrading the welfare of the people.

It is expected that the Ministry of Health and the Kanti Children's Hospital will employ the necessary number of staff to cope with increases in demand for medical services up to the year 2000, secure necessary funds for the operation of the hospital and thereby enhance this project's long-term positive effects.

CONTENTS

CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

Facilities of the Kanti Children's Hospital, which is the country's only children's hospital and which is also serving as a teaching hospital specializing in pediatrics, are small and superannuated. Furthermore, as a result of repeated extension and remodeling, its facilities have expanded in a very inefficient way, making it difficult for the hospital to cope with the recent rapid increase in the number of outpatients or to function satisfactorily as a teaching hospital. To resolve such problems, the government of the Kingdom of Nepal drew up a project for the Expansion of the Kanti Children's Hospital, and in August 1992 made a request to the government of Japan for grant aid assistance for the project. In response to the request, the government of Japan decided to conduct a survey on this project, and the Japan International Cooperation Agency sent a preliminary study team headed by Dr. Makiko Kinoshita, Department of International Cooperation, National Medical Center Hospital, the Ministry of Health and Welfare to Nepal from September 20 to October 5, 1992 to confirm the background and objective of the project, as well as the present condition of the hospital, by discussing them with representatives of the government of the Kingdom of Nepal. The preliminary study team concluded that it was necessary to conduct a basic design study to establish the feasibility of grant aid assistance for the project.

The Japan International Cooperation Agency, therefore, sent a basic design study team, also headed by Dr. Makiko Kinoshita, to Nepal from December 6, 1992 to January 6, 1993. The basic design study team conducted the following surveys to establish the feasibility of grant aid assistance for

the project, on the basis of the results of the above-mentioned preliminary study:

(1) Survey of the present condition of the existing facilities of the Kanti Children's Hospital

(2) Survey of the present condition of related medical facilities

(3) Discussions about the method of operating and managing the facilities and equipment of the Kanti Children's Hospital

(4) Examination of the necessity of the requested facilities and items of equipment

(5) Confirmation of the project implementing system, the staffing plan, the budget for the operation and management of the facilities and equipment, the hospital's annual income and the scope of work to be carried out by the Nepalese side

(6) Survey of the project site and infrastructure in and around the project site

(7) Survey of the present condition of the local construction industry and available construction machines and materials

Back in Japan, the basic design study team analyzed the results of the above-mentioned surveys, and prepared a draft basic design study report based on the results of the analysis. In March 1993, the basic design study team discussed the contents of the draft report with the Nepalese side, and both sides reached agreement on the draft report. This report is designed to give an overview of the results of the above-mentioned surveys. A list of the members of the basic design study team, the time schedules of the surveys, a list of the representatives of the government of the Kingdom of Nepal interviewed and the minutes of the discussions are attached at the end of this report.

CHAPTER 2 BACKGROUND OF THE PROJECT

CHAPTER 2 BACKGROUND OF THE PROJECT

2-1 General Condition of Health Care in the Kingdom of Nepal

2-1-1 General Condition of Health Care

The Kingdom of Nepal is faced with many problems in the field of health care. According to the 1991 census, the country had a population of 18,462,081 of which 52 percent were aged 18 or younger. This means that there is a strong need to expand health care service and health education for the benefit of the country's infants and youths. Due to the country's special geographic conditions (Nepal is a mountainous country), more than 90 percent of the country's population are engaged in agriculture or occupations closely related to agriculture, scattered across the country. Nearly 50 percent of the country's population live far away from roads. All this make it very difficult to provide health care services nationwide and also make the cost of health care very high. Therefore, it is very difficult to expand health care services in rural areas.

In addition, the improvement of environmental sanitation is also one of the greatest challenges facing the country. Since the quality of groundwater is poor almost everywhere in the country, it is imperative to expand the country's water supply system (as of 1989~90, the system was available to only 23 percent of the population) and improve the unsanitary living environment.

The birth rate and the mortality rate are both high -- 39.6/1000 and 14.8/1000 respectively. And the average life expectancy is very short -- just 53. It should be noted that while males' average life expectancy is longer than females' -- 55.0 and 52.6 respectively.

Generally, the female's workload is about 25 percent greater than for

male's in rural areas. In addition, 22 percent of females get married under the age of 13, and 50 percent under the age of 16. Young mother's childbirth and child care are responsible for the relatively short life expectancy for females.

2-1-2 General Condition of Health Care for Children

In the Kingdom of Nepal, the population of children under the age of 14 was estimated at 7,936,509 as of 1990, which accounted for about 42 percent of the country's total population. The morbidity rate and the mortality rate are especially high for children under the age of five. It is said that nearly 70 percent of children under the age of 6 who live in rural areas are suffering from malnutrition. Also, there is a high incidence of diarrhea, making this disease one of the main causes of death. Of every 1,000 new-born infants, seven die within a day after birth, 16 within seven days, and 30 within one month. Of every 1,000 new-born infants, as many as 107 die within one year after birth.

In the field of health care for children, the government of the Kingdom of Nepal launched its first development plan aimed at meeting the Basic Human Needs (BHN), namely enhancing the quality of health, education and public peace, as well as that of food, clothing and shelter, through planned economic development, in 1956~57. Since then, the central government has been implementing health care policy measures laying utmost emphasis on primary health care. Policy measures in the field of health care for children, therefore, have been implemented as part of those for promoting primary health care. In Nepal, health care for children started with the addition of a pediatric department to Bir Hospital in 1957. And it became full fledged in 1970 when Kanti Children's Hospital was established with funds from the former Soviet Union. Kanti Children's Hospital was

restructured to serve as the country's sole children's hospital (with 50 beds).

The central government has since continued to expand the facilities of the children's hospital. In 1983, an ICU equipped with an incubator and three baby cots, all of which were donated under a project by the Japan Overseas Cooperation Volunteers, was installed in the hospital, and in 1984, the hospital's facilities were expanded and as a result had 150 beds including six ICU, with the assistance of the German Nepal Help Association. In the same year, the hospital's medical equipment was improved under a project to improve the medical equipment of Kanti Children's Hospital, which was implemented under Japanese grant aid. Now the hospital is providing medical services for children as the country's only children's hospital.

2-1-3 Disease Pattern

At the time of preparation of this report, the government of the Kingdom of Nepal was in the process of compiling data on the disease pattern in the country. Table 2-1, therefore, shows the main diseases and deaths from these diseases in 1984~85. Since the disease pattern at that time has not been changed from 10 years earlier, it can be said that the present disease pattern is almost the same as in 1984~85. Main diseases in Nepal are classified by cause into: ① infectious diseases, ② infectious diseases common to humans and domestic animals, ③ tropical diseases, ④ malnutrition, ⑤ dyspnea, ⑥ occupational diseases attributable to hard labor in agricultural and mountain villages, and ⑦ other unknown diseases.

If diseases related to delivery and those which it is impossible to diagnose are excluded from the 20 main diseases, infectious diseases,

disease of the digestive system, injuries, bone fracture are the most common, and bacterially caused diseases, mental diseases and tuberculosis have very high mortality rates. Infectious diseases include malaria, filaria, rabies, tuberculosis, leprosy and bacterially caused gastrointestinal diseases. Cases of goiter due to iodine deficiency are found nationwide. In recent years, influenza has been rampant in mountainous areas. The rate of death from influenza is very high for elderly people and children.

Table 2-1 Morbidity & Mortality Statistics in Nepal 1984/95

	Type of Disease	A No. of case	B No. of mortality	Mortality rate B/A×100
1	Normal delivery	18,698	19	0.1%
2	Intestinal infection disease	8,052	254	3.2%
3	Other diseases of the respiratory system	6,678	355	3.5%
4	Symptoms, signs and Ill defined condition	5,439	184	3.4%
5	Direct obstetric causes	4,747	53	1.1%
6	Disease of the other parts of the digestive system	3,653	138	3.8%
7	Tuberculosis	2,696	195	7.2%
8	Abortion	2,307	5	-
9	Diseases of female genital organ	2,069	3	-
10	Injuries	1,978	68	3.4%
11	Disease of the nervous system	1,637	161	9.8%
12	Disease of the urinary system	1,502	32	2.1%
13	Disorder of eye and adenexa	1,395	4	-
14	Fractures	1,290	18	1.4%
15	Diseases of the skin & subcutaneous tissue	1,064	20	1.9%
16	Disease of the blood and blood forming organs	870	43	4.9%
17	Viral disease	833	45	5.4%
18	Bacterial diseases	822	152	18.5%
19	Disease of the upper respiratory system	808	22	2.7%
20	Burns	784	37	4.7%
	Other	5,957	266	-
	Total	73,279	2,074	2.8%

Source: Country Health Profile NEPAL 1988

2-2 Present Condition of Health Care

2-2-1 Health Care System in the Kingdom of Nepal

In the Kingdom of Nepal, the health care system consists of primary health care services offered by health posts and medical services offered by hospitals. In the field of primary health care, a plan was drafted to improve the national network of health care services for the purpose of meeting the people's BHN, and in 1950 the construction of health centers was started. A health center is operated by one medical officer and other staff members capable of providing of basic medical services. Although there was a total of 31 health centers as of 1950, there has been no significant increase in the number of health centers because of a shortage of qualified medical professionals.

In light of such a situation, the above-mentioned plan was replaced with health posts to be operated mainly by paramedical staffs, "Health assistant" (HAs) or "Senior Auxiliary Health Workers" (SAHWs).

In 1986/87, the number of health posts was increased to 816. As of 1991, however, that number remained almost unchanged. The number of health centers has been reduced to 18 and the other former health centers are now serving as "district hospitals" (standard no. of beds: 15). Of these health posts, 675 are comprehensive health posts (ILAKAs), where such services as maternal and child health care, vaccination, guidance on nutrition, health education and prevention of epidemics are offered, in addition to treatment of common diseases.

The remaining 141 health posts ("static health posts") are providing basic medical examination/treatment services. In recent years, sub health posts to provide medical services to residents of remote places as branch

offices of the health posts have been added. There were also 145 traditional medicine pharmacies as of 1990-91.

In the field of medical services by hospitals, the establishment of Bir Hospital in 1949 marked the start of efforts to make preparations for the building of a full-scale hospital medical service system. In 1954, when the Ministry of Health was established, there were only 34 hospitals in total and the total number of hospital beds was 625. Since then, however, the country's hospital medical service system has been expanded with the cooperation of many foreign countries and international organizations/ missions. Twenty years later, in 1974-75 the total number of hospitals became 62 and the total number of hospital beds became 2,174. And more to that in 1990-91, there was a total of 111 hospitals including private hospital and the total number of hospital beds increased to 4,768 (the number of hospital beds per 10,000 population increased from 1.7 in 1974 to 2.6 in 1989-91), but still Nepal lags behind the other seven Southwest Asian countries in terms of the number of hospital beds per 10,000 population.

As shown in Fig. 2-1, Nepal's hospital medical service network is based on an organizational structure centered around Bir Hospital, in which specialized hospitals serve as central referral hospitals. Then, there are Regional hospitals in five Economic Development Regions, zonal hospitals in 14 zones and District hospitals in 75 District. And the total of the hospital is 75 with 2,804 hospital beds.

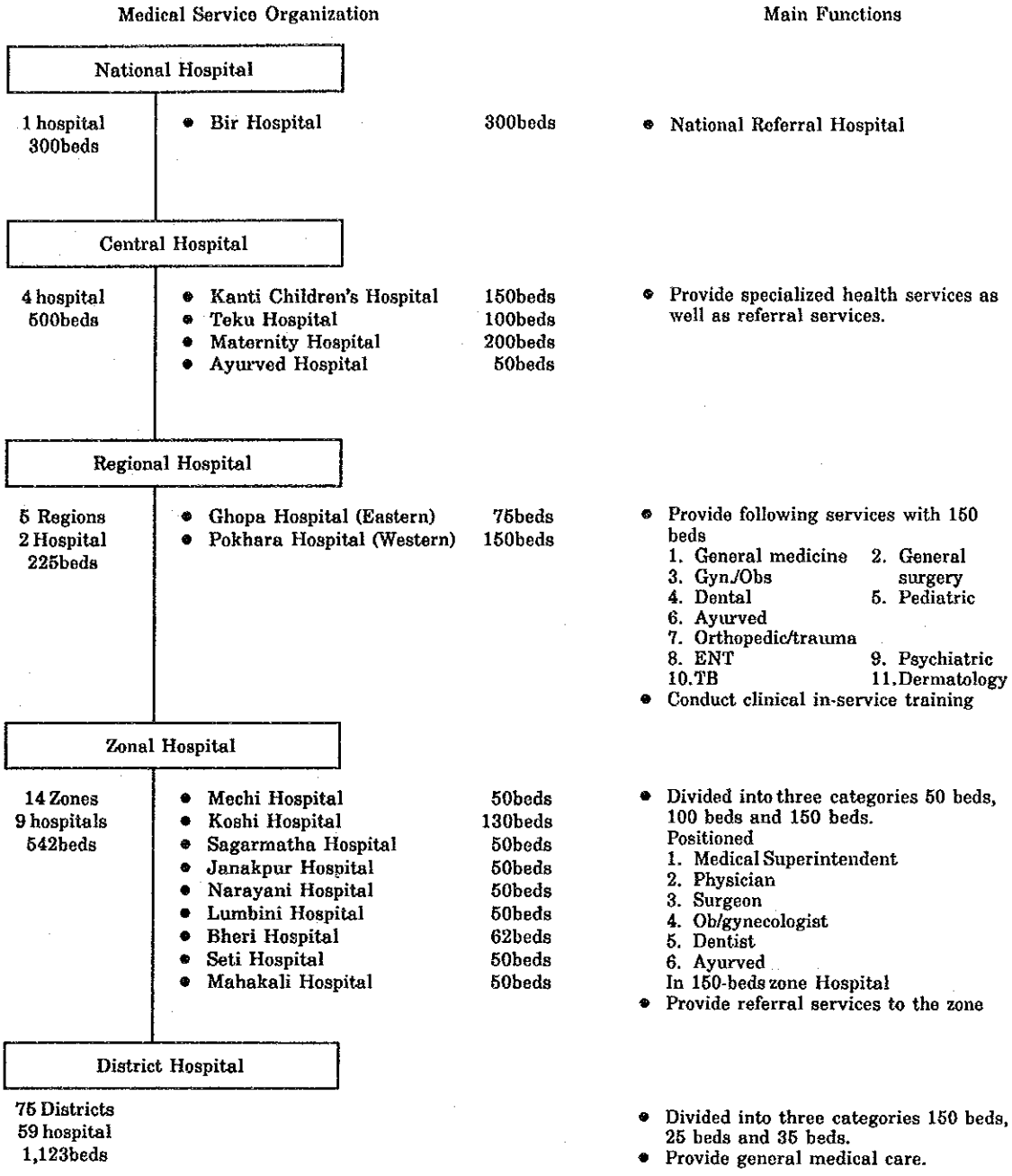

Fig. 2-1 Medical Service Organization under MOH

Table 2-2 shows the total number of medical staff as of 1991-92. While the number of doctors increased by about 1.76 times from 678 in 1982-83, the number of nurses (the total of bachelor nurses and nurses) increased to 627 by only about 1.24 times from 506. Most of these nurses are taken up by hospitals due to a serious shortage of nurses. And the number of "Auxiliary Nurse Midwives" (ANMs) who should work at health posts

increased by only about 1.55 times during the same period. Meanwhile, the number of hospital beds increased by about 1.56 times form 3,058 in 1982-83 to 4,768 in 1991-92.

Thus, the continuing shortage of nursing staff is a serious problem in the field of hospital medical service.

Table 2-2 Health Service Personnel in Nepal 1991/92

Doctor	Nurse (BN)	Nurse	ANM	Lab. Technician	Radio-grapher	Dentist	Physio-therapist	Baidya	Ayurved Asst.
1,196	89	538	2,400	126	59	23	8	130	240

(Source: MOH)

2-2-2 Health Care Administration

In the Kingdom of Nepal, the health care administration is carried out under the direction of the Ministry of Health. Fig. 2-2 shows the work flow of the health care administration in the country. At present, Bir Hospital is serving as the national referral hospital and four speciality hospitals, including Kanti Children's Hospital, are defined as the country's central hospitals.

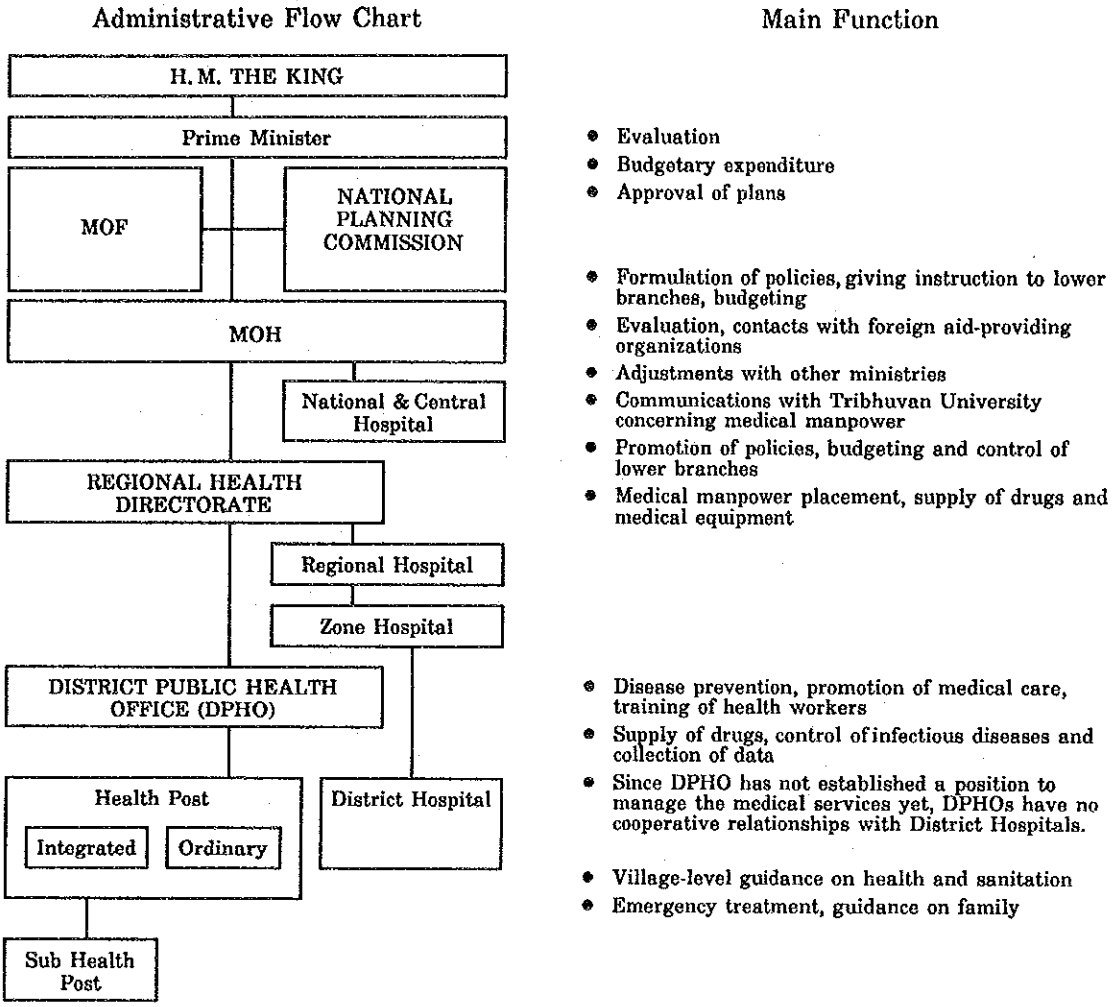

Fig. 2-2 Health Service Administration Chart

2-2-3 Medical Personnel Training System

In the Kingdom of Nepal, the training of medical personnel is carried out at Tribhuvan University, Institute of Medicine for the purpose of securing the necessary number of medical personnel to offer medical services under the Ministry of Health's long-term health care plan and the five-year plans drafted and implemented on the basis of the health care plan. The Institute of Medicine is operating under the control of the Ministry of Education. Since the Institute is responsible for the training of from paramedical to medical students taking postgraduate courses, it offers a

total of 24 courses in 8 curricula -- Auxiliary Nurse Midwife (ANM), Community Medicine Auxiliary (CMA), Certificate in Medical Science (CMs), Traditional Medicine, Nursing Certificate, Bachelor of Nursing, Bachelor of Medicine/Bachelor of Surgery, and Postgraduate Medicine.

Tribhuvan University, Institute of Medicine has a teaching hospital attached to it, but the teaching hospital does not have a pediatric department. For this reason, pediatric training is carried out at Kanti Children's Hospital.

Fig. 2-3 gives an outline of the country's medical personnel who have more than 3 years of practical experience after finishing the Certificate in Medical Science (CMS) courses are qualified for the undergraduate course and those who have more than 3 years of practical experience after finishing the Auxiliary Nurse Midwife (ANM) course and who obtains the School Leaving Certificate (SLC) are qualified for Nursing Certificate.

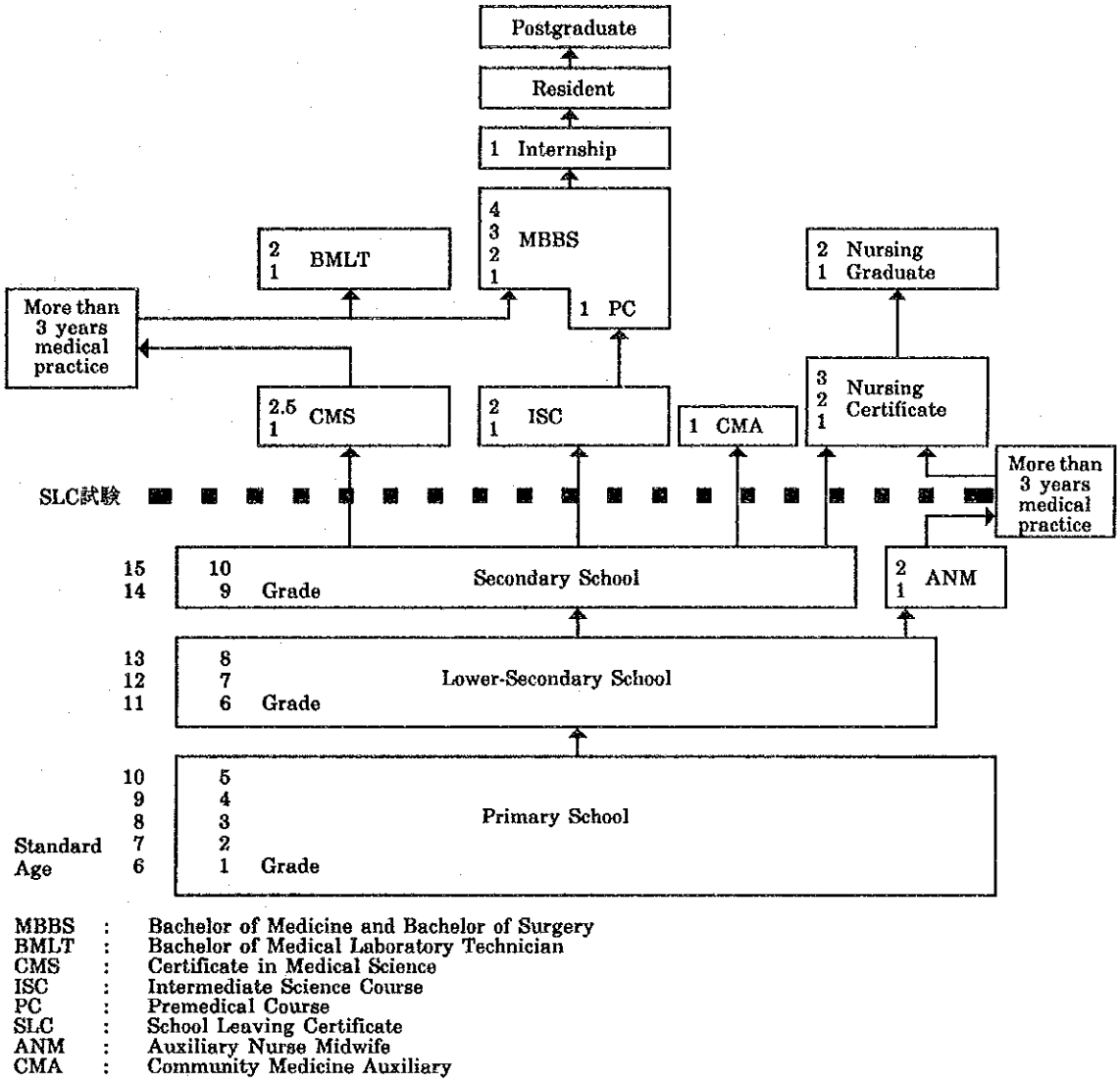

Fig. 2-3 Conceptual Scheme of Medical System in Nepal

2-2-4 Medical Service Referral and Medical Education System

In the Kingdom of Nepal, as stated earlier, health care is under the jurisdiction of the Ministry of Health, and the training of medical personnel is under the jurisdiction of the Ministry of Education. While Tribhuvan University, Institute of Medicine has a pediatric department, the teaching hospital attached to it does not have pediatric department. For this reason, Kanti Children's Hospital, which is operating under the

control of the Ministry of Health and which is located adjacent to the Institute is serving as the training hospital.

In the health care referral system, on the other hand, Bir Hospital, which is serving as the national referral hospital, and six other hospitals -- Kanti Children's Hospital, Tribhuvan University Teaching Hospital, Maternity Hospital, Teku Infectious Disease Hospital, Ayurved (Traditional Medicine) Hospital and Patan Hospital -- are the highest- level referral hospitals. Fig. 2-4 below gives an outline of the medical service referral system.

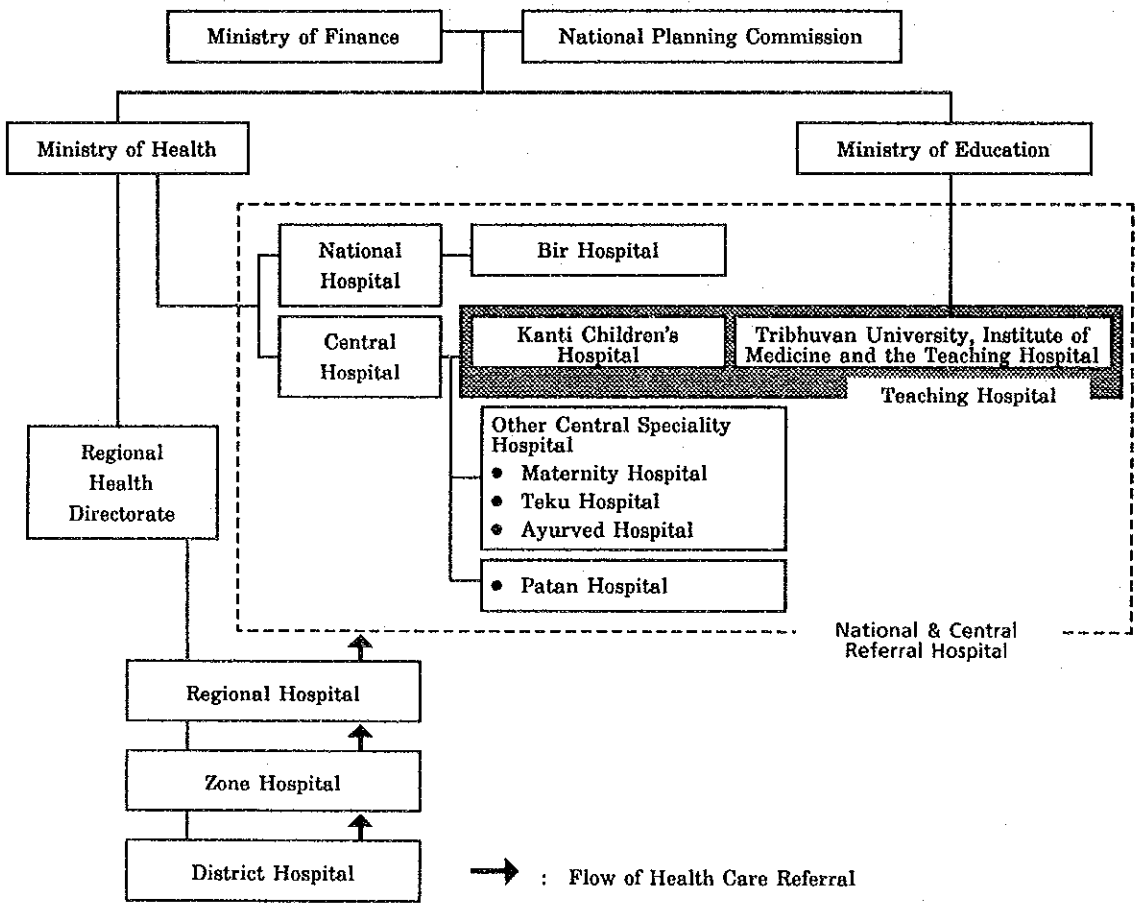

Fig. 2-4 Medical Service Referral and Medical Education System

2-2-5 Outline of Health Care-Related Development Plans

In 1956-57 the government of the Kingdom of Nepal started the first five-year plan which was aimed at enhancing the quality of health, education and public peace in addition to securing BHN, namely, food, clothing and shelter, through planned economic development. The central government's policy measures in the field of health care were centered on primary health care, and as part of these policy measures, health posts to be operated by "health assistants" (who have finished a 2.5-year medical course after graduating from high school) were established in various parts of the country. In 1975, the Ministry of Health formulated "the Long Term Health plan 1975-90." The long-term health plan served as the main guideline for the ministry's health care policy measures taken under the 5th five-year plan (1975-80), the 6th five-year plan (1980-85) and the 7th five-year plan (1985-90).

(1) The 8th Five-Year Plan (1992-97)

As a result of the democratization movement in 1989, a review was made of the past development plans, and in 1992 the 8th five-year plan was started. The current five-year plan is aimed at improving the quality of national life by resolving such national problems as the economic slowdown, poverty, deficiencies in the country's social structure, environmental disruption and the high rate of growth of population. In the fields of health care, the 8th five-year plan follows the lines of the 7th five-year plan, namely, to attain the goal of "Health for All by the Year 2000." The 11 concrete policy measures to attain the goal are:

1. Under the Family Planning and Mother and Child Welfare Programme, 1,246,800 couples will be provided temporary and permanent family planning services. This will increase the contraceptive prevalence rate (CPR) from the existing 23 percent to 32 percent. Targets have

also been set to provide health services to 1,668,210 pregnant and lactating mothers and 1,434,605 children.

2. In order to reduce the mortality rate of children, 3,139,232 children will be vaccinated (D.P.T., polio and B.C.G.) against six child killer diseases under the Expanded Programme for Immunization. Mortality due to diarrhea and acute respiratory infection will be reduced. Nutrition programmes will be expanded to improve the nutritional status.

3. To control malaria, insecticides will be sprayed in the malarial areas inhabited by 600,000 to 800,000 people. Insecticides will also be sprayed in areas affected by encephalitis and kalazar.

4. Programmes to control tuberculosis and leprosy will be expanded.

5. Primary health centres with three bed facility will be set up in 100 electoral constituencies and 3,199 health sub-posts will be established in Village Development Committees.

6. During the plan period, 300 beds will be added in the Bir Hospital to develop it as a central hospital. 150 beds will be added to Kanti Children's Hospital, 100 beds to the Infectious Diseases Hospital, 50 beds to the Mental Hospital and 250 beds to the Maternity Hospital. In order to develop regional hospitals, necessary arrangements will be made to convert existing hospitals in the mid-western development region and the far-western development region to regional hospitals. In line with the policy of increasing the number of beds at zonal hospitals, 25 beds will be added to Janakpur Hospital, and 10 each at Baglung and Jumla hospitals. According to the policy of establishing 15 bed hospitals in every district, hospital services will be provided in the remaining 10 districts. Besides, 100 beds will be added to the Ayurved hospital and 10 to the Homeopathy hospital. A 10 bed AIDS hospital will also be established in Kathmandu.

With the establishment of new hospitals and the expansion of existing ones, a minimum of 1,165 hospital beds will be added during the Eighth Plan period. Additional hospital beds will be provided with the establishment of the B.P. Memorial Institution of Medical Science in Dharan and the proposed B.P. Memorial Cancer Hospital as well as other health institutions to be established in the private and NGO sectors.

7. To provide effective curative health services, health laboratories facilities, epidemiological services and regular drug supply will be ensured. In addition, environmental health programmes and programmes to control goiter, cretinism, sexually transmitted diseases and AIDS will be implemented.

8. During the Eighth Plan period, provisions will be made for training centres and medical colleges to produce the necessary high, medium and basic level personnel for the development of health services. In addition, female health volunteers will be trained in basic health care at health posts, while middle-level training will be provided at various training centres.

9. The Naradevi Ayurvedic Hospital, the Singha Durbar Baidyakhana and district ayurvedic clinics will be strengthened. Special efforts will be made to raise the quality of ayurvedic health services.

10. Different programme to improve health management systems will be implemented for the effective implementation of the programmes of health services.

11. The B.P. Memorial Institute of Medical Sciences will be established during the plan period. The private sector will also be encouraged to set up new medical colleges.

(2) The National Health Policy of His Majesty's Government of Nepal 1991

In 1991 the Ministry of Health made public "the National Health Policy of His Majesty's Government of Nepal 1991," which was to replace the ministry's "Long Term Health Plan" in light of the need to formulate a new policy to improve the country's health care system. In it, the Ministry of Health pointed out the following as the main problems to be dealt with in the field of health care:

1. The central government's health policy, goals and policy measures are not satisfactorily oriented toward the welfare of village residents, and as a result, few policy measures to meet the needs of residents of rural areas have been implemented.

2. The central government has lacked the ability to fully implement its health care programs.

3. The central government has not always managed, monitored or assessed its health care programs.

4. The central government's resources in the field of health care have been concentrated in urban areas.

5. There has been a shortage of government officials to work at health care organizations in rural area.

The new policy, which was drawn up in light of these problems, is aimed at providing opportunities for residents of rural areas to gain easy access to basic primary health care services by expanding the scope of these services to include rural areas and providing them with direct access to modern medical facilities. The ministry has formulated specific guidelines and program implementation schedules for each of its divisions/departments concerned.

2-2-6 The Ministry of Health's Expenditures and Financial Aid from Foreign Countries/International Organizations

(1) The Ministry of Health's Expenditures

The central government's expenditures for fiscal 1991-92 amounted to 29,084.5 million rupees, of which 1,215 million rupees, or about 4.2 percent, went to health care. Of the expenditures for health for fiscal 1991-92, 61.0 percent was appropriated for development. Almost every year the central government's expenditures have far exceeded its revenues, the differential being covered by funds from foreign donor countries and borrowings at home and abroad. Funds from foreign donor countries represent about 50 percent of the central government's development budget.

Table 2-3 Expenditures of National Budget & Ministry Health Budget

(Rs in Million)

		1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
Ministry of Health	Regular Expenditure	150.0	182.5	204.1	251.1	296.6	293.8	473.7
	Development Expenditure	255.9	309.2	385.2	616.0	393.8	366.8	741.4
	Total	405.9	491.7	589.3	867.1	690.4	660.6	1,215.1
	Foreign Aids & Loan	137.5	148.4	139.7	288.8	129.6	105.4	113.8
Nepal	Regular Expenditure	3,583.9	4,135.1	4,677.0	5,676.2	6,671.8	7,570.3	7,489.2
	Development Expenditure	6,213.3	7,378.0	9,428.0	12,328.7	12,997.5	15,979.5	21,595.3
	Total	9,797.1	11,513.2	14,105.0	18,004.9	19,669.3	23,549.8	29,084.5
	Foreign Aids & Loan	3,491.6	3,990.9	5,269.3	5,666.9	6,446.1	5,990.0	11,906.8*

* First 5 months figures

(Source: Economic Survey 1992)

(2) Financial Aid from Foreign Countries

During the three year period of 1988-89 to 1990-91, the World Health Organization (WHO) ranked first in terms of the amount of funds provided to Nepal among foreign countries and international organizations, accounting for 17.91 percent of the total amount of funds provided by them over the three-year period. WHO was followed by UNICEF (8.87 percent),

Switzerland/UNDP/Japan (5.71 percent), UNFPA (4.48 percent) and USAID (3.94 percent). Table 2-4 shows trends in funds from foreign countries/ international organizations. Since 1985-86, the government of Japan has implemented such grant aid programs as the project to improve the medical equipment of Kanti Children's Hospital (1985, ¥280 million), the project to construct the National Tuberculosis Center (1987, ¥1.43 billion) and the project to expand the facilities of the hospital attached to Tribhuvan University, Institute of Medicine (1991, ¥1.442 billion; 1992, ¥109 million) in Nepal.

Table 2-4 External Resources Budget 1985/86~1988/89

(Unit: 1,000Rs)

Health Development Programme	1985/86	1986/87	1987/88	1988/89	Supporting Agencies
1. EPI	9,591	25,617	44,859	42,053	UNICEF
2. Nursing Improvement	388	411	600	1,831	UNICEF, NORWAY
3. Tuberculosis Control	540	540	20,391	12,000	WHO, JAPAN
4. Malaria Control	503	26,760	40,580	2,310	WHO, USAID
5. Health Post Construction	200	335	1,800	–	NLRA, USAID
6. Environmental Health	179	345	374	237	UNICEF
7. Goiter and Cretinism Control	7,629	7,880	9,451	10,000	UNICEF
8. Health Planning Improvement	988	1,743	1,210	–	USAID
9. Public Health	37,616	37,367	22,354	15,365	USAID, UNICEF, WHO, NLRA
10. Integrated Rural Development	6,905	4,841	2,788	812	STA, ADB
11. Dept. of Drug Administration	319	462	448	462	UNICEF
12. FP/MCH	51,096	40,247	32,016	38,769	USAID, UNFPA
13. Health Laboratory	2,300	2,200	2,460	1,480	UNICEF, WHO
14. Leprocy Control	6,185	8,236	9,316	5,554	NLRA, INF
15. Indent Procurement/Supply	2,200	1,032	540	–	USAID
16. Nutrition	6,816	8,943	11,280	9,047	UNICEF, WHO
17. Health Education	345	528	195	200	UNICEF, WHO
18. Goiter Control	8,640	16,500	24,864	23,316	INDIA
19. Medical Research Committee	75	150	40	40	WHO
20. HELLTS	950	21	40	187	WHO
21. Hospital	22,675	2,400	31,580	35,000	JAPAN, NETHERLANDS, USAID, WHO
22. Regional Medical Stores	20,725	–	–	–	USAID
23. Blindness Control	7,263	–	–	–	WHO
24. Training Centres	–	2,300	2,300	2,300	NETHERLANDS
25. Medical Stores	75	–	–	–	
26. Zoonotic Control	–	861	–	–	
27. ARI	–	55	–	–	USAID
28. Diarrhoeal Disease	–	1,762	–	–	UNICEF
29. CDD	–	2,274	–	11,410	USAID
Total	194,205	193,310	259,506	212,915	

(Source: Fiscal Year Source Book, MOF)

2-3 General Condition of Kanti Children's Hospital

2-3-1 Organization and Operation/Management of the Hospital

(1) Organization

Fig. 2-5 illustrates the recently revised organization of Kanti Children's Hospital.

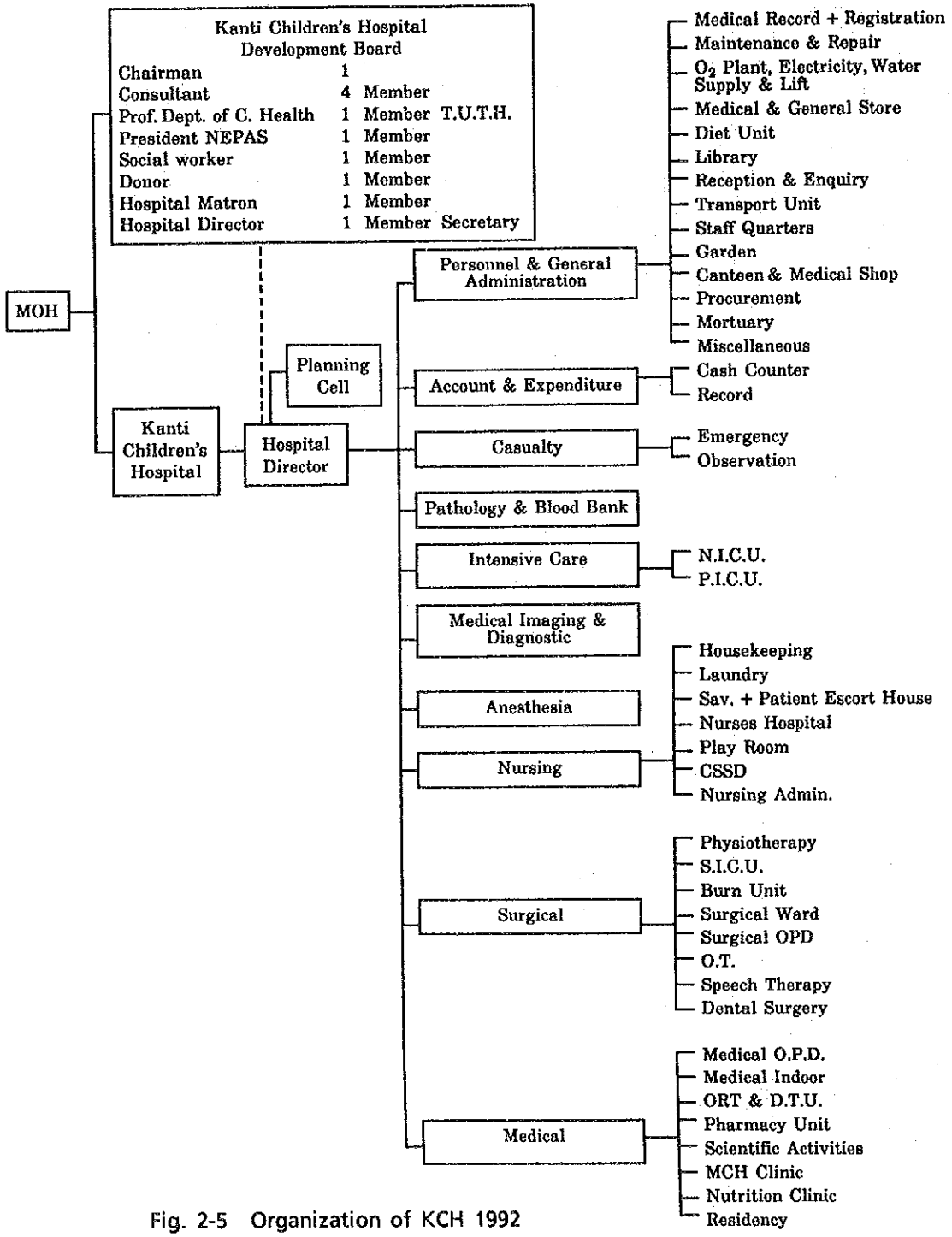

Fig. 2-5 Organization of KCH 1992

(2) Operation and Management of the Hospital

Kanti Children's Hospital is operating under the control of the Ministry of Health, but it is granted substantial autonomy. The K.C.H. Development Board, which was established as the organization to support the operation of the hospital, is playing an important role in securing the hospital financial resources through hospital incomes and the board's fund and employing contract workers. The board has the following functions and consists of 11 members, including qualified businessmen, a representative of Tribhuvan University, Institute of Medicine and the chairman of the Nepal Pediatric Society. Decisions on all matters except for those relating to the ordinary operation and management of the hospital, which are under the authority of the director of the hospital, are made by the board and are implemented by the director of the hospital.

- Functions of the K.C.H. Development Board

1. Policy formulations for the overall divisions of the hospital.
2. To manage to provide better specialized service to the patients.
3. To create various technical and administrative posts and appoint staff on contract basis by its own financial source.
4. To make effort for international assistance.
5. To conduct child health training with close collaboration of institute of medicine and request to His Majesty's Government of Nepal to provide scholarship for training in various subspecialities.
6. To work as useful partner of valley group of hospitals.

7. To function as valley group of teaching hospital and undertake various post-graduate activities as desired by post graduate medical committee under His Majesty's Government, Ministry of Health.

(3) Operating Cost

Revenues of Kanti Children's Hospital consist of contribution from the central government, hospital income and other incomes (donations and the like). Contribution from the central government are divided into regular expenditure, including the staff member's salaries, and development expenditure, which are used for the construction of buildings. The balance of the contribution, which it is not necessary to return to the central government, is included in the development board's fund. Regarding the development expenditure, however, the hospital must report to the Minister of Health on the progress of the development project for which the development expenditure have been appropriated. Table 2-5 shows trends in the amount of the annual revenues of Kanti Children's Hospital over the past five years.

Table 2-5 Revenue of KCH

(Unit: Rs 1,000)

	'87/88	'88/89	'89/90	'90/91	'91/92
Contribution	13,000	14,960	11,100	14,400	14,675
Regular		4,460	4,000	4,400	4,000
Development		10,500	7,100	10,000	10,675
Hospital charge	1,189	1,598	1,262	1,579	2,173
Other	473	309	328	1,733	735
total	14,662	16,867	12,690	17,712	17,583

(Source: KCH)

On the other hand, "salary" and "other" expenditure item account for a large part of the hospital's expenditures -- about 36 percent and 39

percent respectively in fiscal 1991-92. Trends in the hospital's expenditures over the past five years are as shown in Table 2-6. As can be seen from the table, the hospital's annual budget was in the red only in fiscal 1987-88. The hospital's annual budget resulted in a surplus of 5,525,000 rupees in fiscal 1986-87. Thus it can be said that the hospital has a well balanced budget.

Table 2-6 Expenditures of KCH

(Unit: Rs 1,000)

	'87/88	'88/89	'89/90	'90/91	'91/92
Salary	3,179	4,351	4,730	5,905	6,339
Electricity	202	296	390	436	760
Fuel	169	175	142	277	345
Water	27	45	50	75	78
Medical Supplies	1,158	1,284	1,591	1,469	1,745
Medical Equipment	144	267	500	1,502	128
Personnel	199	290	316	445	613
Facility Maintenance	89	143	58	57	119
Equipment Maintenance	132	428	174	171	357
Other	9,929	7,638	4,092	5,833	6,761
Total	15,228	14,917	12,043	16,170	17,245
Balance	▲566	+1,950	+647	+1,542	+338

(Source: KCH)

2-3-2 Numbers of Hospital Beds and Staff Members

(1) Hospital Beds

As of December 1991, Kanti Children's Hospital had a staff of 296 and 156 hospital beds. Table 2-7 shows a breakdown of the total number of beds installed in the hospital. In the medical ward, there was a total of 94 beds -- 31 pay beds, 59 free beds and 4 beds in the ORT examination room. In the ward for patients receiving surgical treatment, there was a total

of 42 beds -- 16 beds in the general sickrooms, 8 beds in the preoperation room, 7 beds in the postoperation room, 6 beds in the orthopedic surgery room, 4 beds in SICU and 1 bed in the single sickroom. All the other beds except single room are free beds.

Table 2-7 Number of Bed in KCH

Dec. 1992

		Ward	Number of Room	Number of Bed	Total
Medical Total 94 Beds	Pay bed	Cabin 4 Beds 6 Beds	3 1 4	3 4 24	31 Beds
	Free bed	6 Beds 7 Beds 8 Beds	1 3 4	6 21 32	59 Beds
	ORT	–	1	4	4 Beds
Surgical Total 42 Beds	Pay & Free Bed	Cabin 8 Beds	1 2	1 16	17 Beds
	Pre. Ope.	6 Beds	1	8	19 Beds
	Post. Ope.	7 Beds	1	7	
	SICU	4 Beds	1	4	
	Orthopedic	6 Beds	1	6	6 Beds
ICU	NICU PICU	4 Beds 5 Beds	2 1	8 5	13 Beds
Emergency	Observation	3 Beds 4 Beds	1 1	3 4	7 Beds
Total					156 Beds

In recent years, there has been a marked increase in the number of inpatients at the hospital. During the rainy season, many patients visit the hospital, knockdown beds are installed in the corridors of the wards and temporary ward (in the form of a tent) for patients to receive ORT treatment.

(2) Staff Members

Of the total number of staff members of 296, 202 are engaged in medical care. Table 2-8 shows a breakdown by function of the total number of

staff members. There are 32 doctors -- 7 consultants (medical department: 5, pediatric surgery: 1, anesthesia: 1), 2 anesthetists, 2 dentists, 16 medical officers, 1 consultant radiologist, and 1 Sr. HA and 6 AHWs. The nursing staff, on the other hand, consists of 80 nurses -- 1 matron, 5 sisters, 60 staff nurses, 4 ANMs, 15 nurse aids and 47 ward ordinaries.

Table 2-8 KCH Manpower

Dec. 1992

	Medical personnel						Administrative Personnel			Total
	Doctor	Asst. Doctor	Nurse	Asst. Nurse	Tech.	Other	Office	Tech.	Service	
Director	(1)	–	–	–	–	–	1	–	–	1+(1)
Administration	–	–	–	–	–	–	21	–	15	36
Maintenance	–	–	–	–	–	–	–	11	4	15
Account	–	–	–	–	–	–	6	–	–	6
Emergency	1	–	–	–	–	–	–	–	–	1
Pathology	1	–	–	–	14	–	–	–	–	15
ICU	3	–	–	–	–	–	–	–	–	3
Diagnosis	1	–	–	–	3	1	–	–	–	5
Anesthesia	3	–	–	–	–	–	–	–	–	3
Nursing	–	–	80	15	–	47	1	–	35	179
Surgical	6	3	–	–	4	–	–	–	–	13
Dental	2	–	–	–	–	–	–	–	–	2
Medical	15	3	–	–	–	–	–	–	–	18
Total	32	6	80	15	21	48	29	11	54	296

Note: (1) in Director column is currently Consultant

(3) Future Staffing Plan

The Government of Nepal plans to increase the total number of beds at Kanti Children's Hospital to 300 under the 8th five-year plan. In parallel with this plan, the total number of the hospital's staff members will be increased to 981, as shown in Table 2-9.

Table 2-9 Future Manpower Plan of KCH, 300 Bed

	Medical Personnel						Administrative Personnel			Total
	Doctor	Asst. Dr.	Nurse	Asst. Nurse	Tech.	Other	Office	Tech.	Service	
Director	2	–	–	–	–	–	5	–	–	7
Administrator	–	–	–	–	–	–	48	–	27	75
Maintenance	–	–	–	–	–	–	–	23	23	46
Account	–	–	–	–	–	–	15	–	–	15
Emergency	25	–	–	–	–	–	–	–	–	25
Pathology	4	–	–	–	32	10	–	–	–	46
ICU	19	–	–	–	–	–	–	–	–	19
Diagnosis	6	–	–	–	20	3	–	–	–	29
Anesthesia	10	–	–	–	–	–	–	–	–	10
Nursing	–	–	263	25	–	143	15	2	121	569
Surgical	41	9	–	–	6	–	–	–	–	56
Dental	2	–	–	–	–	–	–	–	–	2
Medical	66	13	–	–	3	–	–	–	–	82
Total	175	22	263	25	61	156	83	25	171	981

2-3-3 Present Condition of the Hospital's Operations

(1) Health Care and Related Operations

The functions of Kanti Children's Hospital are divided into ① outpatient, ② emergency, ③ inpatient, ④ intensive care, ⑤ operating/central supplies, ⑥ medical imaging & diagnosis, ⑦ pathology/blood bank, ⑧ pharmacy and ⑨ nutrition unit. In addition, the Expanded Programme on Immunization (EPI), which is operated under the direct control of the Ministry of Health, is incorporated into the hospital's functions.

1) Outpatient Department

The outpatient department is divided into medical outpatient, ORT, surgical outpatient and dental outpatient departments. Consultation is conducted from 9:00 to 14:00. Outpatients are received at the general reception counter and then receive consultation at the medical, ORT, surgical or dental section. The medical section is subdivided into the first visit section (8 doctors) and the follow up section (3 doctors). The department's nursing staff consists of a nurse and 5 nurse aids (NA). The ORT department, which forms a part of the medical department, has four beds for patients suffering from diarrhea. One to three nurses are taking care of these patients in addition to caring for those in general sickbeds. The department's doctor stands by within the hospital.

The surgical department has 2 full-time doctors. The department has 9 nurses, who work also for the medical department, and 3 nurse aids. The department has a physiotherapy room, where physiotherapy and speech therapy (which was started in 1990) are conducted by 2 physiotherapists and a speech therapist. In 1991-92, the number of outpatients undergoing physiotherapy was 697, which was small compared with the total number of inpatients for the same year. In contrast, the number of outpatients undergoing speech therapy is on the rise. The total number of patients undergoing speech therapy increased sharply from 336 (331 outpatients and 25 inpatients) in 1990-91 to 1,215 (1,096 outpatients and 119 inpatients) in 1991-92.

The dental department has 2 dentists, but only one dental unit is usable. It has a nursing staff of two. The outpatient's pharmacy is dispensing only free medicines. As shown in Table 2-10, the number of outpatients has increased by 1.58 times over the past five years. The rate of increase has been phenomenal since 1989-90.

Table 2-10 Outpatient 1987/88~1991/92

	1987~88	1988~89	1989~90	1990~91	1991~92	'87/'88~'91/'92
Medical vs. previous year	29,920	30,137 +0.75%	31,566 +4.74%	39,817 +26.14%	44,499 +11.76%	1.49 times –
ORT vs. previous year	1,050	1,284 +22.29%	2,841 +121.26%	3,835 +34.99%	5,762 +50.25%	5.49 times –
Surgical vs. previous year	3,108	3,608 +16.09%	4,228 +17.18%	4,696 +11.07%	4,914 +4.64%	1.58 times –
Dental vs. previous year	2,516	1,561 ▲37.96%	2,110 +35.17%	2,518 +19.34%	2,542 +0.95%	1.01 times –
Total vs. previous year	36,594 –	36,590 ±0%	40,745 +11.36%	50,866 +24.84%	57,717 +13.47%	1.58 times –

Table 2-11 Physiotherapy Patient 1987/88~1991/92

	1987~88	1988~89	1989~90	1990~91	1991~92	'87/'88~'91/'92
Outpatient	392	456	558	341	697	1.78 times
Inpatient	3,370	3,710	3,730	3,872	4,150	1.21 times
Total	3,762	4,116	4,288	4,213	4,847	1.29 times

Table 2-12 shows trends in the seasonal variation in the number of outpatients. In the case of the surgical and dental departments, the number of outpatients varied little from one month to another (in the busiest month about 1.6 times as many outpatients as in the least busy month visited the departments). In the case of the medical department, on the other hand, the number of outpatients was the largest in April and the smallest in November. In April about 2.7 times as many outpatients as in November visited the department. In the case of the ORT department, as many as 2,000 outpatients were registered in July when the number of outpatients was the largest. That number was more than 13 times larger than that for the least busy month. For this reason, knockdown frame beds are installed in the ward for patients suffering from diarrhea. In addition, during the

rainy season when so many outpatients visit the department, a tent is installed in the front garden.

Table 2-12 Outpatient Seasonal Variation 1991/92

	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
medical	5,624	5,241	5,585	4,611	4,467	3,705	2,256	2,090	2,240	2,348	2,942	3,434
ORT	352	413	900	2,000	312	150	185	501	178	150	275	315
surgical	340	401	425	415	410	380	400	298	568	453	416	408
Dental	284	226	243	236	182	166	170	174	251	222	169	239
Total	6,580	6,271	7,103	7,262	5,371	4,431	3,014	3,063	3,243	3,173	3,802	394

: Busiest month : least busy month

2) Emergency Department

This department has only one pediatrician. In actuality, medical officers (specializing in medical or surgery) are working around the clock and getting an assistance from doctors who stand by at other department as the need arises. The nursing staff consists of a senior sister, 5 staff nurses, 5 ANMs and 2 NAs, all of whom are working in three shifts. Over the past five years, the number of outpatients visiting this department has increased by 2.81 times, which rate of growth is higher than 1.49 times for the outpatient medical department and 1.58 times for the outpatient surgical department.

Table 2-13 Emergency Nursing Staff

Nursing Unit	No. of Beds	Sister	Staff Nurse	ANM	NA	Total
Emergency	7 (Recovery Bed)	1	5	5	2	13

Table 2-14 Number of Emergency Patient 1987/88~1991/92

	1987~88	1988~89	1989~90	1990~91	1991~92	'87/'88~'91/'92
No. of Patient vs. previous year	10,200 –	11,885 +16.52%	20,433 +71.92%	25,956 +27.03%	28,702 +10.59%	2.81 times –

3) Inpatient Department

The inpatient department has a total of 136 beds (except those in NICU and PICU). The nursing function is divided into 5 nursing units -- pay medical, free medical, ORT, surgical and SICU/postoperation ward units. Table 2-15 and 2-16 show the nurse's work pattern and a breakdown of the total number of nurses at the department respectively.

Table 2-15 Work Pattern of Nursing Staffs

	Hospital Hour		
Nursing Staff	Day	Evening	Night
Matron	9:00~15:00	–	–
Sister	8:00~14:00	14:00~20:00	–
Sr. Staff Nurse	8:00~14:00	14:00~20:00	–
Staff Nurse Nurse Nurse Aid	8:00~14:00	14:00~20:00	20:00~8:00

Table 2-16 Distribution of Nursing Staffs

Nursing unit	No. of Bed	Sister	Staff Nurse	ANM	NA	NA
Pay Medical Ward	31	1	5	1		7
Free Medical Ward	59	1	7	6	2	16
ORT	4		1*+5			6
Surgical Ward	31	1	3	3	1	8
SICU · Post Operation	4+7		5			5
Total	136	3	26	10	3	42

*: Sr. Staff Nurse

Since 1987-88, the number of medical inpatients undergoing treatment at the department has remained almost unchanged. Although the number of inpatients undergoing surgical treatment has increased by 1.81 times over the past five years, the total number of inpatients has increased by only 11 percent during the same period -- a very low rate of growth compared with that for the total number of outpatients

during the same period. Given that the average length of hospitalization per patient is 8.24 days at this hospital and that the inpatient division has a total of 136 beds, the maximum annual number of inpatients is approximately 6,024 (136 beds × 365 days/bed ÷ 8.24 days/patient). Except for 1990-91, however, the actual annual number of these inpatients has always exceeded the above average number. Ancillary beds and plywood boards have been used in addition to the existing beds to cope with such a situation. It seems that the low rate of growth in the total number of inpatients has been attributable to the shortage of beds.

Table 2-17 Inpatient of Medical and Surgical Wards 1987/88~1991/92

	1987~88	1988~89	1989~90	1990~91	1991~92	91~92/87~88
Medical Inpatient (exclude NICU,PICU)	5,484	5,513	5,409	4,689	5,643	1.03 times
Surgical Inpatient (include SICU)	639	684	930	1,045	1,155	1.81 times
Total	6,123	6,197	6,339	5,739	6,798	1.11 times

4) Intensive Care (NICU/PICU) Department

The intensive care department consists of NICU and PICU and has a staff of one doctor specializing in the care of new-born infants and 2 medical officers. The nursing organization consists of NICU and PICU nursing units. Table 2-18 gives an outline of this department's nursing staff.

Table 2-18 Medical Staffs at ICU

Nursing Unit	No. of Bed	Sister	Staff Nurse	ANM	NA	Total
NICU	8	1	10	–	2	13
PICU	5	1	6	1	–	8

Except for the NAs, the NICU staff consists of 3 nurses on the day shift, 2 nurses on the evening shift, 2 nurses on the night shift and 3 nurses on leave. On the other hand, the PICU nursing staff consists of 2 to 3 nurses on the day shift, a nurse on the evening shift and 1 to 2 nurses on leave. Table 2-19 shows trends in the number of inpatients receiving treatment at this department. In the case of the NICU, the number ranges from 200 to 260. The sharp decrease in the number during 1990-91 was attributable to the NICU's closure for about seven months from August 1990, which was caused by an accident. The 1991-92 figure for the PICU, which was established in July 1991, is for the period of 9 months till March 1992.

Table 2-19 Inpatient at ICU 1987/88~1991/92

	1987~88	1988~89	1989~90	1990~91	1991~92
NICU	261	243	223	84	202
PICU	-	-	-	-	136

Table 2-20 shows monthly changes in the number of NICU inpatients. In 1992, the number of inpatients was the largest in December (24). That number was about twice as large as the smallest number (11) recorded in October. Of the annual total number of inpatients (197) who received treatment at the NICU in 1992, 65, or 32.99 percent, died while in hospital. On the other hand, of the annual total number of inpatients (168) who received treatment at the PICU in the same year, 71, or 42.26 percent, died while in hospital.

Table 2-20 Inpatient and Death at NICU 1992

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Inpatient	16	15	15	17	18	18	19	16	13	11	15	24	197
Death	6	6	2	1	6	9	11	7	5	3	6	3	65

5) Operating/Central Supply Department

This department has three operating rooms, of which two are usable. The other operating room is in the process of being remodeled into an emergency operating room. The operating staff consists of a pediatrician, 4 surgeons (medical officers), a Sr. HA and 3 AHWs. Since a vacancy caused by a consultant's retirement is scheduled to be filled, the total number of pediatricians will be two. The department's nurses are also working at the central supply room. Table 2-21 gives an outline of this department's staffing.

Table 2-21 Medical Staffs in Operating/Central Supply Department

Department	No. of Bed	Sister	Staff Nurse	ANM	NA	Total
Operating	2 Recovery				4	4
CSSD			1		3	4

Over the past five years, the annual number of operations performed at this department has increased by 1.49 times. Table 2-22 shows changes in the annual number of operations over the past five years. A breakdown by type of disease of the total number of operations during 1991 shows that the most common disease was hernia (160), followed by cheilognathopalotoschisis (125), bladder stone (90), polyp of rectum (80), phimosis (75), imperforate anus (70), burn (58), abscess (56), cystoma (50) and intestinal obstruction (50).

Table 2-22 Number of Operation

Operation	1987~88	1988~89	1989~90	1990~91	1991~92	Average operation hour
Abdominal	302	303	353	456	475	2~4 hours
Urogenital	164	127	134	194	223	2~3 hours
Hydrocephalus Shunt	11	17	15	24	31	1~2 hours
Head or Neck	120	96	89	162	152	2 hours
Thoracic Neonatal	33	23	32	55	69	2 hours
Skin Bone	230	187	197	221	244	1 hour
Neonatal G. I. Disorders	7	5	7	14	29	2 hours
Total vs. previous year	867 –	758 ▲8.74%	827 +9.10%	1,126 +36.15%	1,223 +8.61%	

The annual total operating hours for 1991-92 were 2,773 hours (calculated on the basis of the figures in Table 2-22). As shown in Table 2-23, there was a wide seasonal variation in the number of operations during that year, the largest number (147) being recorded in September and the smallest number (47) in April (the largest number being more than 3 times the smallest).

Table 2-23 Monthly Operation 1992

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
No. of operation	118	127	100	47	92	122	122	119	147	77	93	113	1,277

6) Medical Imaging and Diagnosis Department

This department's main operations include X-ray diagnosis, ultrasonic diagnosis and E.C.G. diagnosis. The department has two X-ray diagnosis equipment, of which one is unusable. Its other equipment include two ultrasonic diagnosis equipment and a spirometer. It has a staff of a radiologist, two radiographers and a darkroom technician. Table 2-24 gives an outline of X-ray diagnosis conducted at this

department over the past five years. The number of general X-ray diagnoses conducted at the division has increased by 1.87 times over the past four years, which rate of growth is higher than that for the number of outpatients. A sharp decline in the number of X-ray diagnosis other than those for general diagnosis after 1990-91 is attributable to the breakdown of an X-ray diagnosis machine.

Table 2-24 X-ray and Other Diagnosis 1988~'89~1991~'92

Diagnosis	1988~89	1989~90	1990~91	1991~92	'88/'89~'91/'92
X-ray General	14,334	16,467	21,537	26,823	1.87 times
Upper Gastrointestinal Tracts	150	300	35	16	–
Barium Enema	300	–	16	38	–
Gallbladder	25	7	12	6	–
I.V.P., MCU	25	42	40	37	–
Ultrasonography	264	413	565	752	2.85 times
Echocardiography	98	168	235	335	3.42 times
E.C.G.	70	110	100	160	2.29 times

(Source: Medical Imaging and Diagnostic Dept., K.C.H.)

7) Pathology/Blood Bank Department

Bacteriological, parasitological, blood and biochemical tests are conducted at the Pathology laboratory. The laboratory has a staff of 15 -- a pathologist, a medical lab. technologist, a technologist, eight technicians and four lab. assistants -- of which two are responsible for the operation and management of the blood bank. Table 2-25 shows changes in the number of tests conducted at this department over the past five years.

Table 2-25 Laboratory Tests 1987/'88~1991/'92

Laboratory	1987~88	1988~89	1989~90	1990~91	1991~92	'91/'92~88/'89
Bacteriology Lab.	3,160	4,200	5,058	5,777	6,698	2.12 times
Parasitology Lab.	19,300	22,930	26,570	31,353	33,535	1.74 times
Hematology Lab.	6,200	8,500	11,580	13,290	16,200	2.61 times
Clinical Chemistry Lab.	540	608	920	1,030	1,564	2.90 times

(Source: Pathology & Blood Bank Dept., K.C.H.)

At the blood bank, blood (one pack: 300mℓ) is collected from 60 to 70 donors a month on the average. Donor are mainly patient's families and friends. When there is a shortage of blood, the laboratory receives a special supply of blood from the Central Blood Bank.

8) Pharmacy

Drugs are purchased in bulk from Royal Drugs & Sajha and are stored in the drug warehouse, from where they are supplied to the wards, outpatient, emergency and other departments in quantities required. In principle, drugs are dispensed free of charge to outpatients and inpatients receiving treatment in the free inpatient ward. Even expensive drugs and those for use in emergency treatment are dispensed free of charge to those patients who are not earning incomes large enough to pay for such drugs, if the consultant in charge issues a written statement requesting free dispensing. The emergency department is permitted to keep a stock of drugs for use in emergency treatment. Drugs such as those dispensed to patients in the pay ward, which are not dispensed free of charge, are purchased by patients who need such drugs. These drugs are sold at a private pharmacy operating within the hospital as a tenant.

9) Nutrition Guidance

This department opens a nutrition guidance clinic for patients referred from the outpatient department once a week. Ten to 12 first visit patients and 30 to 50 revisit patients are referred to this department a week. A total of 893 patients have been referred to this department over the past five years. In addition, the department offers guidance on special diets to inpatients who need to be on a restricted diet and patients suffering from malnutrition.

Table 2-26 Nutrition Guidance 1987/'88~1991/'92

	1987/88	1988/89	1989/90	1990/91	1991/92	'87/88~'91/92
No. of Nutrition Guidance	102	191	187	181	232	2.27 times

(2) Training in Pediatrics

Since the hospital attached to Tribhuvan University, Institute of Medicine, which is the country's only institution of education and training of medical personnel, does not have pediatric department, the training of the medical school's students in pediatrics is carried out at Kanti Children's Hospital. Curricula and courses presently offered at the hospital are a pediatric course at the postgraduate level, a pediatric nursing course at the undergraduate level, a pediatric nursing course at the Nursing Certificate level and a pediatric course at the Certificate in Medical Science level. Over the past five years, 66 doctors, 220 nurses and 176 HAs have received pediatric training at the hospital.

Table 2-27 Medical Training at KCH

	1988	1989	1990	1991	1992	5 year total
Doctor	12	15	18	21	--	66
Nurse	35	50	73	55	7	220
HA	0	34	37	50	55	176
Total	47	99	128	126	62	462

(3) Other Activities

1) Provision of Meals

At present, meals are provided only to patients in free beds and those who need to be on a restricted diet. Since the hospital's kitchen is closed, a private restaurant operating within the hospital as a tenant is commissioned to supply meals to these patients. However, special meals for patients suffering from malnutrition are provided by the hospital. The kitchen, which is now closed, was leased to an outside meal supplier before, but as a result of a dispute over the quality of meals provided by the supplier, the meal supply contract was terminated. The hospital has plans to have pay meals for patients and staff members and free meals for patients in free beds supplied by the kitchen.

2) Laundry

Due to the lack of adequate washing facilities, only napkins, pillowcases, aprons and the like are washed within the hospital. Bed sheets and other large articles are washed by a contract laundry. At present, 4,000 to 6,000 articles are washed a month, a breakdown of which is shown in Table 2-28.

Table 2-28 Monthly Laundry

	Items	Quantity (piece)
Contract	Bed sheet	1800~2700
	Blanket	200~300
	Sofa cover	20~30
Hospital	Draw sheet	160~250
	Pillow case	160~250
	Towel	620~860
	Screen clothes	40~60
	Gown	620~860
	Apron	300~460
	Other	80~130

(Source: KCH)

3) Clinical Records

Every first visit outpatient is registered at the general reception counter, and the number of the total issuance of new registration cards and a total amount of payments are recorded daily. Income from hospital fee is examined every day in collaboration with the staff member in charge of accounting. At the wards, records of both patients who have just been hospitalized and those who are going to leave the hospital are collected every morning, and inpatients' case records are put in order according to the number written on the records. These items of clinical information are sorted out and kept at the medical record room. Necessary items of information are transferred from the original records, edited and then distributed to the Ministry of Health and other related organizations, as well as in the hospital.

4) Housekeeping

Staff members in charge of housekeeping examine the cleanliness of linen goods and other materials used at the wards, keep records of the incoming and outgoing of linen goods and washed items, and repair them

under the supervision of the nursing department. They are also responsible for supervising the cleaning of the hospital's facilities (except for those of the wards and outpatients) and the premises of the hospital. Ward attendants, sweepers and gardeners are working under the supervision of housekeeping staff members.

5) Maintenance and Management

The hospital has a maintenance and management staff of 15 -- a civil engineer, an electrical engineer, an electronics engineer, an automobile engineer, five technical supervisors (one each in the fields of civil engineering, electrical engineering and electronics, and two in the field of automobile engineering), two maintenance and repair engineers, a plumber, a painter, and a mechanic.

The hospital's facility maintenance cost and equipment maintenance cost for 1991-92 were 119,000 rupees and 357,000 rupees respectively, a breakdown of which is as shown below.

A. Facility maintenance cost	119,000 Rs
1. Lift	45,000 Rs
2. Vehicles	48,000 Rs
3. Furniture	17,000 Rs
4. Plumbing, etc.	9,000 Rs

B. Equipment maintenance cost	357,000 Rs
1. Oxygen generating plant	40,000 Rs
2. Incubators	25,000 Rs
3. X-ray diagnosis devices	5,000 Rs
4. Anesthetization equipment	60,000 Rs
5. Inhalers	5,000 Rs
6. Phototherapy equipment	10,000 Rs
7. Freezers	10,000 Rs
8. Copying machines	15,000 Rs
9. Air conditioners	20,000 Rs
10. Generators	10,000 Rs
11. Microscope accessories	5,000 Rs
12. Autoclaves	20,000 Rs
13. Examination equipment parts	132,000 Rs

2-3-4 Medical Examination/Treatment System

(1) Medical Examination/Treatment System

Outpatients fill out the Patients Card at the general reception counter, pay the registration fee, and then go to the emergency or outpatient department. At the outpatients department, they undergo screening, and then go to the medical, surgical, dental or ORT. Fig. 2-6 illustrates the hospital's medical examination/treatment system.

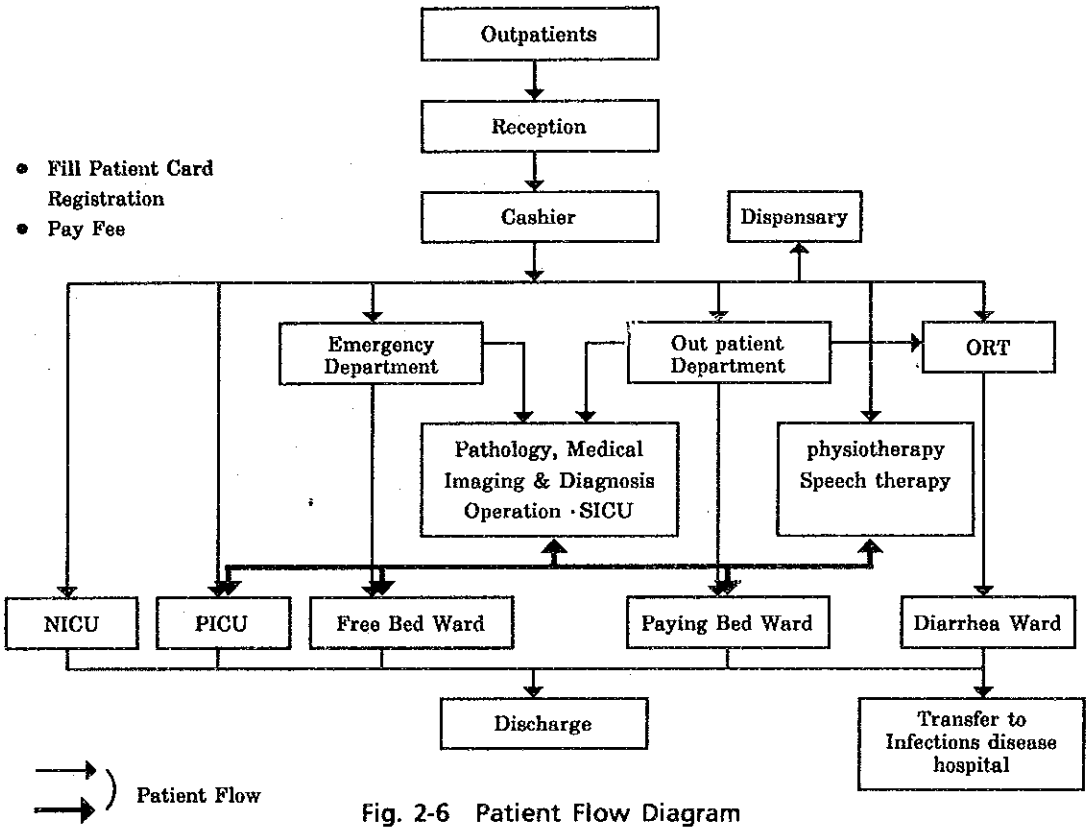

Fig. 2-6 Patient Flow Diagram

(2) Hospital Charge

Outpatients receive medical examination/treatment after paying three rupees for the issuance of the registration card or five rupees for the emergency registration card.

The hospital registration charge needs to be paid by all patients, except these patients who are judged, by doctors, to be incapable of paying. Medical service fees are itemized in detail and patients must pay the fees before receiving medical services.

However, medical services for serious or emergency cases will be provided before paying medical fees and reduction or exemption of fees is available to those patients who are judged to be in capable of paying medical services fees. The medical ward is divided into a pay ward and a free ward. The pay ward's hospital charges are 100 rupees/bed/day for a single room, 50 rupees/bed/day for a four-bed room and 40 rupees/ bed/day for a six-bed room. On the other hand, the surgical ward has only one pay bed and all the other beds are available free of charge. In principle, patients receive medical examination/treatment at an ICU or at the dental department must pay medical service fees. However, reduction or exemption of medical service fees is available to those patients whom the consultant in charge judges to be incapable of paying the medical service fee in full. Patients undergoing X-ray/ultrasonic diagnosis, a clinical examination, an operation, physical therapy or speech therapy, except for those at the free ward, must pay for the medical service.

While meals are provided free of charge to patients in free beds, other patients take meals at their own expense. In the Kingdom of Nepal, medical services used to be offered free of charge and drugs were also used to be administered free of charge, with some exceptions. In recent years, however, there has been a growing tendency for hospitals to charge patients for medical service and drug administration. In the case of Kanti Children's Hospital, too, the K.C.H. Development Board is considering measures to increase the hospital's income in order to secure funds necessary for resolving the problem of the shortage of medical

personnel, particularly nurses. It should be noted that the hospital's medical service fees were raised in October 1992.

2-3-5 Disease Pattern at Kanti Children's Hospital

Table 2-29 shows changes in the number of cases (inpatients), their deaths and their mortality rate over the past ten years.

The number of cases (inpatients) in Table 2-29 is based on their records sorted out and kept at the personnel/general affairs department. The records of outpatients and emergency patients are not available because they take their registration cards home. It can be said, however, that inpatient's records alone will be satisfactory in understanding the disease pattern at the hospital. During the past ten years, respiratory diseases, infectious diseases and burn/diseases requiring surgical treatment accounted for 70 to 80 percent of the total number of cases. While the percentage of infectious diseases decreased from 30.6 percent in 1983 to 11.42 percent in 1992, that of respiratory diseases increased from 38.10 to 48.9 percent during the ten-year period.

As shown in Table 2-30 "Operation Records", hernia, cheilognathopalatoschisis, bladder stone, polyp of rectum and phimosis are the most common diseases in the category of burns/surgical.

Table 2-29 KCH's Major Disease and Death '83~92

		'83	'84	'85	'86	'87	'88	'89	'90	'91	'92
1. Respiratory disease	case	1,304	1,385	1,680	1,704	1,620	1,671	2,016	2,588	2,656	3,600
	death	152	120	83	145	45	50	60	55	53	53
	rate	11.6%	8.6%	4.9%	8.5%	2.8%	2.9%	2.9%	2.1%	1.9%	1.4%
2. Infectious disease	case	1,050	774	987	840	469	515	576	585	630	840
	death	120	90	71	72	60	40	70	60	21	15
	rate	11.4%	11.6%	7.2%	8.5%	12.8%	7.8%	12.1%	10.3%	3.3%	1.8%
3. Tuberculosis	case	182	129	198	221	197	120	140	130	255	260
	death	22	12	20	24	5	15	25	20	15	3
	rate	12.1%	9.3%	10.1%	10.9%	2.5%	12.5%	17.8%	15.4%	5.9%	1.1%
4. Bacterial disease	case	30	231	60	77	90	95	120	180	200	360
	death	12	28	30	34	20	22	30	35	44	22
	rate	40%	12.1%	50%	44%	22%	23%	25%	19.4%	22%	6.1%
5. nutritional disease	case	55	45	36	25	81	90	95	101	150	155
	death	16	3	7	11	2	2	1	4	3	3
	rate	29.1%	6.6%	19.4%	44%	2.5%	2.2%	1.1%	3.9%	2%	1.9%
6. Nervous system	case	330	105	172	209	195	200	208	190	205	240
	death	25	27	37	53	5	9	8	9	2	5
	rate	7.5%	25.7%	21.5%	25.4%	2.6%	4.5%	3.8%	4.7%	0.9%	2.1%
7. Genital urinal disease	case	31	30	20	115	84	70	90	95	99	120
	death	7	5	3	2	1	1	3	2	4	3
	rate	22.6%	16.7%	15%	1.7%	1.2%	1.4%	3.3%	2.1%	4%	2.5%
8. Heart disease	case	13	20	32	35	51	40	51	40	45	72
	death	2	6	5	8	5	3	2	2	3	2
	rate	15.4%	30%	15.6%	22.8%	9.8%	7.5%	3.9%	5%	6.3%	2.7%
9. Blood disease	case	43	30	45	29	84	90	101	90	66	72
	death	5	2	12	9	5	4	15	5	3	5
	rate	11.6%	6.7%	26.6%	31%	5.9%	4.4%	14.8%	5.5%	4.5%	6.9%
10. Burn & Surgical	case	365	365	447	618	223	645	800	741	961	1,150
	death	7	18	25	24	15	12	10	19	30	20
	rate	1.9%	4.9%	5.6%	3.9%	6.7%	1.8%	1.2%	2.5%	3.1%	1.7%
11. Jaundice	case	17	21	40	48	39	55	45	32	75	85
	death	4	6	5	7	4	2	5	2	7	2
	rate	23.5%	28.6%	12.5%	14.6%	10.3%	3.6%	11.1%	6.2%	9.3%	2.3%
12. Poisoning	case	10	12	24	–	12	10	15	8	20	13
	death	1	2	4	–	–	2	1	3	3	2
	rate	10%	16.7%	16.7%	–	–	20%	6.7%	37.5%	15%	15.3%
13. Symptoms, Signs & ill- defined condition	case	–	15	20	80	80	75	91	104	190	240
	death	–	5	3	25	6	8	10	12	10	10
	rate	–	33.3%	15%	31.2%	7.5%	10.6	10.9	11.5%	5.2%	4.1%
14. Other	case	6	50	30	–	108	95	87	96	136	150
	death	2	33	13	–	20	5	4	9	20	8
	rate	33.3%	66%	43.3%	–	18.5%	5.2%	4.6%	9.3%	14.7%	5.3%
Total	case	3,436	3,212	3,791	4,001	3,333	3,771	4,435	4,981	5,688	7,357
	death	375	357	318	414	197	175	244	218	218	153
	rate	10.91 %	11.11 %	8.39%	10.35 %	5.79%	4.64%	5.50%	4.38%	3.83%	2.08%

(Source: KCH)

Table 2-30 Operation Record, 1987/89~1991/92

	1987/88	1988/89	1989/90	1990/91	1991/92
1. hernia	60	80	150	126	160
2. bladder stone	18	90	75	80	90
3. polyp of rectum	7	45	47	55	80
4. Cheilognathopalatoschisis	26	105	125	105	125
5. urethral calculus	10	50	40	30	40
6. cystoma		20	15	30	50
7. phimosis	4	30	35	50	75
8. gallstone	13	20	20	15	25
9. burn	4	30	35	75	58
10. imperforate anus	11	45	45	45	70
11. abscess	10	130	80	50	56
12. intestinal obstruction	5	55	25	30	50
13. hydrocephalus shunt	11	17	15	24	31
14. other myelomameningocele hirschsprung's diseases	688	385	406	408	313

While the number of inpatients has increased by 2.14 times over the past ten years, their mortality rate has decreased by about 80 percent, from 10.9 percent to 2.1 percent, during the same period. It is evident that medical services offered at Kanti Children's Hospital have been improved from year to year. The improvement has been phenomenal particularly since 1987. Main infectious diseases treated at the hospital are enteric fever, septicemia and diarrhea/dysentery, which account for more than 80 percent of the total cases of infectious disease. While the percentage of these infectious diseases has been decreasing almost every year, that of patients suffering from malnutrition has remained almost unchanged, which means that significant achievements are yet be made in the improvement of the country's health and socio-economic environments.

2-3-6 Present Condition of the Hospital's Facilities and Equipment

(1) Site

The site of Kanti Children's Hospital is located about 3km north of the centre of Kathmandu, just inside of the ring road in Maharajganji district of the city. It is about 50m away from an access road from Maharajganji Road, which is a main road running between the northern and southern parts of the city. The entire site, which is owned by Kanti Children's hospital, has a total area of about 45,000m^2. One part of the site has an area of 14,000m^2 which has existing hospital facilities. The other part of the site has an area of about 31,000m^2 which is purchased for future extension of the hospital facilities and surrounded by farmland. The ground level difference between these two parts is about 25m. The proposed project site is the part with the area of 14,000m^2 and located near the access road on east side.

The northern side of the site borders on a road approximately 3.6m wide. This road is expected to be widened, and therefore it is likely that the borderline between the road and the site will be moved southward by as much as 2.1m.

(2) Size of the Existing Facilities

The hospital's existing buildings have a total floor area of about 8,857m^2. The main building consists of an old building which was constructed in 1963 and a new building which is an extension of the old building after 1970 when Kanti Children's Hospital was established. Annexes to the main building, which include lodging houses, are scattered on the site. The sizes of these facilities are as follows:

- Existing building ..... 8,857m^2

Main building 5,480m²

Old building	1,292 m²
New building	4,188 m²

Annexes ..... 3,377 m²

Oxygen plant building	70 m²
EPI building	97 m²
Garage	85 m²
Workshop	140 m²
Housing for patients' families	391 m²
Housing for nurses	619 m²
Generator building	60 m²
Warehouse	375 m²
Mortuary	40 m²
Tenants' building	105 m²
Housing for doctors	480 m²
Housing for staff members	850 m²
Others	65 m²

At the time of the implementation of this basic design study, office rooms for the administration building, a toilet building for wards, VIP ward and a laundry room were under construction. All these new facilities, whose total floor space is 988m², are scheduled to be completed by the end of 1993.

- New facilities under construction 988m²

Office room 3rd floor of the administration building (to be completed in February 1993)	270 m²
Toilet building for the wards (to be completed in June 1993)	218m²
VIP ward (to be completed in May 1993)	311m²
Laundry room (to be completed in February 1993)	189m²

(3) Details of the Facilities

The old building, which was constructed in 1963, was first used as a general hospital with 50 beds, and then was remodeled into a children's hospital. At present, the building has a total of 150 beds. The hospital whose initial floor area was about 1,200m^2, has been extended many times. The hospital facility then became a building with a total floor area of 5,480m2, which is about 4.5 times as large as the initial building. However, its present floor area is still not large enough for the present scale of the hospital's operations. And furthermore, the floor plan for the existing facilities has proved to be inefficient due mainly to the fact that the existing facilities have been extended without any viable plan for the future. In addition, especially the old building, being constructed in 1963 are superannuated and also damaged by termites. The facilities as a whole now have poor architectural quality, and it is difficult to keep them clean.

It is difficult to keep the operating room and the CSSD clean. The pathology laboratory and the ICUs are insufficient in terms of airtightness, and therefore it is impossible to prevent dust from entering these facilities. It is also difficult to keep the room temperature at a required degree in these facilities. In the X-ray diagnosis room, protection against X-rays is insufficient and the situation inside is health hazard to people. Toilets for the use of patients are in extremely poor condition. So, an additional toilet building is now under construction. The sewage treatment facility not only has a limited capacity but also is not functioning well, with the result that sewage is discharged directly into the drainage ditch. It is necessary to take steps to resolve this problem.

The existing building with the limited floor area is a hindrance to the operation of facilities. It can be said that the existing facilities can no longer handle a workload of 57,717 outpatients a year, 28,702 emergency patients a year and 6,798 inpatients a year.

(4) Equipment

At present, the hospital is provided with minimal items of medical equipment, except for the X-ray diagnosis equipment. However, the hospital's present equipment maintenance and management system is not functioning well, therefore some items of equipment are not used fully. The hospital's materials and parts management system is also insufficient, some important materials and parts being left unattended in the warehouse. It is necessary therefore to improve its ability to maintain and repair the medical equipment.

1) Outpatient

5 medical examination table	3 sphygmomanometer
4 desks	1 refrigerator
2 automatic dryers	

2) Emergency

1 ambulance	1 sphygmomanometer
1 medical examination table	5 oxygen flowmeters
1 inhaler	1 lamp
2 stretchers	

3) Medical Imaging and Diagnosis

1 X-ray machine	1 plain X-ray machine
1 portable X-ray	2 ultrasonic diagnosis units
2 electrocardiographs	

4) Operating

1 operation lamp	4 portable operation lamps

2 electric scalpels	3 incubators
3 infant warmers	3 iv infusion pumps
3 operating tables	1 weighting machine
1 phototherapy unit	2 oxygen flowmeters
4 endoscopes	2 electrocardiogram monitors
1 defbrilater	1 boiling sterilizer
1 tonometer	1 blood pressure monitor
1 ultrasonic nebulizer	1 film wagon
2 anesthetization units	2 heat retainers
1 X-ray viewer	2 inhalers
2 low pressure inhalers	1 lamp
1 wheelchair	1 new-born infant's respirator
3 stretchers	

5) Central Supply

1 high pressure vapor sterilizer	1 desk-top vapor sterilizer
1 vertical vapor sterilizer	1 EIG gas sterilizer
1 tubular dryer	1 dry heat sterilizer

6) Intensive Care

8 incubator	7 infant warmers
3 new-born infant's respirators	6 IV infusion pumps
3 syringe pumps	1 blood gas chromatograph
1 electrocardiogram monitor	1 drug cooler
1 distillers	1 flame photometer
1 bilirubin meter	1 weighing machine
5 ICU beds	1 transdermal gas monitor
2 ultrasonic nebulizers	2 centrifuges
2 baby bottle	1 refrigerator

1 baby bottle heat retainer

7) Pathology Laboratory

2 centrifuges
1 fluorescent microscope
1 hemoglobin meter
1 ultrasonic pipette cleaner
3 biliburin meters
1 PH meter
1 autodilutor
2 incubators
1 hematocrit centrifuge
3 Constant-temperature water tank
3 automatic dryers
3 refrigerators
2 spectrophotometers
1 direct reading analytical balance
1 dry heat sterilizer
3 microscopes

8) Wards

12 inhalers
2 working tables
4 tonometers
2 film wagons

9) Other

1 washing machines
1 dryer
1 dehydrator
1 oxygen plant

2-4 Background and Outline of the Request

2-4-1 Background of the Request

The government of the Kingdom of Nepal intends to be able to offer basic health care services to all the people of the nation by the year 2000.

Since 1950, the government of the Kingdom of Nepal's policy in the field of health care has been implemented with utmost emphasis on the improvement and expansion of primary health care services. It has made strenuous efforts to establish health posts, health centres and other medical facilities. Due to financial difficulties and a shortage of medical personnel, however, it has not been able to meet the increasing public demand for health care.

The central government's policy in the field of child health care has been incorporated into the primary health care services, and therefore they were not fully implemented as part of the hospital health care services. Since its founding in 1970 as a children's hospital with 50 beds, however, Kanti Children's Hospital has expanded its operations on the basis of the K.C.H. Development Board's self-help effort and the support from foreign and domestic donors. At present, the hospital is a central hospital with 150 beds, and is also among the country's highest-level referral hospitals. The hospital is famed for its high level of medical care. Many patients are referred to the hospital not only from across the country but also from India.

However, the facilities of the hospital, which have repeatedly been extended since its founding, is small and superannuated. As such, they can no longer cope with the recent increase in the number of outpatients visiting it. The hospital is finding it increasingly difficult to function as the country's sole children's hospital. For this reason, the

government of the Kingdom of Nepal drew up a project to expand and improve the facilities of the hospital and made a request to the government of Japan for grant aid assistance for the implementation of the project.

In response, the government of Japan decided to conduct a survey on the request, and in September 1992 the Japan International Cooperation Agency sent a preliminary survey team to Nepal to verify the background and contents of the request. The preliminary survey team reached the conclusion that it was necessary to conduct a basic design study to establish the feasibility of grant aid for the project, and in December 1992 the Japan International Cooperation Agency dispatched a basic design study team to Nepal.

2-4-2 Outline of the Project

The Outline of the Nepalese request for grant aid assistance for the project as confirmed through the government of Nepal's written request and the results of the preliminary survey can be summarized as follows:

(1) Objective

To contribute to the improvement in the quality of Kanti Children's Hospital through the construction of its new facilities, the remodeling of its existing facilities and the provision of medical equipment for use in child health care.

(2) Project Site

Location of the project site: Maharajganj, Kathmandu

Area of the project site: Approximately 14,000m2

(3) Project Implementing Organization

Kanti Children's Hospital

(4) Contents of the Request

1) Facilities

A. New facilities

① Outpatient Department

② Inpatient Department

③ Operating Department

④ Central Supply Department (CSSD)

⑤ Intensive Care Unit Department (NICU, PICU, SICU)

⑥ Diagnosis/Pathology Laboratory Department

⑦ Emergency Department

B. Remodeling of the existing facilities

① Existing facilities of the outpatient department

② Existing facilities of the Pathology department

③ Existing facilities of the X-ray diagnosis department

④ Existing facilities of the intensive care unit department

C. Demolition of part of the existing buildings

2) Equipment

A. Equipment for use in medical examination/treatment

B. Equipment for use in education/training

C. Equipment for use in administration

3) Transportation and installation of the above-mentioned items of equipment

CHAPTER 3 CONTENTS OF THE PROJECT

CHAPTER 3 CONTENTS OF THE PROJECT

3-1 Objective of the Project

The high infant mortality rate is one of the most pressing problems facing the Kingdom of Nepal. Kanti Children's Hospital was founded in 1970 as the country's only children's hospital. It started with 50 beds, but the number of beds has since been increased. At present, the hospital has a total of 150 beds. In recent years, there has been marked increases in the number of patients visiting the hospital, and in addition, the hospital's operations have been improved both qualitatively and quantitatively as a result of the addition of a pediatric training hospital for the medical school of a national university. Despite these facts, however, the hospital is finding it increasingly difficult to perform its functions because of its superannuated facilities.

Under such circumstances, the government of Nepal drafted a project to expand and improve the facilities of Kanti Children's Hospital for the purposes of reducing the country's infant mortality rate, coping with the shortage of hospital beds by securing the necessary number of hospital beds. The project is also meant to strengthen the system for supporting local hospitals and other medical facilities, and to improve the quality of child health care in the country. The objective of this project is to construct the facilities and to procure equipment necessary for the implementation of the above-mentioned project and thereby contribute to the improvement of child health care service.

3-2 Examination of the Contents of the Request

3-2-1 Examination of the Appropriateness and Necessity of the Project

The main functions that the hospital is required to fulfill as the country's sole children's hospital are:

1) Main speciality hospital in child health care

2) Referral hospital for child health care services

3) Education and training of medical personnel to specialize in child health care

4) Primary health care service for children living in the metropolitan area

Because of its limited facilities, however, Kanti Children's Hospital is finding it difficult to meet the growing public demand for health care. Furthermore, parts of its facilities are superannuated. As a result of the repeated extension and remodeling, the hospital has a very inefficient traffic flow, which is preventing the hospital from offering efficient medical services. It is now imperative to integrate and streamline the hospital functions scattered around various parts of the site. Since it is expected that the number of patients to visit the hospital will increase due to the further increase in the population of the city of Kathmandu and the improvement in the means of transportation from rural areas to the hospital as a result of the improvement in the national network of roads, it is urgently necessary to improve the hospital's functions and thereby improve the quality of its medical services. The government of the Kingdom of Nepal is in the process of implementing a project to increase the number of beds at Kanti Children's Hospital by 150 under its current 8th five-year plan. Thus it is in line with the central

government's health policy to expand and improve the hospital's facilities and equipment. But it will be necessary to implement this project from a medium to long-term perspective, on the basis of the following three basic concepts:

1) Expanding the limited existing facilities
2) Revising the current inefficient arrangement of functions
3) Rebuilding the superannuated facilities

The space on the northern side of the existing main building (currently used as a parking lot and open space) will be used as the site for this project so that the functional relationships among the departments may be kept and the construction work under the project may not be a hindrance to the hospital's operations.

Judging from the above observations it is appropriate and necessary to implement this project. Because it is an urgent necessity for KCH to expand and improve the hospital's facilities and equipment in order to perform its expected responsibility in child health care.

3-2-2 Examination of the Project Operation Plan

(1) Personnel Plan

The Ministry of Health's plan for the future of Kanti Children's Hospital envisages a total of 300 beds and a staff of 942. According to the 8th five-year plan, on the other hand, it is expected that the number of beds in Kanti Children's Hospital will be increased to 300 by 1997. But it will be difficult to attain the goal by that year. In view of the fact that the government of the Kingdom of Nepal has to start reducing the number of public service personnel in consultation with the World Bank and

other international organizations, it will be difficult to dramatically expand the staff of the hospital. For this reason, the present staff of the hospital will be responsible for the operation and management of its facilities after the completion of this project. It will be necessary, however, to fill vacancies caused by the retirement of a surgical consultant, a medical consultant and an anesthetist and also recruit a bachelor nurse, seven staff nurses and six ANMs. It is considered realistic to recruit the above-mentioned staff to that extent since necessary costs can be covered by the hospital income.

(2) Operating Budget Plan

The size of the hospital's annual operating budget when this project is completed is estimated at 24,030,000 rupees, as stated in "3-3-5 Operating Plan," which is 1.38 times as large as the hospital's annual expenditures for 1991-92 (17,245,000 rupees). However, the percentage of the latter figure to the central government's annual budget for the same year is only 0.05. Since the amount of contribution from the central government to the hospital is projected to grow at an annual rate of 7 percent, which is the average for the past five years, it will be easily possible for the hospital to bear the operating cost after the completion of the project. Furthermore, the hospital's incomes from the operation of the projected pay beds, the central diagnosis department and the clinical laboratory department will be added to the hospital's annual budget. Thus there will be no problem with the hospital's operating cost after the completion of this project.

3-2-3 Study on Components of the Project

Under this project, the hospital will provide clinical health care services mainly medical examination/treatment. And the hospital also provide the activities as the central referral hospital, pediatric training hospital and as a maternal and child health service hospital with the service of immunization and family planning. These functions are already performed to some extent by the hospital's existing facilities. At the hospital, training in pediatrics and maternal and child health care are ancillary to clinical services. Thus, the project is aimed at expanding the existing functions of the hospital.

The hospital's clinical health care services will be provided to both outpatients and inpatients through the departments of outpatient, emergency, central diagnosis, operation, central supply (CSSD), intensive care (ICU), clinical laboratory and ward. It is expected to fulfill necessary basic functions of a children's hospital, and will also accept patients referred from other hospitals and health centres. And the plan of this project is to be possible to strengthen and expand the hospital's basic functions in the future.

As a pediatric training hospital for Tribhuvan University, Institute of Medicine, which is the country's sole institution for the education and training of medical personnel, Kanti Children's Hospital has trained a total of 462 medical students over the past five years. The hospital offers a pediatric course at the undergraduate level, a pediatric nursing course at the undergraduate level, a pediatric nursing course at the Nursing Certificate level, and a pediatric course at the Certification Medical Science level.

Since the Ministry of Health is directly responsible for maternal and child health care, the hospital's role in this field is basically to support the ministry's operations by offering a place for maternal and child health care. Under this project, therefore, this system will be maintained, as a hospital participating in the Expanded Programme on Immunization and guidance on family planning.

3-2-4 Examination of the Details of the Requested Facilities and Equipment

It is necessary to determine the optimum scale of the project by using estimated values for the hospital's operations in the year 2000 and then assessing the operational aspects of the project.

(1) Facility

1) Outpatient Department

The outpatient department consists of medical outpatient, surgical outpatient and dental outpatient section. The projected numbers of outpatients for 1991-92 through 1999/2000 are as shown in Table 3-1.

Table 3-1 Projected Number of Outpatient

No. of Outpatient		'91/'92	'92/'93	'93/'94	'94/'95	'95/'96	'96/'97	'97/'98	'98/'99	(planned year) '99/2000
Medical	Max.	44,499 (14%)	50,728	57,830	65,927	75,157	85,679	97,674	111,348	126,937
	Min.	44,499 (11.7%)	48,711	53,322	58,369	63,895	69,943	76,564	83,811	91,745
Surgical	Max.	4,914 (12%)	5,503	6,164	6,903	7,732	8,660	9,699	10,863	12,166
	Min.	4,914 (4.6%)	5,140	5,376	5,623	5,882	6,153	6,436	6,732	7,041
Dental	Max.	2,542 (27%)	3,228	4,099	5,206	6,612	8,398	10,665	13,545	17,203
	Min.	2,542 (9.9%)	2,737	2,948	3,175	3,420	3,683	3,967	4,272	4,601
ORT	Max.	5,762 (35%)	7,778	10,500	14,175	19,136	25,834	34,876	47,083	63,562
	Min.	5,762 (22%)	6,889	8,236	9,847	11,773	14,076	16,830	20,122	24,058
Total	Max.	57,717	67,237	78,593	92,211	108,637	128,571	152,914	182,839	219,868
	Min.	57,717	63,477	69,882	77,009	84,970	93,855	103,797	114,937	127,445

The maximum figures shown in the table above were calculated on the assumption that the number of outpatients will increase at the average annual rate for the past five years till the year 2000, and the minimum figures on the assumption that the number of outpatients will increase at an annual growth rate calculated by adjusting the mean value for 1991 and 1992, when the growth rate remained stable. Since it is expected that the hospital's facilities will be operated by its present staff for some time after the completion of the project and that there will be no substantial increase in its staff, the scale of this project is to be determined on the basis of the minimum figures shown in the table above.

The daily number of outpatients to visit each of the four sections is calculated as follows.

- Medical : 91,745/year ÷ 285 (hospital days) = 321/day
- Surgical : 7,041/year ÷ 285 (hospital days) = 25/day
- Dental : 4,601/year ÷ 285 (hospital days) = 16/day
- ORT : 24,058/year ÷ 285 (hospital days) = 84/day

On the other hand, the daily numbers of outpatients who will be able to receive medical examination/treatment by the present medical staff are as follows.

Table 3-2 Projected Number of Outpatient

Outpatient	No. of Medical Staffs	Average examination time	Hospital Hour	Patient/day
Medical (include ORT)	11	5~10Min.	9:00~14:00	440
Surgical	3	20~30Min.	9:00~14:00	36
Dental	2	10~30Min.	9:00~14:00	30

The daily numbers of patients calculated on the basis of the mean value for 1991 and 1992 can be used in determining the scale of the project since they are smaller than the daily numbers of patients to receive medical examination/treatment by the present medical staff.

2) Emergency Department

The emergency department is functioning as an after-hours outpatient department. At present, the department, with a staff of two doctors and six nurses, is providing medical services for as many as 40 to 100 patients a day using a treatment room and a six-bed observation room. In determining the scale of this project, the projected numbers of emergency patients must be calculated in the same way as in the calculation of the projected numbers of outpatients.

Table 3-3 Projected Number of Emergency Patient

patient	'91/'92	'92/'93	'93/'94	'94/'95	'95/'96	'96/'97	'97/'98	'98/'99	(Planned year) '99/2000
Max. (vs. previous year)	28,702 (31%)	37,599	49,255	64,524	84,526	110,729	145,055	190,023	248,930
Min. (vs. previous year)	28,702 (10.5%)	31,081	33,658	36,448	39,469	42,741	46,285	50,122	54,277

As can be seen from the table above, the maximum annual number of emergency patients for 1999-2000, calculated using the average annual growth rate for the past five years, is 248,930, and the corresponding minimum annual number of emergency patients, calculated using the mean value for the past two years when the growth rate is stable, is 54,277.

3) Central Diagnosis Department

The projected numbers of X-ray and other diagnoses are as shown in the table below.

Table 3-4 Projected Number of X-ray and Other Diagnosis

Item of Diagnosis		1991/1992	1994/1995	Planned year 1999/2000
X-ray	Max.	26,823 (25%)	52,388	159,877
	Min.	26,823 (14%)	38,946	74,984
Ultrasonic	Max.	752 (36%)	1,891	8,800
	Min.	752 (30%)	1,619	6,011
ECG	Max.	160 (60%)	655	6,871
	Min.	160 (10%)	208	336

The maximum annual number of X-ray diagnoses projected for 1999-2000, calculated on the basis of the average annual growth rate for the past four years, is 159,877. On the other hand, the minimum annual number

of X-ray diagnoses calculated on the basis of the annual growth rate for 1992 when the growth rate in stable, is 74,984. The corresponding maximum and minimum annual numbers of ultrasonic diagnoses, calculated in the same way as in the case of X-ray diagnoses, are 8,800 and 6,011 respectively, and those for electrocardiograph diagnoses are 6,871 and 336 respectively. The minimum figure is used in determining the scale of this project.

4) Operation Department

The projected annual numbers of operations performed at Kanti Children's Hospital are as shown in the following table. In the calculation of the projected annual numbers of operations, those calculated using the average mean value for the past five years are the maximum numbers and those calculated using the mean value for 1991 and 1992 are the minimum figures.

Table 3-5 Projected Number of Operation

		1992	1995	Planned year 2000	average Hour
Operation	Max.	1,223 (22%)	2,220	6,002	2
	Min.	1,223 (8%)	1,540	1,925	

The necessary number of operating rooms is calculated using the minimum annual number of operations for 1999-2000 as follows:

1,925 cases/year ÷ 285days/year × 2 hours/cases ÷ 5 hours/days ≒ 2.7

Thus, it will be necessary for the hospital to have two to three operating rooms to perform as many as 1,925 operations a year. If an ideal daily number of operations per operating room is two to three

(as in Japan), the necessary number of operating rooms is 2.7 (1,925 cases/year ÷ 285 days/year ÷ 2.5 cases/day).

Since the operations are to be carried out by its present staff, the minimum necessary number of operations should be three.

5) Central Supply (CSSD) Department

In the case of the Central Supply Department (CSSD), functions of three rooms -- the washing room, sterilizing room and the preparation room -- are performed in one room. The washing section does not have enough space for the filth treatment tank, the washing tank and the rinsing tank. It has no drier. The sterilizing section is provided with a steam sterilizing unit but there are no working table or shelf to store equipment and materials. At the preparation section, it is feared that unsanitary articles may get mixed with washed ones. Under this project, the three functions should be performed in separate rooms, each with an ample space. The CSSD should also be provided with a clean storage so that each equipment and materials installed in proper place may be used in sanitary condition.

6) Intensive Care (ICU) Department

The PICU should be located adjacent to the NICU because it will be necessary to operate by staff members in charge of the NICU. Since treatment of infectious diseases will also be treated at the PICU, however, it should be separated from the NICU with a partition. On the other hand, the SICU should be located adjacent to the operating department and should be operated in close linkage with the recovery bed room as a measure to cope with the shortage of personnel.

7) Clinical Laboratory Department

The projected numbers of tests performed at the hospital are shown in the following table. In the calculation of the projected annual numbers of tests, those calculated using the average mean value for the past five years are the maximum numbers and those calculated using the mean value for 1991 and 1992 are the minimum figures.

Table 3-6 Projected Number of Tests

Test Item		1991/92	1994/95	Planned year 1999/2000
Biochemistry	Max.	1,564 (31%)	3,516	13,564
	Min.	1,564 (12%)	2,204	3,884
Bacteria	Max.	6,698 (20%)	11,574	28,800
	Min.	6,698 (14%)	9,923	19,106
Hematology	Max.	16,200 (27%)	33,183	109,633
	Min.	16,200 (16%)	25,286	53,110
Parasite	Max.	33,535 (14%)	49,683	95,661
	Min.	33,535 (10%)	44,635	71,885

The size of the bleeding room, the hematology room, the bacteriology room and the parasitology room should be determined on the basis of the projected minimum numbers of tests.

8) Ward

Since there have been no wide variations in the past growth rate for the number of inpatients, the projected numbers of inpatients are shown as ones calculated on the basis of the mean values for the past five years in the table below.

Table 3-7 Projected Number of Inpatients

No. of inpatient	'92	'93	'94	'95	'96	'97	'98	'99	planned year 2000
Total	6,798 (2.2%)	6,948	7,100	7,257	7,416	7,579	7,746	7,916	8,090
Medical	5,643	5,767	5,893	6,023	6,155	6,290	6,429	6,570	6,714
Surgical	1,155	1,181	1,207	1,234	1,261	1,287	1,317	1,346	1,376

If the annual number of inpatients projected for the year 2000 is 8,090 and the average length of hospitalization is 8.24 days, then the necessary number of beds is:

8,090/year × 8.24 days ÷ 365 days ≒ 183

Although the government of Nepal thinks the necessary number of beds is 300, it should be less than 200.

(2) Equipment

The contents of the requested items of equipment were examined taking into consideration the technical level of the hospital's medical personnel, that of its engineers in charge of maintenance and management of medical equipment, that of local suppliers of medical equipment and the supply situation for spare parts and consumables. The results of the examination are as described below.

1) Outpatient Department

Since the hospital's pharmacy does not dispense drugs, there is no need to procure drug dispensing equipment. In addition, the requested number of equipment is not in line with the actual situation of their use, and therefore the number should be drastically reduced. On the other hand, there is a strong need for basic items of medical equipment such as sphygmomanometer and stethoscopes.

2) Emergency Department

The emergency department acts also as an after-hours outpatient department, accepting not only emergency patients from the city of Kathmandu but also outpatients from rural areas after 14:00. For this reason, this department is considered to form a part of the outpatient department. Most of the requested items of equipment for this department are basic items of medical equipment and they are urgently needed. However, such devices as IV infusion pumps are not directly related to the operations of the outpatient department and are therefore unnecessary.

3) Central Diagnosis Department

Since the X-ray TV machine which is the main equipment of this department, is now in irreparable condition, this department's medical staff are treating patients based on their past experience. The plain X-ray machine which is an import from India, frequently breaks down and it is very difficult to maintain and manage it. Furthermore, the portable X-ray machine is used very frequently at the operating room and the outpatient department. It is therefore urgently necessary to procure these items of equipment anew.

4) Operation Department

At this department, most basic items of medical equipment have already been procured under Japanese grant aid, and there is no need to procure additional items. However, some items such as the IV infusion pump and the anesthetization equipment are out of order and in irreparable condition. There is a need to resolve this problem.

5) Central Supply Department

Part of the contents of the request concerning this department overlap those concerning the ward department, and those items of equipment which are included in such an overlapping area should be deleted. However, there is a strong need for the high-pressure steam sterilizer and the desk-top sterilizer. Such consumables as tubes are to be reused, and therefore there is a need to procure the tube cleaning unit and the tube drier, both of which are in short supply.

6) Intensive Care Department

This department is better provided with sophisticated items of medical equipment than other departments, and few of its existing items of equipment require replacement. However, the two existing incubators are in irreparable condition, and therefore it is necessary to procure incubators anew. Such items of equipment as pulse Oxymeter and infant warmers are in a condition of short supply because of an increase in the number of patients. It is necessary to secure additional supplies of these items.

7) Clinical Laboratory Department

Most of the requested items of equipment are basic ones, and there is a strong need for them. While most of the existing items of equipment are in use, they are in a condition of short supply because of the sharp increase in the number of patients. It is necessary to procure basic items of equipment such as centrifuges, stirrers, microscopes and distillers.

8) Ward Department

Although the equipment like IV infusion pumps and defibrillator were requested, they are not urgently needed. In addition, the requested quantity of these items is not in line with the actual situation of their use. It is necessary, therefore, to drastically reduce the quantity of these items. However, there is a strong need for emergency carts, medical record files and wagons, all of which are in a condition of short supply.

9) Other

At the hospital's laundry, washed linen goods are spread over the ground for drying. It is necessary to resolve such a situation as soon as possible. In addition, the laundry is not provided with adequate numbers of washing machines. As a result, the laundry is finding it difficult to meet the washing needs of the hospital's sections and departments. It is urgently necessary to procure necessary numbers of washing machines. Washing machines should be durable, simple to operate, and easy to maintain.

3-2-5 Examination of the Necessity of Technical Cooperation

Since this project is aimed primarily at improving the hospital's operation through the expansion and improvement of the hospital's existing facilities and equipment, it will be possible for the Nepalese side to operate and manage the facilities and equipment procured under this project after the completion of this project. On the other hand, the hospital is required to strengthen its functions as a central referral institution in the field of children's health care and as a teaching

hospital. It is imperative, therefore, to take measures to enhance the technical level of medical services at the hospital.

The government of Nepal understands well the importance and necessity of technical cooperation in conjunction with this project, and is in the process of making preparations for making request to the government of Japan for such technical cooperation. The contents and the method of the execution of such technical cooperation are to be decided by the governments of both countries. Judging from the contents of this project, such technical cooperation should be offered in the areas of children's health care and the maintenance and management of the medical equipment. In implementing such technical cooperation, it is desirable to implement such technical cooperation as a mini-project-type technical cooperation project, since technical cooperation is needed in various technical fields. It will be necessary that Japanese experts be sent to the project site and that their Nepalese counterparts be sent to Japan for short-term training.

Since the detail of the necessary cooperation for this project is similar to the project-type technical cooperation by Japanese Government which is now underway at Tribhuvan University, Institute of Medicine and they are overlap each other in terms of the contents of technical cooperation. The most effective technical cooperation to Kanti Children's Hospital will be executed under this project-type technical cooperation at Tribhuvan University, Institute of Medicine. It is therefore very important for both parties, Kanti Children's Hospital and Tribhuvan University, Institute of Medicine, to collaborate for facilitating future technical cooperation.

3-2-6 Basic Policy of Japanese Grant Aid Assistance for the Project

As a result of the above examination, it has been judged appropriate to implement this project in the form of grant aid assistance from the government of Japan. Since under this project, the construction of new facilities, the remodeling of part of the existing facilities and the demolition of a part of the existing facilities are to be carried out in a manner that does not interrupt operations at the hospital's existing facilities, it is necessary that this project should be implemented in two phases -- Phase 1 (construction of new facilities) and Phase 2 (transfer of some functions of the existing facilities, demolition and renovation).

In pages that follow, the outline of this project will be examined and a basic design for this project will be worked out on the assumption that this project will be implemented under Japanese grant aid.

3-3 Outline of the Project

3-3-1 Implementing Organization and Management System

(1) Project Implementing Organization

Kanti Children's Hospital, which is operating under the control of the Ministry of Health, is the organization responsible for the implementation of this project.

(2) Project Management System

Although operating under the control and supervision of the Ministry of Health, Kanti Children's Hospital is granted substantial autonomy. The K.C.H. Development Board, which was formed as an organization to support the hospital, is playing an important role in the operation and management of the hospital by securing fiscal resources for the hospital by operating its own fund and employing many contract staff members. The committee consists of 11 members, including qualified businessmen and representatives of Tribhuvan University and the Nepal Pediatric Society. Decisions on all matters except for routine management of the hospital are made by the committee and executed by the director of the hospital. This management system will be maintained after the completion of this project.

(3) Personnel Plan

The Ministry of Health's plan for the future of the hospital envisages a total of 300 beds and a staff of 942. But no specific timing of the attainment of this goal has yet been fixed. Since it is difficult to increase the hospital's staff in view of the need to drastically reduce the number of the country's public service personnel, this project is designed to be operated and managed sufficiently by the present staff of the hospital. However, it is necessary to fill vacancies caused by the

retirement of one surgical consultant, one medical consultant and one anesthetist, and recruit one nurse, seven staff nurses and six ANMs to cope with an increase in the number of beds under this project. For this reason, this increase in the hospital staff is to be covered by the hospital's incomes as tentatively calculated in "3-3-4(4)." The following table shows the plan to increase the hospital's staff under this project.

Table 3-8 Personnel Plan

Post	Class	Salary	Department						Total
			medical	surgical	ward	CSSD	OT	outpatient	
Consultant	GI	4,800	1	1					2
Anesthetist	GII	4,000		1					1
Nurse	GII	4,000			1				1
Staff Nurse	N·GI	2,000			5	1	1		7
ANM	NGII	1,650			4	1	1		6

3-3-2 Activity Plan

At Kanti Children's Hospital, health care activities are carried out by its sections and departments as shown in Fig. 1 in "2-3-1" and this operational system is to be continued after the completion of this project. The service plan for each department after the completion of this project is as described below.

1) Outpatient Department

At the medical and ORT sections, first visit medical outpatients will receive medical examination/treatment by a staff of two consultant and six registrars, and revisit medical outpatients by a staff of a consultant and two registrars. At the surgical section, treatment of burns, bone fractures and cystomas will be conducted by a staff of three surgeons, and dental treatment by a staff of two doctors.

2) Emergency Department

This department will be responsible for after-hours medical examination/treatment and emergency treatment. This department is to serve also as an after-hours outpatient department.

At this department, two medical officers -- a surgical medical officer and a medical officer -- will be working around the clock, in shifts of eight hours, and a registrar and a consultant will stand by on an on-call basis.

3) Central Diagnosis Department

This department will be responsible for conducting X-ray and other imaging diagnoses of patients referred from the outpatient department and inpatients requiring postoperative care. At this department, steps will be taken to improve the quality of general X-ray diagnosis, barium enema diagnosis, general ultrasonic diagnosis, diagnosis by the use of the electrocardiograph, and ultrasonic examinations to diagnose children's heart diseases, whose incidence is on the rise in the country so that the staff may be able to make more precise decisions and take more relevant treatment measures.

4) Operation Department

As stated in "3-2-4 Examination of the Details of the Requested Facilities," the quality of operations will be improved through the easing of the tight operation schedule. And in order to function more effectively as the operating room of the training hospital, it needed to be provide a enough space for medical students to study by observation.