JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

HEALTH DEPARTMENT
NORTH WEST FRONTIER PROVINCE
THE ISLAMIC REPUBLIC OF PAKISTAN

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR THE IMPROVEMENT OF MEDICAL EQUIPMENT FOR THE NORTH WEST FRONTIER PROVINCE IN THE ISLAMIC REPUBLIC OF PAKISTAN

APRIL 1994

INTERNATIONAL TOTAL ENGINEERING CORPORATION

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PREFACE

In response to a request of the Government of the Islamic Republic of Pakistan, the Government of Japan decided to conduct a basic design study on the Project for the Improvement of Medical Equipment for the North West Frontier Province and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Pakistan a study team B/D 1 headed by Mr. Shin-ya SUZUKI of the Grant Aid Division, Bureau of Economic Cooperation, Ministry of Foreign Affairs, another study team B/D 2 headed by Dr. Tamotsu NAKASA, Expert Service Division, Bureau of International Cooperation, International Medical Center of Japan, the Ministry of Health and Welfare, and the other study team B/D 3 headed by the aforesaid Dr. Tamotsu NAKASA and constituted by members of International Total Engineering Corporation, from August 16 to 26, October 18 to November 19, 1993 and February 1st to 20th, 1994.

The team held discussions with the officials concerned of the Government of Pakistan and conducted a field survey at the site of the proposed project. After the team returned to Japan, further studies were made. Then, after going through the explanation and discussion of the draft report of the project with the officials in Pakistan from April 8 to 17, 1994, the present report was prepared.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Islamic Republic of Pakistan for their close cooperation extended to the teams.

April, 1994

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

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

Letter of Transmittal

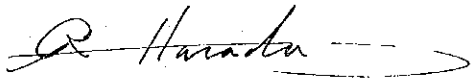
We are pleased to submit to you the basic design study report on the Project for the Improvement of Medical Equipment for the North West Frontier Province in the Islamic Republic of Pakistan.

This study has been made by International Total Engineering Corporation in compliance with a contract with JICA, requiring a period of 9 months from July 28, 1993 to April 28, 1994. Throughout the study, we have taken into full consideration the present situation of the Islamic Republic of Pakistan 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, and the Ministry of Health and Welfare. We also wish to express our deep gratitude to the officials concerned of the Health Department of the North West Frontier Province and of the Ministry of Health, Special Education and Social Welfare of Pakistan, JICA Pakistan office, and Japanese Embassy in Pakistan 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.

April, 1994



Project Manager, Ryoji HARADA

Basic design study team on the Project for the Improvement of Medical Equipment for the North West Frontier Province,

International Total Engineering Corporation

LOCATION MAP OF PROJECT SITE

NORTH WEST FRONTIER PROVINCE

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ADP	Annual Development Plan
ARI	Acute Respiratory Infections
BHU	Basic Health Unit
DHQ	District Headquarter
EPI	Expanded Programme on Immunization
FATA	Federally Administered Tribal Area
ICD	Italian Cooperation for Development
MCH	Maternal and Child Health
ODA	Overseas Development Administration
OPD	Outpatient Department
PIU	Project Implementation Unit
RHC	Rural Health Centre
SAP	Social Action Programme
SCF	Save the Children Fund
TBA	Traditional Birth Attendant
THQ	Tehsil Headquarter
USAID	United States Agency for International Development
UNICEF	United Nations Childrens Fund
WFP	World Food Programme
WHO	World Health Organization

SUMMARY

SUMMARY

The Islamic Republic of Pakistan (hereinafter referred as Pakistan) covers an area of roughly 796,000 km2 or about twice that of Japan, and possesses a total population of 121 million (as of 1993). Its land lies adjacent to India, Iran, Afghanistan and China, and on its southern side, faces the Arabian Sea. In terms of climate, it lies in the subtropical zone, however the north is a mountainous region and the west side estuary of the Indus River which flows through the center of the country is desert, and so there are marked regional differences.

Since the middle of the 1970's, the Government of Pakistan has been striving to develop the rural basic health care system. This is reflected by increases in the ratio of the development budget allocated to rural health projects. As a result of this, the infrastructure for basic regional health has been strikingly expanded. However in terms of quality, the health services still cannot be described as sufficient due to shortages both in the supply of equipment and in personnel. The health care policy initiative for 1990 has continued to lay the emphasis on primary health care.

However despite this, the level of public health in Pakistan still remains among the lowest in Asia, and together with control of population growth, the improvement of primary health care remains the largest issue in terms of public health and medical care policy. As well as this, there exist major differences in terms of health care between the cities and the rural villages. According to statistics for the period between 1989 and 1990, whereas 99% of city dwellers have access to public health services, the same figure drops to 35% in the rural areas.

In order to improve this situation, the government of North West Frontier Province which is one of the four provinces in Pakistan compiled the 'Project for the Improvement of Medical Equipment for the North West Frontier Province' which is the subject of this project in hand. The Government of North West Frontier Province has by its own efforts constructed BHUs and RHCs which act as primary medical institutions and has officially requested Japanese grant aid for the improvement of equipment in those institutions.

In response to this, the Government of Japan decided to carry out a basic design study of the project, and in both August and October of 1993 and February of 1994 the Japan International Cooperation Agency (JICA) dispatched basic design study teams to Pakistan in order to review the need and validity of medical equipment improvement as regards the aforesaid project and to carry out basic design into whether or not it is in terms of limits, scale and equipment content, the optimum form of cooperation that can be performed by the Government of Japan. These surveys found that much of this project overlaps with other aid projects. The study teams carried out site surveys which included discussions with representatives of both the Pakistan and North West Frontier Province Governments,and also discussions concerning the adjustment of overlapping areas with international aid agencies.

After the ensuring domestic analysis and briefing in Pakistan of the draft report in April 1994, this Basic Design Study Report was compiled.

The official request from the Government of Pakistan is for the procurement of medical equipment in the BHUs and RHCs or primary medical care institutions. 663 BHUs and 74 RHCs are the object of the official request. Requested equipment is divided into two levels: that for BHU use and that for RHC use. The main requested equipment is shown in the following table.

Major Requested Items

(1) Equipment for BHU

department	major requested items
minor surgery	minor surgery instruments
obstetrics	obstetric instruments set, delivery table
laboratory	laboratory equipment & table
light vehicles	bicycle, motorcycle
furniture	examining couch, office table & chair

(2) Equipment for RHC

department	major requested items
surgery	forceps, operation theatre table, anaesthesia apparatus
obstetrics	delivery forceps, delivery table
laboratory	autoclaves, centrifuges
radiology	X-ray plants, developing system
dental	dental units, instrument sets
autopsy	autopsy instrument sets
vehicles	ambulances, vehicles
others	typewriter, air conditioners, generators

In the event where this project is executed with Japanese grant aid, the annual maintenance costs of Rs. 5.5 million to be paid by the Pakistan side are estimated. This includes replacement parts and consumables, and because this figure amounts to roughly 13% of the maintenance budget for the North West Frontier Province and supplementary budget has been made in the past, it is judged to be affordable for the Pakistan side. The execution period for the project, from the conclusion of equipment supply contracts to the completion of installation work, is estimated to be 10 months.

Regarding the Pakistan authorities concerned in the execution of the project, the North West Frontier Province Health Department shall be the main responsibility for execution.

If proper management is implemented by the Pakistan side in the execution of the project, the following results are expected.

(1) The North West Frontier Province health care system is composed of three educational hospitals and DHQ hospitals in each district which act as tertiary referral facilities, and THQ hospitals which fulfill secondary medical care roles. These are all top level bodies within the system. The

subject of this project will be the 74 RHCs and 663 BHUs which are ranked below these institutions. When one considers the fact that these RHCs and BHUs are used by local residents on a day to day basis, one can realize that these bodies play an extremely important role within the North West Frontier Province health service system. Moreover, because the rural population of the said province amounts to some 85% of the total, major beneficial effects are expected for the residents of North West Frontier Province.

(2) The functional strengthening of these RHCs and BHUs by this project will help to improve the North West Frontier Province primary health services, rectify regional differences and contribute to the promotion of the SAP(Social Action Programme) which is being carried out by the Government of Pakistan as a high priority policy.

Therefore, it is judged that the execution of this project through grant aid carries much meaning and is valid, and as well as this, its ensuing effects are expected to be sufficient.

In order to ensure smooth project execution and the lasting utilization of procured equipment, the following suggestions are given.

(1) Budgetary Measures

Judging from the fact that under the present situation, supply of replacement parts for current equipment is difficult, measures such as the compulsory onerous supply of replacement parts and consumable for a period of around eight years from delivery after the first year of warrantee period are included in conditions of the Supply contract. Moreover, an annual figure of around Rs. 5.5 million must be prepared by the Ministry of Health for such replacement parts and consumable.

(2) Equipment Maintenance

Procurement of equipment replacement parts and consumable is currently the responsibility of the district health officer in each district. However,

it is a fact that operation and control of equipment is not functioning appropriately. For the purpose of equipment maintenance, a project for the establishment of medical equipment workshops within North West Frontier Province with the object of carrying out equipment maintenance and repair is underway. Discussions with the technicians of such workshops proved that technical levels for the repair and maintenance of project equipment are sufficient. However, as for electrical equipment, Government of Japan tries to help raising the technical capability in such workshops by virtue of providing circuit diagrams, service manuals including lists of replacement parts and consumables and also information on agents being able to deliver such items as well as carrying out training in repair service techniques. As a result, it is desirable to provide support in the construction of the medical equipment maintenance setup in North West Frontier Province. In order to cope with the future increase in the quantity of equipment, it is advised that a strengthening of personnel is planned under the Third Health Project.

(3) Improvement of Sanitation Facilities

The present treatment facilities for urine and drainage in the BHUs and RHCs are lacking and such waste liquids are being washed away into sewage or the ground in an untreated manner. It is possible that infectious pathogenic bacteria are included in such waste liquids, and as a result, there is a chance of secondary infections occurring from ground water or river water. This project will ensure that laboratory waste liquids are drained away after being sterilized with table-top auto calves, however it is desirable that the Health Department carries out improvements to make sure the RHCs and BHUs do not become sources of infections.

CONTENTS

CHAPTER 1 INTRODUCTION

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Since the middle of the 1970's, the Government of the Islamic Republic of Pakistan (hereinafter referred as Pakistan) has strived to develop its system of basic rural health service. This is reflected in the increased ratio of the development budget being allocated to rural health projects. As a result, the infrastructure of basic rural health has been markedly expanded. However, due to the qualitative shortage in the supply of equipment and personnel deployment, the health services still cannot be described as being sufficient. The health policy initiative for 1990 has continued to lay the emphasis on primary and preventive medicine.

However despite this, the level of health service in Pakistan still remains among the lowest in Asia, and together with control of population growth, the improvement of primary health care remains the largest issue in terms of health policy. As well as this, there exist major differences in terms of health services between the cities and the rural villages. According to statistics for the period between 1989 and 1990, whereas 99% of city dwellers have access to health services, the same figure drops to 35% in the rural areas.

In order to improve this situation, the government of North West Frontier Province (hereinafter called as NWFP) compiled the 'Project for the Improvement of Medical Equipment for the North West Frontier Province' which is the subject of this project. The NWFP Government has by its own efforts constructed BHUs and RHCs which act as primary health care institutions and has officially requested Japanese grant aid for the improvement of equipment in those institutions.

In response to this, the Government of Japan decided to carry out a basic design study of the project, and the Japan International Cooperation Agency sent two basic design study teams (B/D 1 and B/D 2) to Pakistan in order to review the need and validity of medical equipment improvement as regards the aforesaid project and to carry out basic design into whether or not it is in terms of limits, scale and equipment content, the optimum form of cooperation that can be performed by the Government of Japan. B/D 1 carried out its basic design study from August 16 to August 26, 1993 and was led by Mr. Shin-ya SUZUKI of the Grant

Aid Division, Bureau of Economic Cooperation, Ministry of Foreign Affairs. B/D 2 was led by Dr. Tamotsu NAKASA of the Expert Service Division, Bureau of International Cooperation, International Medical Center of Japan, Ministry of Health and Welfare and carried out its study from October 18 to November 11, 1993. B/D 1 and B/D 2 found that much of this project overlaps with other aid projects. The main overlapping areas are the procurement of ambulances, BHU equipment and microscopes under the World Bank Family Health Project, and the procurement of X-ray equipment under the Asian Development Bank Third Health Project. In order to carry out the discussions and adjustments caused by such overlapping in the request,another basic design study team B/D 3 again led by Dr. Nakasa was dispatched to Pakistan and to the headquarters of the World Bank from February 1 to 20, 1994.

The study teams carried out site surveys which included discussions with representatives of both the Pakistan and NWFP Governments, and also discussions concerning the adjustment of overlapping areas with international aid agencies. On their return to Japan, they devised the basic design for this project and compiled it into a draft report.

From April 8 to April 17, 1994, the Japan International Cooperation Agency dispatched in order to explain the draft final report a study team led by Dr. Atsuko AOYAMA of the Expert Service Division, Bureau of International Cooperation, International Medical Center of Japan, Ministry of Health and Welfare to Pakistan and the study team held discussions on the above-mentioned overlapping with the Government of NWFP and missions from the World Bank and the Asian Development Bank (hereinafter called as ADB). As the result of discussions the mutual consent has been obtained on the issue as described in the draft final report.

Mr. Christopher D Walker from World Bank headquarters mentioned in the discussions with the study team as the following.

(1) We appreciate the participation of Government of Japan in the field of Primary Health Care.

(2) This kind of overlapping occurs often and it is not a serious matter. However we can not consent projects which may delay or run counter to World Bank projects. For example there is much possibility that assistance to construct medical institutions of highest levels would cause difficulty to run primary health care facilities as such institutions require very high running costs which may pressure the health finance of a region.
Therefore such assistance should be reviewd not to accept.

Dr. Wan Azmin from ADB headquarters mentioned as the following.

(1) We consent on the execution of the Project by the Government of Japan.

(2) We request the Government of NWFP to issue an official letter asking ADB for reallocation of the credit line.

(3) We suggest the Government of Japan to execute projects to improve higher level medical institutions than the secondary level ones in order to avoid an overlapping in the mean time.

This report has been compiled as the result of these efforts. Members of the study teams, schedules, lists of interviewees and minutes of discussions are attached to the end of this report.

CHAPTER 2 PROJECT BACKGROUND

CHAPTER 2 PROJECT BACKGROUND

2-1 General Situation in the Islamic Republic of Pakistan

Pakistan covers an area of roughly 796,000 km2 or about twice that of Japan. It stretches some 1,000 km from east to west and about 1,600 km from north to south. In terms of climate, it lies in the subtropical zone, however the north is a mountainous region and the west side estuary of the Indus River which flows through the center of the country is desert, and so there are marked regional differences.

The total population of Pakistan was 121 million in 1993 of which 56.1% live in Punjab Province, 22.6% live in Sind Province, 13.1% live in North-West Frontier Province, 5.6% live in Balochistan and 2.6% live in Federally Administered Tribal Area (FATA). The rate of population growth has continually exceeded 3% between 1965 and 1993 which is a rather high figure even compared to surrounding countries and other developing nations.

The state religion is Islam and indeed over 90% of the population are Muslims. The political system is that of a federal republic based upon Islamic religion and the administrative units are divided into the four aforementioned provinces, FATA, Northern Area, Islamabad Capital Teritory and the Azad Kashmir region.

The industry specific share of the GDP of Pakistan is as follows: agriculture, forestry and fisheries - about 26%; manufacturing - about 16.8%; transport - about 7.9%. This shows that agriculture is an important industry which supports the Pakistan economy.

2-2 General Situation of the Pakistan Health Care Sectors

2-2-1 Health and Indicators

The Government of Pakistan has consistently compiled health projects within its five year plans. At present, the Eighth Five Year Plan (1993 to 1997) is underway and efforts are being in the health care sectors to achieve the goal of

'health for all by 2000.' However, as was stated in the Seventh Plan, problems such as economic restraints, the securing of regional medical facilities staff and a lack of instructors are hindering the effectiveness of the project.

The major health indicators for Pakistan and its surrounding countries are displayed in Table 2-1.

The total population of Pakistan in 1993 was around 121 million, of which some 70% live scattered around its rural areas. The rate of population growth is on average 3.1% which is the highest figure of any country in Asia.

Although the crude mortality rate fell sharply between 1965 and 1991, the crude birth rate has only shown a minor decrease.

Recent statistics relating to diseases and causes of death are lacking, however on analyzing materials compiled by international agencies, it can be seen that the major diseases are infectious diseases, malaria and tuberculosis followed by cardiovascular system disorders. Among children, major causes of death are measles, neonatal tetanus and diarrhea and malnutrition caused by a lack of protein consumption is a major problem and can be seen in many infants and pre-school children.

Access to safe water in rural areas is only 20% and due to the lack of hygiene, cholera, typhoid fever and diarrhea are widespread. In particular, deaths of infants due to dehydration caused by diarrhea are very common. Common cause of neonatal death is neonatal tetanus, pregnant women give birth at home without attendance of trained health personnel and due to the poor state of hygiene involved in the disposition.

As can be seen from table 2-1, the literacy rate in Pakistan is low compared to other nearby Asian countries and this proves to be a hindrance to health and education. Moreover, due to cultural reasons, women tend to be segregated, especially so in the rural areas where women despise examinations by male doctors. Efforts are thus being made to foster more female doctors in order to improve the state of maternal and child health.

Table 2-1 Comparison of Health Indicators for Pakistan and Surrounding Countrues

Year / Country	GNP per capita	Annual population growth rate (%)			Crude birth rate (/1000pop)		Crude death rate (/1000pop)		Life expectancy at birth (years)				Infant mortality rate (/1000 live births)		Under 5 mortality rate (/1000 live births)		Maternal mortality rate (/100,000 births)		Illiteracy rate	
									Female		Male									
	1991	1965 ~80	1980 ~89	1989 ~ 2000	1965	1991	1965	1991	1965	1991	1965	1992	1965	1991	1991	1991	1986	1988	F	M
Pakistan	400	3.1	3.2	3.1	48	41	21	11	45	59	47	59	149	97	139	137	600	270	79	65
India	330	2.3	2.1	1.7	45	30	20	10	44	60	46	60	150	90	125	123	500	-	66	52
Bangla desh	220	2.7	2.6	2.1	47	37	21	14	44	52	45	53	144	103	136	130	600	600	78	65
Sri Lanka	500	1.8	1.5	1.1	33	21	8	6	64	74	63	69	63	18	19	25	90	80	17	12
Nepal	180	2.4	2.6	2.5	46	38	24	13	40	53	41	54	171	101	139	125	-	833	87	74
Bhutan	180	1.6	2.1	2.4	42	39	23	17	40	49	41	47	171	132	200	188	-	1,305	75	62
Thai land	1.570	2.9	1.9	1.3	41	21	10	6	58	72	54	64	88	27	30	40	270	37	10	7
Japan	29,930	1.2	0.6	0.4	19	10	7	7	73	81	68	74	18	5	5	7	15	-	-	-

Note) '-' means unknown

(Source : Health Information, NWFP 1993)

(1) Health Care Services

In order to expand the scope of primary health care services, the Government of Pakistan launched the Basic Health Service System (BHS) in 1977 and is striving to secure such services for its people. In order to provide comprehensive health care services to the communities, the BHS aims to link up city hospitals with communities. The setup for these services is divided up into the following three stages.

Stage 1: Community Health Worker (CHW)

* One man or woman trained in primary health service is dispatched to each community. (He or she receives three to six months BHU staff training).
* He or she carries out simple preventive and curative work.
* Depending on the condition of the patient, he or she refers the patient to the BHU.

Stage 2: Basic Health Unit (BHU)

* One BHU is established to cover an average area of 10,000 people (roughly 64.2km2).
* It is composed of one medical officer and four to six health workers.
* It provides prevention guidance to local residents as well as simple diagnosis and cure work.
* It supplies medicines and medical equipment to the CHWs.

Stage 3: Rural Health Centre (RHC)

* It carries out the planning, control and supervision of the primary health care services.
* By accepting patient referrals from the four to ten BHUs covered by it, it takes charge of some 10,000 local residents.
* It is composed of two male medical officers, one woman medical officer and eight health workers and normally possesses 25 beds.
* It shall be placed under the control of the District Health Officer under provincial government.
* It refers patients to THQ and DHQ hospitals.

Table 2-2 shows those secondary and tertiary care institutions and their functions.

Table 2-2 Secondary and Tertiary Medical Care Institutions and Their Functiones

Medical care institution name	functions	Medical care level
THQ Hospital (Tehsil Headquarter Hospital)	- accept patient referrals from affiliated RHCs. - established to cover some 350,000 to 400,000 residents and carry out health care services. - possess surgical, medical, laboratory, and X-ray facilities. - guidance and supervision of RHC and BHU physicians and health workers; supply of medicine and medical equipment and medical activity support. - refer patients to DHQ hospital.	Secondary medical care
DHQ Hospital (District Headquarter Hospital)	- provide guidance to RHCs through THQ Hospitals. - take charge of health services for around 1.6 million residents. - possess 30 to 100 beds. - possess all major specialities. (Medicine, surgery, obstetrics and gynaecology, paediatrics, ophthalmology, physiotherapy, laboratory, radiology, anaesthesialogy, orthopaedics, psychiatry, dermatology, ENT and dentistry departments).	Tertiary medical care
Teaching Hospital	- in addition to the DHQ hospital's departments, specialized departments. (chest disease, urology, cardiology, nephrology, oncology, nuclear medicine, plastic surgery, neurology and neurosurgery departments). - function as referral hospital for DHQs and lower level bodies. - possess functions as training facility for the 17 medical colleges in the country.	

(Source : The 7th 5 year plan)

(2) Health Administration

Administration of health is mainly under the jurisdiction of the provincial governments. The Ministry of Health of the Federal Government compiles national scale service plans; fosters staff for specialist medical fields; communicates with international health related agencies and helps in the adjustment of any provincial government health service problems.

Health administration is carried out by each Health Department in the provinces, and this includes the drawing up of health care overall plans; the fostering of health workers and the direct control of specialized in hospitals and medical Colleges. Actual health services are controlled and run by the Divisional Director's Office established within each Division and the District Health Officer's Office within each district of the Division.

In particular, the District Health Officer's is in direct control of district health care services starting with its running of primary health care institutions (RHC, BHU and MCH Centre).

(3) Health Workers

Tables 2-3, 2-4 and 2-5 show respectively health worker trends, numbers of medical colleges and number of graduates.

Doctors numbered at one per 2,940 people in 1990. Although compared to the developed countries is a high figure, compares favorably with the situation in Thailand where it is one per 5,000 and Indonesia where it is one per 7,030. However in the case of nurses, the same statistic is only one per 5,040 people which, compared to a figure of one per 550 in Thailand, indicates an overwhelming shortage.

Table 2-3 Number of health staff members (1983 & 1990)

	Doctors	Nurses	LHVs	Para-medicals	population /one doctor	population /one nurse
1983	19,944	7,978	2,562	39,565	4,224	10,559
1990	26,046	7,113	4,350	35,209	2,940	5,040

(Source : 7th plan, MOH, 1988)

Table 2-4 Number of Medical Colleges

Name of institution	location	year of establish-ment	No. of graduate	
			1989	1990
King Edward Medical College	Lahore	1860	256	143
Fatima Jinnah Medical Collgege	Lahore	1948	219	–
Allama Iqbal Medical College	Lahore	1975	355	–
Rawalpindi Medical College	Rawalpindi	1974	210	262
Punjab Medical College	Faisalabad	1974	215	351
Quaid-e-Azam Medical College	Bahawalpur	1971	253	137
Nishter Medical College	Multan	1951	222	190
Army Medical College	Rawalpindi	1977	92	30
Dow Medical College	Karachi	1945	456	430
Sindh Medical College	Karachi	1973	394	348
Liaquat Medical College	Jamshoro	1950	491	251
Chandka Medical College	Larkana	1973	213	–
People's Girls Medical College	Nawabshah	1974	165	196
Khyber Medical College	Peshawar	1955	291	157
Ayub Medical College	Abbottabad	1979	115	107
Bolan Medical College	Quetta	1972	153	110
Aga Khan University Medical College	Karachi		42	89

Table 2-5 Number of graduates

	Number of graduates	
	1989	1990
Doctors	3,341	3,488
Dentists	140	147
Nurses	962	1,137
LHVs	456	348
Midwives	587	304
Dispensers	1,194	860
Medical technician	35	56
Malaria supervisor	6	35
Laboratory technician	83	92

(4) Health Facilities

As stated earlier, health facilities in Pakistan are divided into the primary health care facilities of RHCs, BHUs, MCH Centres and Dispensaries; the secondary medical care facilities of THQ Hospitals, and the tertiary medical care facilities of DHQ Hospitals and Teaching Hospitals.

RHCs are normally set in place for between 40,000 and 100,000 people and they possess one or two male general practitioners, one woman doctor, a medical technician, a malaria technician and an LHV. Each RHC is in charge of four to ten BHUs and possesses ward, delivery and X-ray facilities.

BHUs are allocated with one doctor, a medical technician and so on, and carry out the distribution of medicine and simple disposition work.

THQ hospitals possess facilities for Internal ward of around 100 patients for surgery and medicine, X-ray room and laboratories, however in terms of present functions, some such hospitals are at a level not dissimilar to RHCs.

DHQ hospitals possess facilities for ward of up to 200 patients, and major clinical departments.

Table 2-6 Medical Institutions by Provinces

	Punjab		Sind		N W F P		Balochistan	
	1989	1991	1989	1991	1989	1991	1989	1991
Hospitals	113	225	85	—	86	119	77	58
RHCs	359	283	65	—	68	76	68	39
BHUs	1,811	2,174	320	—	584	722	313	420
MCH Centre & others	1,964	2,390	917	—	447	644	359	524
No. of beds	21,568	31,058	11,265	—	7,615	9,680	2,301	3,589

2-2-2 Outline of Development Projects for the Health Sectors in Pakistan

(1) The Seventh 5 Year Plan

The Seventh 5 Year Plan (hereinafter referred as the 7th Plan) was started by the Government of Pakistan on July 1st, 1988. One of the features of the Seventh Plan was that it attempted to qualitatively improve the public way of life by inviting private sector participation in public investment, and that it attempted to diffuse public works concerning especially education and health throughout all areas of society.

The aims of the health care side of the Seventh Plan can be given as the qualitative improvement of health care; the rectification of urban and rural differences; the supply of health care to the poor; the control of drug abuse; control of tuberculosis patients; the establishment of health and effective emergency medical care services in teaching hospitals; the correction of health care worker imbalances; the introduction of public health insurance and the utilization of private sector.

The development project for health within the Seventh Plan was designed to carry out a national upgrading of the health system in order to further raise the standards which had been achieved under the Sixth Plan. Table 2-7 shows the values achieved under the Fifth and Sixth Plans as well as the target values for the Seventh Plan.

Table 2-7 Achievement of the 5th & the 6th Plans and the Target of the 7th Plan

	The 5th	The 6th	The 7th
	1982	1987-88	1992-93
Infant mortality rate (age 0-1) (/1,000 live births)	98.5	80.0	60.0
Life expectancy at birth (years)	58.6	61.0	63.0
Numbers of doctors (1) urban	18,800	28,800	36,700
Numbers of doctors (2) rural	1,200	8,000	15,000
Numbers of RHCs	298	492	625
Numbers of BHUs	1,693	3,496	5,409
Numbers of dispensaries, MCH Centres/Sub centres	6,490	6,050	6,000

(Source : the 7th Plan)

(Note)

This table only shows numbers of doctors employed by the Government and does not include private or military facility employed doctors.

The concrete policies necessary for the achievement of the objectives of the Seventh Plan, in other words the contents of the Health System are as follows.

1) The enrichment of rural health,
2) The enrichment of urban health,
3) The enrichment of referral functions,
4) The strengthening of preventive medicine, and
5) The execution of a special medical programme.

Item 5) - 'the execution of a special medical programme' includes measures for the supply of school health and dental care services and countermeasures against disease of cardiovascular system, and also entails the fostering of health workers.

(2) Cooperation Results in the Punjab Province

In order to erase urban and rural differences in health care, the Government of Pakistan in 1977 devised the Rural Health Programme and has since promoted the construction of RHCs and BHUs. Moreover in 1985, this programme was included in the Socioeconomic Development Programme as a high priority issue, and a new BHU/RHC Upgrading Project(for the establishment of BHUs and RHCs in 1,312 union councils during 1986-1990) was devised for the purpose of strengthening the working functions of primary health care. The Government of Pakistan requested the procurement of the main items of equipment under this project to Japan. The ensuing 'Punjab Province District Medical Care Upgrading Project' saw the Government of Japan in 1988 provide basic medical equipment such as instrument sets to around 1,900 BHUs, and ambulances, dental units, power generators and instrument sets to around 270 RHCs at a total cost of 780 million Japanese Yen.

However, because at that time as this the Primary Health Care Programme of USAID/UNICEF had been executed in progress, a large degree of overlapping of equipment and projected institutions occurred.

Reasons for the occurrence of this situation are thought to be a lack of consultation with other aid agencies in planning stage.

This project as before, is for the supply of equipment to primary health care facilities, and because similar projects are being carried out by a number of other aid agencies, the executing bodies need to be well aware of the division of projects and must also coordinate in such a way that overlapping does not occur.

2-3 Outline of Related Projects

2-3-1 State Development Programme

The total amount of investment under the Sixth 5 Year Plan (hereinafter referred as the Sixth Plan) was 462.1 billion rupees, and this figure rose by 43% under the Seventh Plan. Within this, the amount of private sector investment rose by 54% showing an increased level of dependence on the private sector. Under the Sixth Plan, the profits made due to the acceleration of private sector investment, improvements in productivity, higher agricultural produce revenues and improved factory productivity rates etc brought about by deregulation were distributed to all people, and policies for low income groups were linked to economic development.

However, although a few of the projects based upon these policies were successful, most of them did not bring about satisfactory results.

The Seventh Plan was designed to take into account the reflection points created by the Sixth Plan. One of the features of the Seventh Plan was that it attempted to qualitatively improve the way of life by inviting private sector participation in public investment, and that it attempted to diffuse public works concerning especially education and health care throughout all areas of society.

The main objectives of the Seventh Plan are as follows.

1) To promote employment (especially for educated people),
2) To enrich public works for all people such as nutrition, evacuation shelters, public health, education and transport,
3) To develop human resources through the promotion of training and education,
4) To gradually reduce dependence on foreign loans and technology and to foster greater independence in all areas of society,
5) To revitalize the private sector through economic deregulation,
6) To restore balance between public financial institutions and remove the disparity between government budget demands and revenue through a revenue budget adjustment program,
7) To rectify the trade imbalance by actively promoting exports, and

8) To continue a tight monetary policy in order to secure stability of prices.

2-3-2 Health Projects in NWFP

(1) SAP (Social Action Programme)

In order to renovate the low level of social reform, the Government of Pakistan started an immediately effective policy possessing in 1992. The areas targeted for improvement under this programme are primary education, primary health care, drinking water supply and sanitation, population welfare and nutrition. Among these, primary education, basic health and drinking water supply are being carried out in each province. The programme will last for six years and is designed to end with the conclusion of the Eighth 5 Year Plan.

In order to ensure the effective execution of SAP, provincial SAP coordination committees, a SAP coordination section within the Planning Environment and Development Department and a SAP cell within the Financial Department have been established. The following is an outline of each area of SAP.

1) Primary Education

i. To universalize primary education by 2000,

ii. To improve the quality of education,

iii. To raise literacy rates among women, and

iv. To put efforts into girls education in order to erase imbalances between the sexes.

2) Rural Water Supply and Sanitation

i. To rehabilitate and expand existing facilities based upon an action plan in order to provide services to those communities, districts and sections of the population not covered working projects,

ii. To enlighten people as to hygienic and safe methods of drinking water,

iii. The treatment of sewerage, and

iv. To ensure the participation of local communities from the beginning in the drinking water plant construction programme in order to transfer responsibility for operation and maintenance.

3) Primary health care

i. To emphasize on preventive as against curative programme,

ii. To improve quality of service and better utilization of existing facilities,

iii. Not to invest heavily in new infrastructure, and

iv. To involve the private sector in health service and community participation.

4) Family planning

The deployment of family welfare workers to the regions is scheduled to begin under the Eighth 5 Year Plan. The ultimate goal of this plan will be to bring the rate of population growth down to 2.6%. These workers will provide education on family planning, distribute contraceptive devices and refer patients to Family Welfare Centres. Service facilities include 240 Family Welfare Centres, 47 Reproductive Health Service Centres, and 3,000 private clinics.

5) General

To raise the qualitative standard of life in general by satisfying the following basic item necessary conditions through investing in human resource development.

i. Literacy,

ii. Supply of health care services,

iii. Supply of drinking water and sanitation, and

iv. Reduction of population growth rate.

Table 2-8 shows the six years projections of SAP in NWFP.

Table 2-8 Projections of SAP

(unit : Rs. in billion)

Sector	Development expenditure	Recurring expenditure	Total	%
1. Primary education	7. 97	14. 169	22. 139	64. 1%
2. Health & nutrition	1. 299	1. 993	3. 292	9. 5%
3. Rural water supply and sanitation	6. 76	2. 304	9. 064	26. 3%
4. Institutional monitoring research	0. 030	–	0. 030	0. 1%

(Source : Social Action Program, Government of Pakistan, 1993)

2-4 Details of the Request

2-4-1 Details of the Request

Since the middle of the 1970s, the Government of the Islamic Republic of Pakistan (hereinafter referred as Pakistan) has strived to develop its system of rural health service. This is reflected in the increased ratio of the development budget being allocated to rural health projects. As a result, the infrastructure of rural health has been markedly expanded. However, due to the qualitative shortage in the supply of equipment and personnel deployment, the health care services still cannot be described as being sufficient. The health policy initiative for 1990 has continued to lay the emphasis on primary health care.

In order to improve this situation, the government of NWFP has compiled the 'Project for the Improvement of Medical Equipment for the North West Frontier Province' which is the subject of this project. The NWFP Government has by its own efforts constructed BHUs and RHCs which act as primary health care institutions and has officially requested Japan is grant aid for the improvement of equipment in those institutions.

2-4-2 Contents of the Request

The official request from the Government of Pakistan is for the procurement of medical equipment in the BHUs and RHCs, or primary health care institutions. 691 BHUs and 74 RHCs are the subject of the official request. Requested equipment can be divided into two levels: that for BHU use and that for RHC use.

BHU equipment includes such items as minor surgical instrument sets, obstetric examining sets, basic investigation equipment, light vehicles (bicycles and motor-cycles) and furniture.

RHC equipment is composed of such items as surgical equipment, obstetric equipment, laboratory equipment, X-ray equipment, dental unit, autopsy equipment, office equipment, vehicles (general communication purpose vehicles and ambulances), ward equipment and furniture.

Table 2-9 shows the main items of requested equipment.

Table 2-9 Major Requested Items

(1) Equipment for BHU

department	major requested items
minor surgery	minor surgery instruments
obstetrics	obstetric instruments set, delivery table
laboratory	laboratory equipment & table
light vehicles	bicycle, motorcycle
furniture	examining couch, office table & chair

(2) Equipment for RHC

department	major requested items
surgery	forceps, operation theatre table, anaesthesia apparatus
obstetrics	delivery forceps, delivery table
laboratory	autoclaves, centrifuges
radiology	X-ray plants, developing system
dental	dental units, instrument sets
autopsy	autopsy instruments
vehicles	ambulances, vehicles
others	typewriter, air conditioners, generators

CHAPTER 3 OUTLINE OF THE PROJECT SITE

CHAPTER 3 OUTLINE OF THE PROJECT SITE

3-1 Overall Outline

North West Frontier Province (hereinafter called NWFP) lies on the border with Afghanistan, and because its districts are divided by numerous valleys and rivers, it is difficult to develop.

As NWFP is province of few urban areas, 85% of its population live in rural village areas. Almost all residents are Pathan. A high percentage of adults flow out into other parts of Pakistan or Middle East countries. As they sent back large degree of money into the province, its level of income is relatively high. Literacy among women in NWFP is very low at 4% and customs such as purdah which segregate women from society exist. Thus it is more difficult to supply health services for women. Table 3-1 shows the NWFP area, population and other indicators of NWFP.

Table 3-1 General Conditions in NWFP

Area	74,500 km^2
Population	17.9 million (1990 estimate, including FATA).
Capital	Peshawar
Language	Official language : Urdu and English Spoken language : Peshtu
Political System	One of the provincial governments which form a federation under a republic system based upon Islamic religion.
Religion	Almost all people are Muslims and there are also a few Christians.
Education	There is no system of compulsory education and literacy is below 30%.

3-2 Natural Conditions

NWFP is the smallest area of Pakistan's four provinces and covers only 9.4% of the national land area. The geography of it is composed of high mountains, plains, dry and barren areas and fertile green areas.

The northern part of the province tends to be mountainous. The districts of Suwat and Kohistan are barren wastelands, whereas Abbottabad and Mansehra are covered with forests. Parts of the other districts of Kohat, Bannu, Nowshera, Swabi and D.I.Khan are hilly areas.

Compared to other areas, these districts often suffer relatively large damage due to such natural disasters as earthquakes, landslips and floods. The Mardan and Peshawar Divisions are covered in fertile alluvial soil carried by the Kabul River which is in stark contrast to D.I.Khan with a dry plain of little rainfall. The northern area has much snow in winter but it is very pleasant in summer.

In the area around Peshawar, it is hot in summer and is cold in winter although rainfall is not so heavy. The hottest and driest time is from June to August and the coldest time is from December to February.

The Chitral Region is an area of heavy snowfall which causes transportation to be cut off during the winter. Landslips in the hilly areas often block roads in the winter and aeroplane flights are said to be often cancelled due to stormy weather.

3-3 Social Environment

NWFP is a male dominated society. Almost all women wear veils and in most cases do such work as cooking, drawing water, milking cows, agricultural work, looking after livestock, sewing and washing.

Education levels of women are slowly increasing.

The people of NWFP are Pathan. Their character is said to be noble, merciful and prudent and they value friendship highly.

Peshtu is the main language although Urdu is also spoken in D.I.Khan, Abbottabad and Mansehla.

3-4 Current State of the Medical Care Sector in NWFP

3-4-1 Health Conditions

NWFP has the lowest ratio of doctors to population (one per 5,547 people) in all Pakistan. And as most of the population lives scattered around in rural areas, health care services do not fully reach them. Infectious diseases like dysentery, measles, tuberculosis and malaria are common, and infrastructure such as water supply, education, health and sanitation facilities are not sufficient. The following section describes the health care conditions in NWFP while at the same time demonstrates its health indicators.

(1) Mortality

Crude mortality has been slowly falling over the past 20 years. This is thought to be due to improvements in the supply of health services, the socioeconomic situation, and the crude birthrate. The shorter life expectancy for women have been managed to catch up that of men in the past 10 years. The infant mortality rate is also showing a slight decline. Table 3-2 displays the major health indicators.

Table 3-2 Major Health Indicates

health indicates	1970	1991
crude death rate / 1000 pop.	19	11
fertility rate	–	5.7
crude birth rate / 1000 pop.	48	41
infant mortality / 1000 live birth	142	97
life expectancy at birth	–	59

(Source : World Development Report 1993)

According to the Pakistan population statistical survey carried out in 1984, the infant mortality rate was 110, however by 1991 this had become 127. This difference comes from different survey methods and does not immediately mean a real increase. The main causes of perinatal death are difficult delivery, poor mother health and tetanus. The main cause of infant death are diarrhea, acute respiratory infections (ARI), malnutrition and infections. According to a Family Health Project staff appraisal report (1991), the mortality rate among children under 5 years in 1988 was 166, however according to a world development report (1993), this rate drops to 138 for 1991. The main causes of death are diarrhea, ARI, malnutrition, other infectious diseases and malaria.

According to the Family Health Project Staff Appraisal Report, the maternal mortality rate was 6 per 1,000 births in 1980 compared to a figure of 2.7 in 1988. The main causes of death are sepsis after abortions, complicated deliveries and puerperel sepsis. They are caused through malnutrition, anemia, iodine deficiency disorders, repeated pregnancies, poor antenatal services, unsupervised deliveries and no post natal care. Socioeconomically they are caused through lack of education, poverty, unhygienic environment and a poor living system.

According to the latest statistics from the Health Department, the 6 biggest causes of death are diarrhea, tetanus, pneumonia (ARI), tuberculosis, causes unknown fevers and hepatitis.

(2) Morbidity

A total of 8.79 million outpatient cases and 640,000 admitted cases were recorded in 1992. The added total of these two figures comes to roughly half the total population of the province. All morbidity is due to infectious diseases, namely diarrhea, malaria, pulmonary tuberculosis, pneumonia (ARI), meningitis. According to a survey of tuberculosis made in NWFP from 1992 to 1993, the annual infection risk is 1.72 and cases of tuberculosis are 94.6 per 100,000 people.

Figure 3-3 shows the 10 main diseases of NWFP.

Table 3-3 Ten Major Diseases

Ranking	Outpatients	Inpatients	Deaths	Inpatients of 1 yr age
1	Diarrhoea	Diarrhoea	Diarrhoea	Diarrhoea
2	PUO	PUO	Tetanus	ARI
3	Malaria	TB	Pneumonia	Malaria
4	TB	Malaria	TB	Meningitis
5	Pneumonia	Pneumonia	PUO	Whooping cough
6	Scabies	Typhoid fever	Diphtheria	Neonatal Tetanus
7	Typhoid fever	Tetanus	Hepatitis	Hepatitis
8	Whooping cough	Diphtheria	Typhoid fever	T.B.
9	Hepatitis	Hepatitis	Malaria	Diphtheria
10	Measles	Measles	Measles	Measles

(Source : Annual Health Returns Statistical Section Health Department, NWFP.)

Note : PUO means Pyrexia of Uncertain Origin and TB Tuberculosis.

(3) State of Nutrition

Like the other provinces in Pakistan, malnutrition is a major health problem in NWFP. In 1991, the Ayub Medical College carried out a survey in the district of Abbottabad in order to get a grasp of nutritional problems. According to results found, 20% of infants are below the average weight of children of the same age and 14.6% of adolescent girls displayed signs of checked development.

In the hilly areas of Hazara and Malakand, iodine deficiency is common, and in some districts, goiter cases are prevalent at 70%. Cretinism is also running at around 10%. These districts have comparatively high rates of psychiatric and maternal and child health problems.

Malnutrition, ARI and diarrhoea linked diseases are the main causes of infant mortality. The poor state of nutrition is due to maldistribution of food, inappropriate weaning and insufficient breast feeding.

As well as this, poverty, large families, poor mother's health during pregnancy and the breast feeding period and the short space between pregnancies all exert a bad effect on the nutritional conditions for mothers and children.

(4) Medical Care Facilities and Workers

The number of doctors and medical workers in NWFP is lower than the national average. It is said that doctors are not present in 20% of the province's BHUs. As was stated in the Seventh Plan, the need for the fostering and securing of doctors in NWFP more so than in other provinces is based upon such evidence. Table 3-4 shows the numbers of health workers in NWFP.

Table 3-4 Health staff of NWFP

		numbers
(1) Doctors	• Male doctors	2,760
	• Female doctors	437
	• Specialist	218
	Total	3,416
(2) Dentists		132
(3) Health staff members	• Pharmacists	14
	• Drug inspectors	17
	• Health educators	6
	• Nurses	917
	• Lady Health visitors	877
	• EPI technicians	649
	• Laboratory technicians	260
	• X-ray technicians	139
	• Dental assistants	112
	• Blood bank technologists	26
	• Anaesthesia techncians	35
	• ECG technicians	26
	• Medical technicians	1,736
	• Dispenser	1,255

(Source : Hand Book on Health Formation, NWFP, January, 1993)

Residents can receive health services from the primary health care institutions of BHUs and RHCs, the secondary medical institutions of THQ hospitals and the tertiary medical institutions of DHQ hospitals and teaching hospitals. Table 3-5 shows institution numbers and Table 3-6 shows those trends for NWFP.

Table 3-5 Numbers of Medical Institutions of NWFP

Medical institutions	No. of instututions	No. of beds	Medical levels
Teaching hospitals	3	2, 808	tertiary
DHQ hospitals	5	1, 848	
THQ hospitals	3	86	secondary
RHCs	76	474	primary
BHUs	677	0	
Dispensaries	427	146	
Leprosy clinic	30	50	
MCH centres	58	2	
T.B. clinics	21	106	
Other institutions	64	3, 849	

(Source : Hand Book on Health formation, NWFP, January, 1993)

Table 3-6 Medical facilities of NWFP, 1988-1992

Medical institutions		1988	1989	1990	1991	1992
Teaching hospitals	A	3	3	3	3	3
	B	2,335	2,335	2,520	2,520	2,920
DHQ hospitals	A	11	11	13	14	23
	B	2,292	2,292	2,838	3,038	4,650
THQ & sub-THQ hospitals	A	16	16	14	33	84
	B	702	702	629	1,702	2,319
RHCs	A	69	71	71	72	78
	B	392	408	408	438	474
BHUs	A	579	679	700	730	772
Dispensaries	A	533	388	582	568	398
	B	326	408	408	438	474
Sub Centres	A	39	39	39	34	28
T.B. clinics	A	16	16	10	18	20
	B	106	106	106	106	290

* A ; Number of institutions
B ; Number of beds

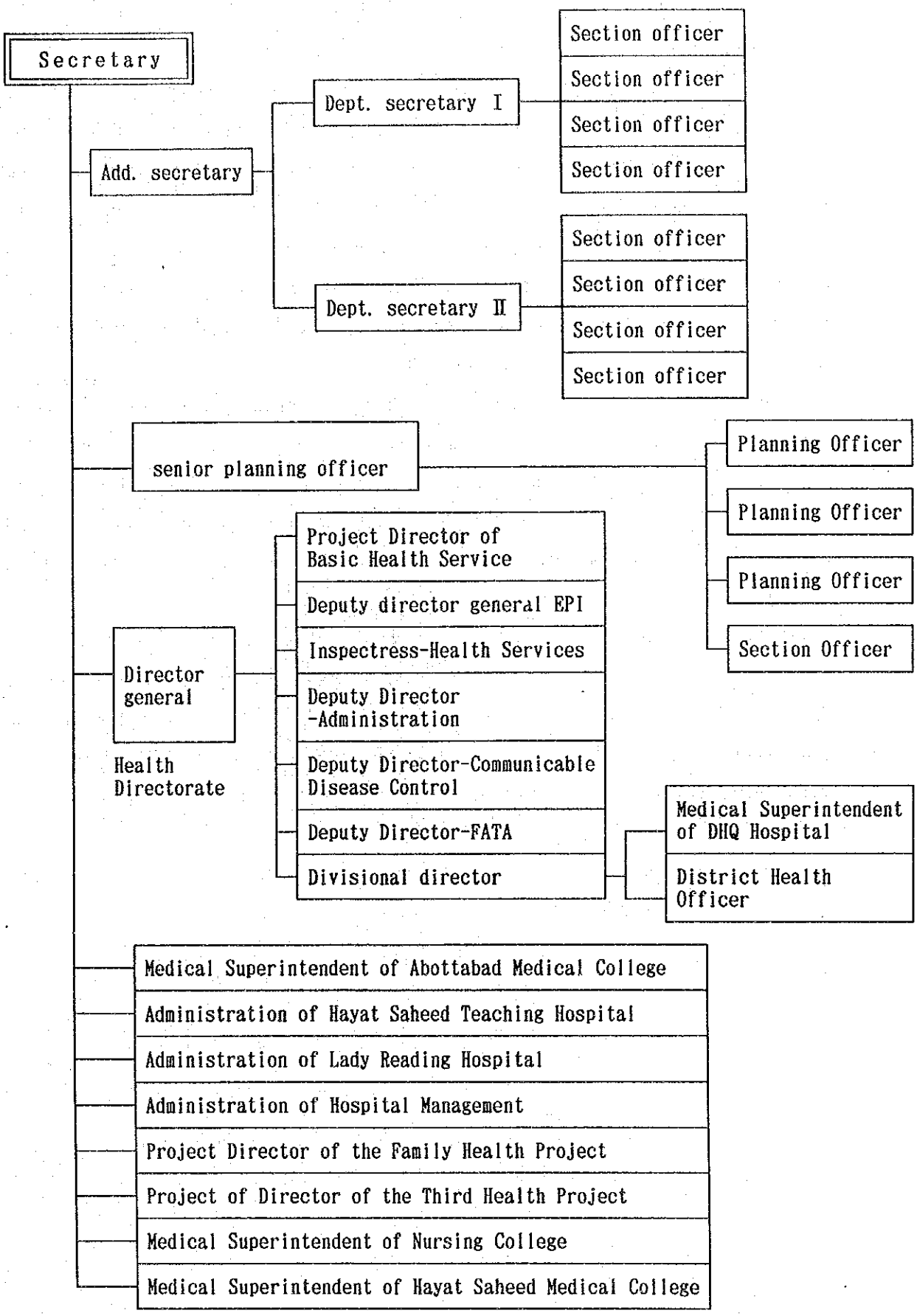
(Source : Data from Health dept. of NWFP)

However, the rates of use of the aforementioned public institutions is only one third of private institutions. In particular, BHUs and RHCs are only used to around half their capacity. It seems that the poor supply of medical equipment and medicine to these institutions is one of the reasons for this.

3-4-2 Health Administration

Provincial Health Department is run by the secretary who is assisted by a secretariat composed of additional secretaries, deputy secretaries, under secretaries and section officers who are in charge of the various functions. This secretariat is responsible for compiling overall health plans and training programmes, control of health administration, the education and training of health workers, and as well as this, they also have direct control over specialized hospitals and medical schools. Furthermore, the Health Department possesses a Directorate of Health Services as an attached department. This directorate carries out supervision and control of all health institutions through a director general at the provincial level; a divisional director at the division level and a district health officer at the district level. Figure 3-1 displays the organization of the NWFP Health Department.

Fig. 3-1 Organization of health department of NWFP



3-4-3 History and Current Situation of RHCs and BHUs

(1) History of RHCs and BHUs

In 1977 the Government of Pakistan began the work on constructing its Basic Health Service System with the help of grant aid from the United States Agency for International Development (USAID) and technical cooperation from the University of Hawai and so on. The aim of this service system is to provide comprehensive and preventive health services to local communities and to link these communities to the modern hospitals in the urban areas. This service system is composed of Community Health Workers at the first stage, BHUs at the second stage and RHCs at the third stage.

Previously in the subject area, primary health care services were provided by sub centres, dispensaries and civil hospitals, however in order to renovate and expand these health care institutions in line with the new service system, the Government of NWFP has reorganized them into RHCs and BHUs and is striving to improve their services. However the reorganization work in the subject area has yet to be completed.

At the time Japan received the official request from the Government of Pakistan in 1990, there were 691 BHUs and 74 RHCs, however as of January 1, 1993, this had risen to 722 and 76 respectively. On consulting with NWFP, the study team confirmed the numbers as all the BHUs, except in FATA, where the study team could confirm their equipment and 74 RHCs according to the request.

Table 3-7 shows the district separate distribution of the 74 RHCs and BHUs which are the projected institutions.

Table 3-7 District wise RHCs

DIVISION	DISTRICT	NAME OF RHCs
Peshawar	Peshawar	Gara Tajik.
		Nahaqi.
	Charsadda	Batagram
		Jamalabad.
		Sherpao
	Nowshera	Akora Khattak.
		Dak Ismail Khel
		Khair Abad
		Kheshki.
		Manki Sherif.
		Pir Pai.
Mardan	Mardan	Gumbat
		Katlang
		Shahbaz Garhi.
		Takht Bhahi.
	Swabi	Ambar Kunda
		Yer Hussain.
Kohat	Kohat	Chorlaki
		Gumbat
		Lachi
		Naryab
		Usterzai.
	karak	Nari Panus
		Latember
		Sabir abad.
		Ahmed Khel

DIVISION	DISTRICT	NAME OF RHCs
D.I. Khan	Bannu	Domel
		Kakki
	D.I. Khan	Pahar Pur
		Paroa
		Siddalian At Kotjai
		Kirri Shamozai
	Tank	Ama Khel
		Gomal Bazar
		Gul Imam
	Lakki Marwat	Landiwash
		Tajori
		Titter Khel
		Gambila
Hazara.	Abbottabad	Havelian
		Kalpani
		Lora
		Moribaddben
	Haripur	Ghazi
		Khanpur
		Kot Najibullah
		Serai Niamat Khan
		Seri Kot
	Kohistan	Dassu
		Pattan
	Mansehra.	Bannu
		Chattar Plan
		Chowki
		Kawai
		Khawari

DIVISION	DISTRICT	NAME OF RHCs
		Lessan Nawab Sahib
		Oghi
		Suchan Kalan
		Shinkiari
Malakand	Malakand Agency	Dheri Julagram
		Skhakot
	Buner	Jawar
	Chitral	Ayun
		Kaghuzai
		Mastuj
	Dir	Barawal Banda
		Munda
		Gul Abad
		Lal Qila
		Ziarat Talash
		Warai
	Swat	Khazana
		Chuprial

Table 3-8 District wise numbers of BHUs

DIVISION	DISTRICT	Number of BHUs
Peshawar	Peshawar	43
	Charsadda	32
	Nowshera	25
Mardan	Mardan	40
	Swabi	34
Kohat	Kohat	31
	karak	20
D.I. Khan	Bannu	9
	D.I. Khan	34
	Tank.	13
	Lakki Marwat	34
Hazara	Abbottabad	49
	Haripur	36
	Kohistan	24
	Mansehra	82
Malakand	Malakand Agency	20
	Buner	19
	Chitrai	16
	Dir	63
	Swat	53

(2) Organization

Figures 3-2 and 3-3 show the standard organizations of the RHCs and BHUs.

Fig. 3-2 Standard Organization of RHC

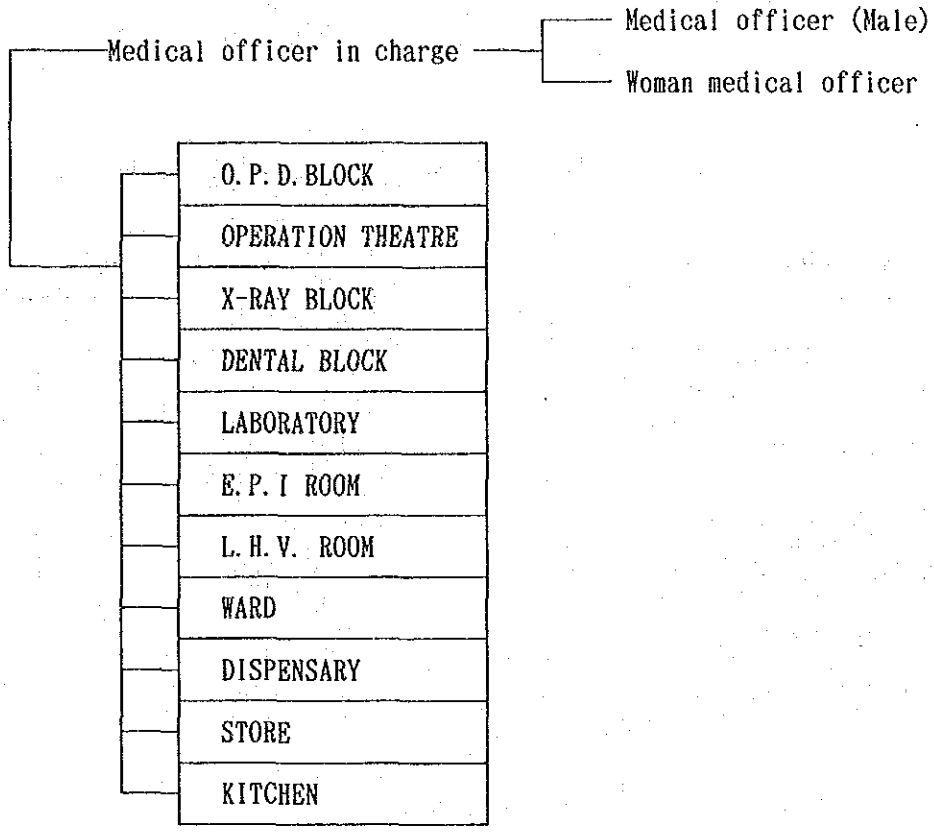
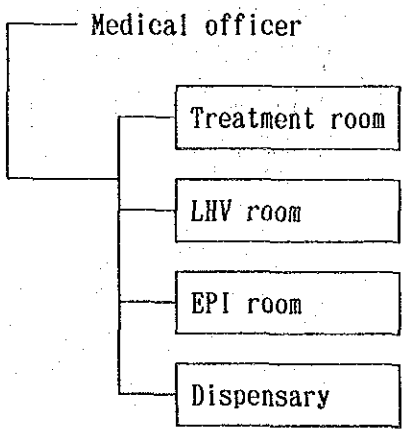


Fig. 3-3 Standard Organization of BHU



(3) Personnel Deployment

Figures 3-9 and 3-10 show the standard deployments of personnel in the RHCs and BHUs.

Table 3-9 Standard manpower allocation of RHC

① Medical staff members

Medical Officer	2
Woman Medical Officer	1
Medical Technician	3
Lady Health Visitor	1
Midwife / Trained TBA	1
E. P. I. Technician	1
Laboratory Assistant	1

② Service staff members

Chaukidar	1
Cook	1
Mali	1
Bishti	1
Sweeper	1

Table 3-10 Standard manpower allocation of BHU

① Medical staff members

Medical Officer	1
Medical Technician	2
Lady Health Visitor	1
Trained TBA	1

② Service staff members

Chaukidar	1
Bishti or attendant	1

(4) Functions

According to the Health Department, the following are the functions which the RHCs and BHUs were designed to carry out.

1) BHU

1. Primary health care service to 2 or more communities,
2. Immunization to all infants under 1 year,
3. Antenatal care and delivery assistance to all pregnant women by a trained personnel,
4. Immunization against tetanus to all women of child bearing age,
5. Promotion of breast feeding and provision of advice on infant nurture,
6. Growth monitoring of children under 5 years old,
7. To provide health care and essential drug to all,
8. To carry out malaria control and tuberculosis control, and
9. Training for TBAs.

2) RHC

1. Primary health care services to the subject area,
2. To act as the referral center for BHUs in subject area,
3. To oversee the activities of the BHUs,
4. To perform malaria control, and
5. To act as a training centre for community health workers.

(5) Current Activity Contents

The main functions of the BHUs are the supply of primary health care and also maternal and child health care services. First-aid treatment for small wounds and the supply of essential drug are included. Cases requiring further treatment are referred according to the symptoms, to DHQ hospitals which possess specialist doctors. On the preventive side, EPI rooms are established and EPI technicians work for vaccinations by using UNICEF supplied vaccines, syringes and steam sterilizers. In terms of equipment, almost all BHUs possess vaccine refrigerators and power generators. Regarding the discovery of malaria and tuberculosis patients, many BHUs are unable to carry this out due to the fact they do not have microscopes.

As for maternal and child health care services, almost all deliveries are done in homes attended by LHVs or TBAs. LHVs also carry out training for TBAs in communities and use the BHUs as their bases.

RHCs have in addition to the same functions as the BHUs, radiology diagnosis, vaccinations, dental units, delivery rooms (with LHVs), laboratory and wards. X-ray photoes are taken in a facility called X-ray block, and are used for diagnosis of tuberculosis, pneumonia and other respiratory system diseases and also bones fractures.

Dental units possess a dental surgeon and mainly carry out such dispositions as plaque removal, treatment of gingivitis, and tooth extractions. However, due to shortages in the supply of cement and amalgam, filling treatment of cavities is hardly carried out so much.

In NWFP which is conservative, only women medical officers are in charge of obstetrics and gynecology departments. Over 95% of deliveries are carried out in homes with the aid of TBAs meaning deliveries in BHUs and RHCs are very few indeed. As well as being responsible for maternal and child health care services and family planning, LHVs also carry out training for TBAs.

Regarding laboratory, medical technicians perform screening of malaria and tuberculosis as well as carry out blood and urine check. Wards are divided into men's and women's and in all possess about 10 to 20 beds. Admitted patients tend to increase during the summer season when infections become more widespread, although the normal number is few at less than 20 per month. Many such cases are of cause unknown fevers and gastrointestinal infections. The most common cases of surgery are abscess openings, wound sutures, bone fracture dispositions, circumcisions and other cases of minor surgery. The operation theaters do not possess the anaesthesia apparatus and blood transfusion apparatus necessary for laparotomies and such cases are referred to DHQ hospitals and so on which possess specialist doctors. Table 3-11 shows the trends in patient numbers in the BHUs and RHCs. This table indicates that the number of BHU and RHC patients are increasing at an annual rate of 3 to 4%.

Table 3-11 Numbers of Patient of BHUs & RHCs

	1988	1989	1990	1991	1992
RHCs	531,047	539,012	551,409	568,702	592,579
BHUs	1,436,391	1,457,936	1,491,468	1,537,703	1,602,286

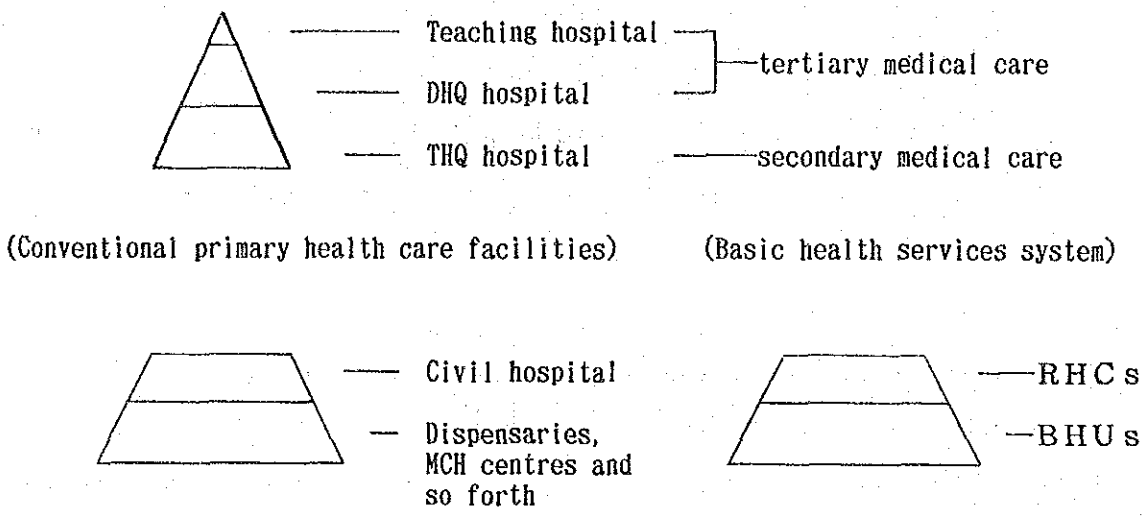
(Source : Data from statistic section of health dept. of NWFP)

3-4-4 Current Situation of the Referral System in the Medical Care Institutions

The referral system in the subject area combines both the system that was in use before the introduction of the Basic Health Services System and the system in use since the introduction. The Health Department, on taking access to BHUs and RHCs into account, wants to establish 1 RHC for every 5 BHUs, however in the current situation 1 RHC is responsible for overseeing 10 BHUs. RHC functions are insufficient compared to what they were originally designed to be and due to the fact that transportation from RHCs to the higher level THQ and DHQ hospitals is non-existent the referral system is not functioning very well. In order to improve on this situation, the Health Department is not building new RHCs but instead is converting civil hospitals at the sub-THQ hospital level into RHCs. Health policy states that THQ hospitals should possess the 4 clinical departments of obstetrics and gynecology, paediatrics, surgery and internal medicine, however the state of necessary equipment in the THQ hospitals in the subject area are not satisfactory and the annual development plans are striving to improve this situation.

Figure 3-4 shows the position of each medical care institution in NWFP.

Fig. 3-4 Positioning of Medical Institutions of NWFP



As to the difference between civil hospitals and RHCs, the Health Department explains that the functions of civil hospitals are limited to the acceptance and examination of patients only whereas the RHCs also possess the function of health education activities through their LHVs and so on. The state of facilities in the civil hospitals varies and some are indeed at the level of the THQ hospitals. However it is thought that all will be converted into THQ hospitals or RHCs.

3-4-5 Health Development Plans

(1) Family Health Project

This project has been commenced for a scheduled period of 7 years (1992-1998) financed by the World Bank, technically cooperated by the British ODA and the SCF (Save the Children Fund: an international non-governmental aid organization).

The objectives of the project are as follows.

1. To improve the health status of the population of NWFP,
2. To increase the effectiveness of the existing health care net work, and
3. To build the institutional capacity to achieve these objectives.

The main components of the project are as follows.

1. The strengthening of health services in the areas of maternal and child health, family planning and communicable disease control,
2. The development of staff meaning the increase of female paramedical staff and the improvement of staff capabilities and performances, and
3. The development of management and organization focussing on improved management capabilities.

This project is divided into the following 3 departments.

1. The Project Implementation Unit (PIU) is responsible for overall execution of the project including operation of funds, all construction work and the purchase of equipment and furniture. A steering committee has been organized in order to provide guidance on project execution. A planning and monitoring section carries out detailed studies into project execution.
2. Provincial and district health development centers are in charge of the development of training packages for all current health workers in the fields of management, supervision, family planning, immunization, TBA training. Health management information systems have been implemented in 2 divisions so far and the Provincial Health Development Center is planning their implementation in for the other divisions.
3. The departments responsible for provincial and district public health and nutrition carry out the policies for public health and nutrition which have been devised by the Provincial Health Development Center and the Provincial Government as policies of national public health and nutrition education.

(2) The Third Health Project

The present project was originally scheduled to finish after 5 years (1989-1993), however due to delays in execution, this has been extended for another 2 years. This project receives technical support from the Government of Pakistan and the Overseas Development Administration (ODA) of Great Britain and funding from the Asian Development Bank (ADB). The following is an outline of the Third Health Project.

1) Upgrading of Primary Health Care Institutions

1. The renovation of 68 RHCs and the upgrading of 14 lower level institutions to RHC status,
2. The construction of and supply of equipment, to 6 BHUs in the FATA (Federally Administered Tribal Areas), and
3. The construction of 43 residential facilities for doctors and health workers.

2) Upgrading of Tertiary Medical Care Institutions

1. The improvement of training institutions through the construction of buildings, educational aid and supply of equipment and furniture to Khyber Teaching Hospital, Lady Reading Hospital and Peshawar Public Health School as well as the supply of consulting services and fellowships to teachers in nursing schools, and
2. The supply of consulting services for clinical training.

3) The construction of electronic medical equipment repair and maintenance workshop and the supply of equipment and consulting services.

4) The improvement of planning and control capacity.

The improvement of the planning unit within the Health Department through the granting of staff fellowships.

(3) Fourth Health Project

This project, sponsored by the ADB has come into effect recently. It will be executed for a period of 6 years (1993-1999) and 77.5% of its total cost is being financed by the ADB. The overall objective of the project is to improve the quality of the health service by integrating primary medical care institutions.

The main goals of the project are as follows.

1. To improve the quality of training for health workers,
2. To support health education and the Expanded Programme on Immunization (EPI), and
3. To strengthen the referral system by raising the status of institutions and the medical care services of hospitals.

The range of the project within North West Frontier Provinces as follows.

1. The establishment of 3 new nursing and paramedical training institutions and the improvement of 2 existing paramedical schools,
2. The establishment of a human resource development unit at Peshawar, and The main emphasis is on preservice training and the improvement of human resources situation.

3-4-6 Current Situation and Problems in Equipment Maintenance

Whenever breakdowns of equipment occur in BHUs and RHCs, the medical officer in charge notifies the district health officer. In the event of breakdown of comparatively large equipment such as X-ray apparatus and dental units, the equipment agent is contacted and an engineer is called to carry out repair and inspection. For other simple equipment,it is taken to a private workshop in the district for repair work.

One of the problems regarding maintenance is that in the case where replacement parts or consumables are very costly as with X-ray equipment, dental units and spectrophotometers, budgetary constraints make their procurement difficult. These equipment agents normally possess a maintenance service engineer and it is possible to purchase replacement parts within NWFP, however because maintenance check service rates are expensive, maintenance checks are not carried out much apart from breakdown times. Moreover, the control of expendable items for spectrophotometers which require large quantities of consumables such as reagents, is not complete and there are often situations where one RHC may have more than enough and other RHCs may be facing supply back logs of 6 months. The supply of consumables in the subject districts is the responsibility of the district health officers, and supplies are carried out twice a year in June and December. In order to improve these problem areas in terms of maintenance, the Health Department has decided to construct 1 central workshop in Peshawar and 3 sub-workshops in each of 3 other districts as medical equipment maintenance institutions under the Third Health Project. The central workshop within the Khyber Teaching Hospital in Peshawar is currently under operation.

Regarding this central workshop, as was stated in the previous section on the Third Health Project, because it has only been in existence for 6 months (as of

November, 1993), it is yet to become well known and maintenance cases have only reached 19 which indicates a low operating rate.

Figure 3-5 illustrates the current personnel and organization of the central workshop.

Fig. 3-5 Organization Chart of Central Workshop

- Electronic Technician 2
  - one amongst the above 2 is a group leader
- Electric Technician 2
- A/C Technician 1
- Mechanic 1

The current location of the central workshop is only temporary and under the Third Health Project, it is scheduled to be transferred to the Hayatabad Medical Complex in Peshawar and also receive increased personnel under the personnel deployment plan. According to the group leader of the central workshop, the main maintenance problems are that it can sometimes take from 6 months to a year to procure certain spare parts, and that in the case of high level equipment such as ultrasonic diagnosis apparatus, repair work is not possible due to the inability to obtain circuit diagrams. The reason why it is so difficult to obtain circuit diagrams is because the local agents are unwilling to provide them in order to secure more profit from the repair and inspection services they provide themselves. This means that if the electronic circuit diagrams were available, the workshop technicians would be able to detect the broken down areas on printed circuit boards and be able to handle any normally thinkable breakdown because necessary repair instruments including oscilloscopes and tester devices have already been procured. Table 3-12 shows the existing repair equipment and instruments.

Table 3-12 Existing Equipment List of Central Workshop

Existing equipment	facility	Existing equipment	facility
Oscilloscope	1	Digital multimeter	1
Soldering iron	1	Test lead	1
Plier	1	Proto type board	1
Thermo couple type air temp. probe	1	Electric saw	1
Ring spanner	1	Coil rewinder	1
tools set	1 set	Driller (manual) multimeter	1
Soldering sucker	1	Extension plug	1
Scruee driver	2 sets	Centre punch	1
Extension cord	1	Logic probe	2

3-4-7 Development and Operating Expenditure in NWFP

(1) ADP (See Table 3-13.)

ADP is composed of plans for rural health services. general hospitals, teaching hospitals, Hayat Saheed teaching hospital, medical educational training, scholarship & stipends, prevention schene and Hayatabad medical complex. (See Table 3-13 ADP.)

Rural health services include projects on the provincial and the district levels. Provincial level projects are the Third Project, the Family Health Project, the salaries of staff in the Basic Health Service and the World Food Programme. Between 1992 and 1993 these projects were allocated 11.2% of the district health service budget. District level projects include the construction of new BHUs and RHCs and also the improvement and renovation of existing BHUs and RHCs. According to the Secretary of the Health Department, development expenditure will be checked by transforming existing civil hospitals into RHCs instead of constructing new RHCs.

The prevention project includes the Expanded Programme on Immunization (staff salaries), the purchase of oral hydration salts, health education (staff salaries), nutrition projects and the establishment of a public health association.

The construction of DHQ and THQ hospitals accounts for most of the annual development expenditure. This is due to the fact that new districts and towns (Teshil) have been established recently. Moreover, construction of DHQ hospitals has been commenced in each district headquarter. The share allocated to rural health services is slowly decreasing.

Priority is being given to the construction of 2 tertiary medical care hospitals in Peshawar and this is continuing to receive a 9% share of annual development expenditure per year.

Medical education and training is allocated around 7% and most if this is being used for the construction of a medical school and a dental school in Peshawar. Furthermore, the federal government is directly funding the construction of the Ayub Medical College.

As can be gathered from the above, NWFP is attempting to improve its serious shortage of health workers, as was stated in the Seventh Plan by means of hastening with the fostering of doctors and health workers and the construction of educational medical institutions.

Moreover, because the construction and expansion of BHUs and RHCs has received priority in recent years, one can also understand the desire to enable easier access for local residents to secondary and tertiary medical care through the construction and expansion of THQ and DHQ hospitals. It can be said that these are in line with the development plans for the said province like the Family Health Project etc.

Table 3-13 displays the breakdown of expenditures for the period from 1989 to 1994.

Table 3-13 A D P

(unit : Rs. in million)

Sectors	1989-90	1990-91	1991-92	1992-93	1993-94
Rural health services	140.0	123.3	133.2	136.7	106.4
General hospitals	82.0	109.2	169.2	242.9	204.1
Teaching hospitals	(Postgraduate medical institute & Rady Reading hospital)				
	21.3	31.5	29.9	30.6	26.7
Hayat Saheed teaching hospital	4.5	7.9	2.4	10.0	8.1
Medical educational training	8.6	9.7	10.0	6.1	12.5
Scholarship & stipends	17.6	17.6	19.6	22.6	23.3
Prevention scheme	33.6	33.5	45.7	42.5	37.4
Hayatabad medical complex	17.6	41.2	37.3	6.3	15.2
T o t a l	326.0	374.0	448.1	498.0	433.9

(Source : Annual development plan of NWFP)

(2) Recurrent Expenditure

As with annual development expenditure, recurrent expenditure is also showing a gradual increase. Funding for the health sector comes from collections of 1 rupee from OPD case, 5 rupees from indoor patients and income from private beds and laboratory examinations. However compared with other sectors, it is still extremely small.

Revenue for 1992-93 was 27.9 million rupees and the revenue forecast for 1993-94 is 30 million rupees which amounts to 2.67% of the Health Department's total income.

57% of expenditure is allocated to salaries and benefits and 36% is used to buy items. Judging from this, the amount allocated to maintenance costs is small.

Tables 3-14 and 3-15 show the trends for recurrent expenditures and maintenance costs of the Health Department.

Table 3-14 Annual Recurrent Expenditures of the health department

(Rs. in million)

Fiscal years	Expenditures	Increasing ratio %
1988-89	600. 136	3. 3
1989-90	625. 00	4. 1
1990-91	727. 00	16. 3
1991-92	900. 00	23. 8
1992-93	1, 021. 693	13. 5

(Source : Recurrent expenditures of NWFP)

Table 3-15 Annual Maintenance Cost of the health department

(Rs. in million)

Fiscal year	Maintenance cost	Increasing ratio %
1988-89	27. 83	4. 1
1989-90	30. 09	4. 0
1990-91	35. 2	4. 1
1991-92	36. 46	3. 6
1992-93	38. 76	3. 3

(Source : Recurrent expenditures of NWFP)

CHAPTER 4 PROJECT CONTENTS

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4-1 Project Aim

The Government of Pakistan has taken up the upgrading of primary health care within its National Development Plan. In response to this, the NWFP compiled this project with the object of rectifying the current regional differences and improving the treatment functions of its primary health care institutions. This project aims to improve the level and quality of health care services for the residents of the subject area by upgrading the equipment of the RHCs and BHUs which act as primary health care institutions.

4-2 Review of the Request

4-2-1 Review of Project Appropriateness and Necessity

The Government of Pakistan has shown its awareness of the fact that numerous problems exist in the supply of health care services under the execution of the Sixth and Seventh Plans, and has set forth a series of counter measures. The new health policies announced in the Seventh Plan stress the importance of satisfying the demand for medical care from poverty groups and of upgrading the primary health service system. As is stated in the Seventh Plan, the level of the health fields in NWFP is low compared to the other provinces. Moreover, more than 85% of the residents of the said province live scattered around rural areas.

The health care facilities most used by the residents of the rural areas are the RHCs and BHUs. Through upgrading the medical equipment in these institutions and procuring vehicles for the conveyance of patients, as well as raising treatment functions, it will be possible to link these rural health care institutions with the secondary and tertiary level institutions in the cities.

The execution of this project is expected to rectify the regional and institution differences in the subject area and as a result, bring down morbidity and mortality rates of the residents. This supports the Social Action Programme (SAP) being promoted as a high priority policy by the Government of Pakistan and

coincides completely with the health goals of the National Development Plan. Moreover, because sufficient effects can be expected from this, it is possible to say that the project possesses high levels of necessity and appropriateness.

4-2-2 Review of Project Execution and Management

Execution of this project will basically cause no changes in the numbers and ranks of subject institution personnel. However concerning departments under this project which until now have been insufficient, personnel increases will be made under the Health Department annual development plan.

The increases in personnel break down to be 33 X-ray technicians to operate X-ray plants and 69 drivers for ambulances. These personnel shall be allocated based upon RHC standard organization and personnel deployment and the budgetary measures and appointments are expected to be carried out in the course of execution of this project.

4-2-3 Relationship with the World Bank Project

As was stated earlier, the World Bank is currently executing the Family Health Project and because much of this and our project overlap, a study team held consultations concerning the overlapping areas. On receipt of the decision from the federal government that Japanese grant aid would be given the utmost priority, the NWFP Government requested procurement according to the original request for the project. The following are the results of adjustments made for each item of equipment.

(1) Ambulances

Of the 6 RHC ambulances that are overlapping, one has already been procured by the NWFP Government. Consequently, the NWFP Government has stated that it wants the 5 remaining overlapping ambulances as well as the other 64 to be procured under this project. As a result, review into the possibility of procuring 69 ambulances for RHC use is being carried out.

(2) Microscopes

The World Bank is planning for the procurement of 330 microscopes for BHU and RHC use. Of these, 74 RHC microscopes overlap with this project. The World Bank side will decide on the specifications and quantity of microscopes after employing a local consultant to carry out an investigation, and as yet, nothing concrete has been settled. The study team review the possibility of procurement of the 74 RHC microscopes.

(3) BHU Basic Instrument Sets

The World Bank is planning to fund the procurement of basic instrument sets in 480 BHUs and MCH centres in NWFP. The specifications of equipment and distribution destinations have as yet not been settled. Consequently, the study team will review the possibility of basic instrument sets for existing BHUs in NWFP.

4-2-4 Relationship with ADB Projects

The ADB was planning in the previously stated Third Health Project, to construct X-ray blocks in 61 of the 68 RHCs and also fund to procure X-ray plants.

However compared with 1987 when the project was devised, the Bank claims that the price of an X-ray plant has increased by five times. As a result, the procurement of the originally planned X-ray plants has become virtually impossible. The project director for the Third Health Project in compliance with the request of the Health Department, has made a report of the fund deficiency situation to the headquarters of the ADB in Manila and at the same time, presented a letter to the Health Department stating that it would be possible to procure 15 sets of X-ray plants.

Consequently, the study team has decided to examine the feasibility of the procurement of the X-ray plants which has become impossible to procure under the above project, based upon the request of the Health Department.

4-2-5 Relationship with UNICEF

UNICEF has had an office established in Peshawar since 1981. The health field activity of UNICEF in NWFP is the expansion of preventive services.

In specific terms, it establishes MCH centres inside RHCs and BHUs and supplies TBA kits and medicine. Moreover under the EPI, it is continuing to carry out the supply of syringes, boiling sterilizers, refrigerators, power generators, vaccines and other items necessary for immunizations. It is also carrying out the supply of educational instruments and oral rehydration salts (ORS) in order to spread the use of oral rehydration treatment (ORT) for diarrhea.

As was explained to the study team by Dr. Ahad of the Peshawar office, the policy of UNICEF is to improve preventive services which from the point of view of cost performance are of low cost and also effective, rather than to establish high running cost hospitals.

As a result, apart from the equipment necessary for the above mentioned services, the Peshawar office does not procure medical equipment and consequently does not overlap with this project.

4-2-6 Relationship with WHO

WHO provides funds for numerous small-scale technical cooperation and training activities. Regarding projects related to primary health care, it carried out primary health care training for health workers from 1991 to 1992.

Consequently there are no overlapping areas of importance with this project.

4-2-7 Relationship with other aid agencies

As for other aid projects, the Italian Cooperation for Development (ICD) is carrying out health related aid activities in NWFP. ICD which until now has promoted tuberculosis control projects for refugees from Afghanistan is about to expand this project subject area to include NWFP.

The project includes the supply of microscopes, training in medical technicians (microscopists) and medicine. So far it has already supplied microscopes to 7 RHCs in the Peshawar district. ICD held discussions with the secretary of the Health Department on the question of expanding this to other districts in the province, but was unable to reach an agreement. On outlining this in an interview with Dr. Georgio who is in charge of the said project, he stated that because 31 RHCs overlap with the World Bank project, ICD would suspend that area and change over to the supply of medicine.

4-2-8 Study of Existing RHC, and BHU Equipment

(1) BHU Equipment

In order to make a study of the number of BHUs in the province and the operating conditions of their existing equipment, questionnaires concerning the following 4 basic items of equipment were distributed to each district health officer from the Health Department, and the collected replies are compiled in annex 8.

Excluding the 2 districts from which no reply was received, 663 BHUs were found to be in 15 districts in 6 divisions. The subject of the study were the following 4 items of equipment which BHUs are regarded as possessing.

1. Diagnostic instrument set,
2. Sphygmomanometer,
3. Weighing scale for infant, and
4. Boiling sterilizer.

(2) RHC Equipment

On the request of the study team, the JICA Pakistan office employed a consultant to make a study of the operating conditions of existing equipment in RHCs. The subject of the study was the following 6 items of equipment. The results and a comprehensive table of the study is shown in annex 9.

1. Anaesthesia apparatus,
2. Boiling sterilizer,
3. Delivery table,
4. Glucosemeter,
5. Centrifuge, and
6. Microscope.

However, of this equipment, anaesthesia apparatus is currently in use in two RHCs which are not included as subjects of this project. They are therefore excluded from the comprehensive table. Similarly, because no RHC was found to possess a glucosemeter, they have been excluded as well.

4-2-9 Review of Subject Institution Contents

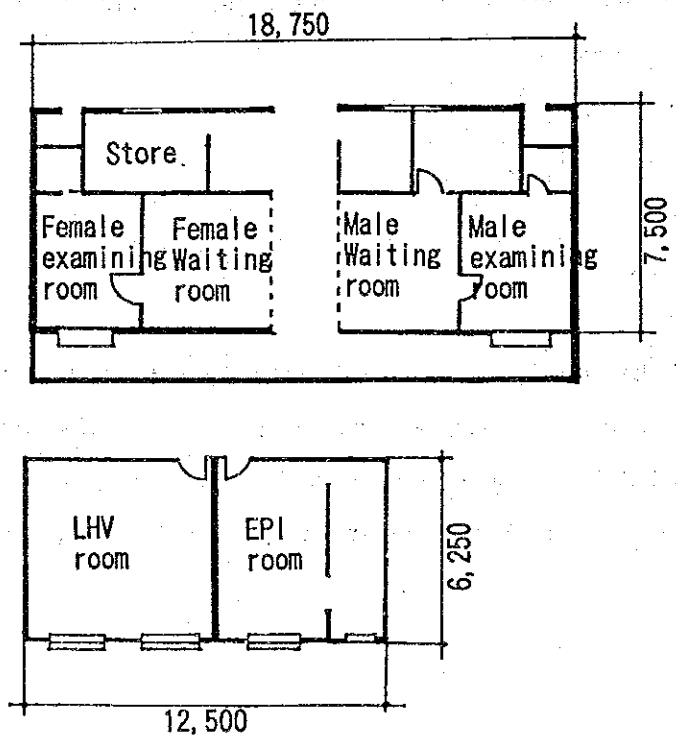
The BHU and RHC buildings are basically in a pavilion style with department buildings in sprawl. The results of review of the contents of the subject institutions are as follows.

(1) BHU

BHUs are composed of only an outpatients block which contains an LHV room, an outpatients examination room, an MCH centre and an EPI room. Some BHUs are divided into 2 blocks. The equipment subject to review under this project consists of outpatient use diagnostic instrument sets, examination tables, boiling sterilizers and disposition instrument sets which will be placed in the outpatients examination rooms.

Gynecology department examination instrument sets and weight scales are to be placed in LHV rooms. None of this equipment requires installation and each room has enough space, so it can be said that there will be no problems in terms of facilities. Figure 4-1 shows a typical layout plan of a BHU.

Fig. 4-1 Typical Layout Plan of a BHU



(2) RHC

An RHC is divided into an OPD block, an X-ray block, a dental block, a ward, a kitchen and a mortuary. As well as this, each OPD block contains a medical officer examination room, a woman medical officer examination room, an LHV room, a laboratory, a dispensary and an EPI room and so on. X-ray blocks and dental blocks are independent. X-ray blocks contain an X-ray room, a dark room and a doctor and an X-ray technician office. Dental blocks are composed of a disposition room, a dental surgeon office and a waiting room. Figure 4-2 shows a typical Layout plan of an RHC.

The deployment plan of equipment to each facility is as follows.

a. Medical officer outpatient examination room:

minor surgery instruments set, boiling sterilizer and examination instruments set etc.

b. Woman medical officer examination room:

delivery table and obstetrics examination equipment etc.

c. Operating theater:

autoclaves, operating table, surgical forceps etc.

d. Wards:

ward equipment such as bedpans.

e. Laboratory:

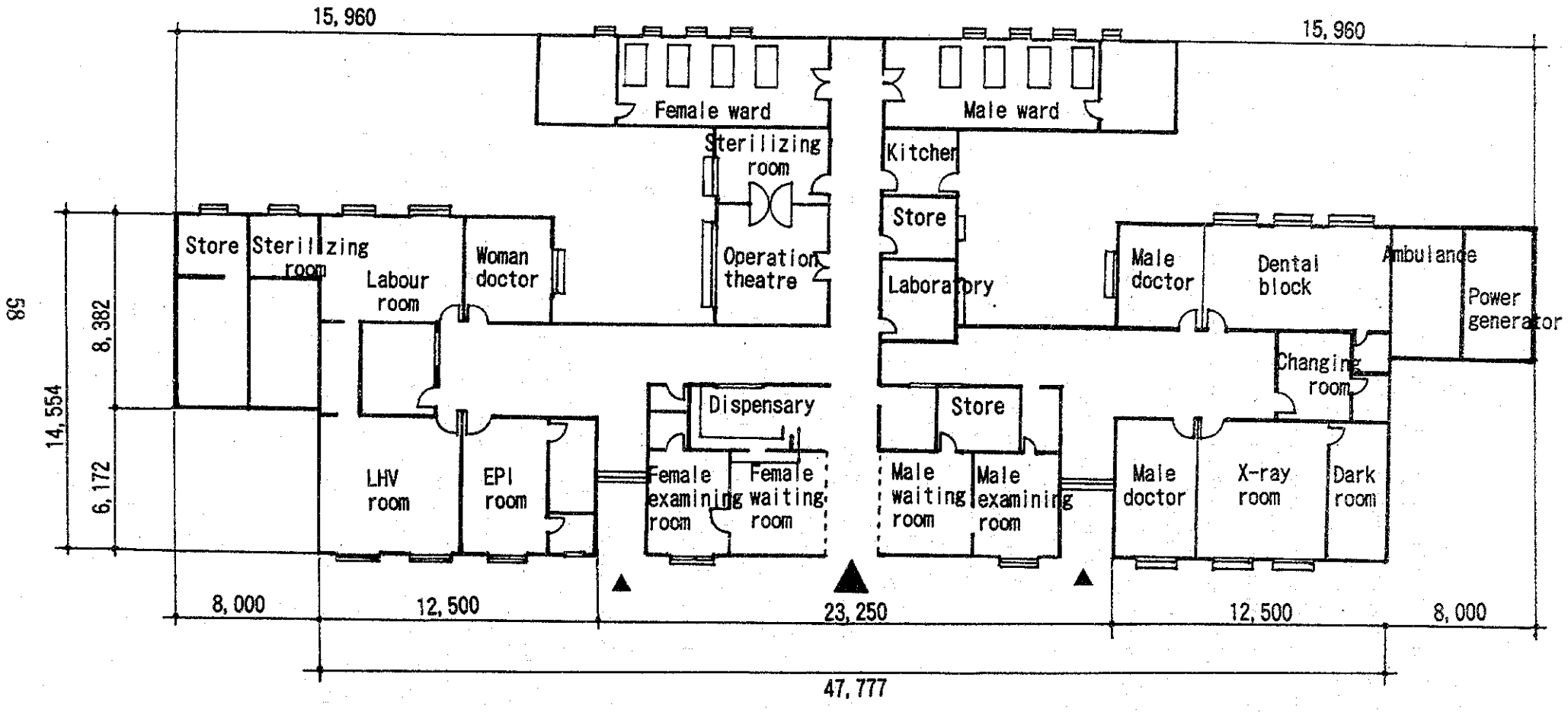
boiling sterilizers, microscopes and glass instruments etc.

f. X-ray block:

X-ray plant, developing system and X-ray film illuminator.

Excluding those X-ray blocks that will be newly constructed, this is a renewal of equipment which means that it is safe to think that the conditions for acceptance (space, electric wiring, water supply and drainage) are in place. X-ray blocks are designed under the Third Health Project and work on facilities is scheduled to be completed before installation of equipment, so there should be no problems.

Fig. 4-2 Typical Layout Plan of an RHC



4-2-10 Review of Equipment Content

(1) Review Summary

Requested equipment is composed of that for the 5 BHU departments and the 8 RHC departments as stated in section 2-4-2. Most of the equipment is for the replacement of existing items in the subject institutions which are either broken down or superannuated. Some of the equipment like X-ray apparatus needs to be newly procured, but other items can be said to be basic equipment needed for general use. Therefore it is fair to say that this equipment is appropriate to the current situation and treatment levels in the subject institutions. However, due to the fact that delivery tables and investigation equipment such as centrifuges and microscopes exist and are functioning sufficiently at some institutions, some adjustment of quantities is necessary.

Regarding the selection method for equipment, review of each requested item was done in consideration of the following criteria (a. to g.).

a. It must comply with the subject institution's functions,
b. It must not overlap with other equipment procurement projects,
c. Existing equipment must not be functioning sufficiently,
d. It must be equipment directly related to medical care,
e. It must be manageable under current maintenance capacity,
f. Expendable items must be easily obtainable locally, and
g. Equipment operators must be in place for the renewal of existing equipment.

(2) Results of Selection Review of Each Equipment Item

1) BHU Equipment

1. Minor surgery equipment

Replacement of superannuated minor surgery instrument sets, treatment sets and boiling sterilizers to be reviewed.

2. Outpatient examination equipment

Replacement or new procurement of superannuated or defective sphygmomanometers, obstetric diagnostic instrument sets and examination tables to be reviewed.

3. Maternal and child health care equipment

Replacement or new procurement of superannuated or defective weighing scales to be reviewed.

2) RHC Equipment

1. Furniture

Examination tables to be the subject for new procurement review.

2. Minor surgery equipment

Renewal of examination instruments, surgical forceps, operating tables, surgical lamps, boiling sterilizers and suction units to enable first-aid dispositions in the subject institutions to be reviewed. The following equipment is excluded as for minor surgery equipment. The reasons are described hereunder.

* Anaesthesia apparatus; that's because Laparotomies are not carried out as a function of RHC, such cases will be referred to higher level hospitals with an ambulance such a DHQ hospital and it is difficult to secure regular supply of such consumables as anaesthesia gas and oxygen for Anaesthesia apparatus.
* Diathermy set; that's because Laparotomies are not carried out as a function of RHC, such cases will be referred to higher level hospitals with an ambulance such a DHQ hospital and it is difficult to secure regular supply of such consumables as pincers for diathermy set.
* Instrument sterilizer; as H-17 is the same item as H-36, H-36 is kept as subject of investigation and H-17 is excluded.
* Sponge holding forceps; as H-14 is the same item as H-23, H-14 is kept as subject of investigation and H-23 is excluded.
* Bone saw; such operations are not conducted as a function of RHC and such a case will be referred with an ambulance.
* Suction unit; as H-20 is the same item as H-38, H-20 is kept as subject of investigation and H-38 is excluded.

* Proctoscope; a surgical diagnosis with it is not a function of RHC.

3. Obstetrics Department Equipment

As was stated earlier, almost all deliveries take place in homes and hardly at all inside BHUs and RHCs. However the Health Department intends to increase the number of deliveries in BHUs and RHCs via the educational activities of LHVs in the communities, and because the number of such deliveries is expected to rise in the future, procurement of delivery tables is necessary. For abnormal deliveries, trained women medical officers should be able to carry out forceps deliveries, and so the necessity of forceps is also seen as necessary. Normal deliveries will continue to be performed in homes for the time being, but in future will be performed in the LHV room of BHUs and RHCs by an LHV. It was accepted that forceps sets for use in normal deliveries are in place. Consequently, the study teams made delivery forceps and delivery tables subjects for review in the 37 RHCs which possess women medical officers with the object of coping with minor complicated deliveries.

4. Ward equipment

Beds and lockers were excluded because existing items are sufficiently functional and because they have little direct relationship with medical care. Urine bottles and spitting boxes which are necessary for patient care to be made subjects of review.

5. Laboratory equipment

Equipment used in laboratories is composed of basic items such as microscopes, ESR stands, binocular microscopes, hemoglobinometers, centrifuges and glass-wares. Moreover, as almost all such items are superannuated and hardly maintaining its levels of examination precision, its renewal is recognized. Consequently, the study teams made such equipment the subject of review for 74 RHCs. The following equipment is excluded. The reasons are described hereunder.

* Burette stand, pipette rack, beaker set, reagent glass bottle set, graduated cylinder set and funnels set; because investigations which need preparation of reagents are not carried out as function of RHC, there are no technicians who can prepare reagents and such an item as a microscope can complete most of investigations.
* Stopwatch; an ordinary watch is sufficient.
* Laboratory table; existing ones are sufficient enough.
* Urinometer; as an albminometer (k-06) has a function of determining specific gravity.
* Glucometer; it is difficult to secure supply of test paper as an consumable; to maintain; glucose examine is required to control regularly by a specialist doctor.

6. X-ray equipment

X-ray equipment is to be reviewed as the subject for 33 RHCs excluding those institutions don't overlap with other aid projects and already fitted, in districts which possess electrical wiring.

7. Dental equipment

Currently in operation at 68 RHCs. Installation in 14 more institutions scheduled to be renovated under the Third Health Project is planned. The Health Department has already ordered new items and has requested procurement for 25 sets to replace current superannuated items. However, the site studies found all of these to be still sufficiently useable and upon presentation of these results to the Pakistan side, it was explained that there is no need for renewal. Consequently all dental units were excluded as a subject of review.

8. Autopsy equipment

RHCs do not perform autopsies as one of their functions, so this has been removed as a subject of review.

9. Ambulances

Almost all RHCs do not possess ambulances. On average, RHCs convey 1 patient per day to referral hospitals. The Health Department has

procured 2 and non-governmental organizations (NGO) have procured 3 ambulances, so deducting these, the Health Department requested the procurement of ambulances for 69 RHCs and the study teams decided to make them the subject for review.

10. Other equipment

In consideration of the frequent power cuts in the subject area, rechargeable fluorescent lamps and generators for electrical medical equipment have been made the subject for review.

Stretchers for the transfer of patients within the subject institutions have also been made the subject for review.

Table 4-1 is a list of medical equipment review results and shows the results of content reviews for each item of equipment based upon consideration of the evaluation criteria (a. to g.) listed below.

The Xs in the evaluation criteria (a. to g.) columns in the table indicate that the criteria have not been met and that the applicable equipment will be deleted or reduced. Review results are indicated on the right of the table in the review results quantity column.

a. It must comply with the subject institution's functions,
b. It must not overlap with other equipment procurement projects,
c. Existing equipment must not be functioning sufficiently,
d. It must be equipment directly related to medical care,
e. It must be manageable under current maintenance capacity,
f. Expendable items must be easily obtainable locally, and
g. Equipment operators must be in place for the renewal of existing equipment.

Table 4- 1 List of Medical Equipment Review Results

Q'ty (A) : Q'ty of Request
Q'ty (B) : On further investigation Q'ty

(1) Equipment for BHUs

Item No.	Equipment Name	Q'ty (A)	Selection Criteria							Q'ty (B)
			a	b	c	d	e	f	g	
A-01	Instruments Set	4 x 663								248
A-02	Sphygmomanometer (mercurial) Diagnostic Set	2 x 663								206
A-03	Gynecological examining set	1 x 663								663
A-04	Treatment Set	1 x 663								663
A-05	Obstetric Delivery Table	1 x 663	×							0
A-06	Patient Bed	2 x 663			×					0
A-07	Examining Table	1 x 663								663
A-08	Stretcher	1 x 663			×					0
A-09	X-ray Film Illuminator	1 x 663	×		×					0
A-10	Oxygen Inhaler Set	2 x 663	×					×		0
A-11	Refrigerator	1 x 663			×					0
A-12	Weighing Scale for Adult and Infant	2 x 663								355
A-13	Sterilizer	1 x 663								271
A-14	Laboratory Equipment	1 x 663	×							0
A-15	Laboratory Table	1 x 663	×							0
A-16	Bicycle	1 x 663				×				0
A-17	Motor cycle	1 x 663				×				0
	Furniture for BHU same as RHC	1 x 663				×				0

(2) Equipment for RHCs

Item No.	Equipment Name	Q'ty (A)	Selection Criteria							Q'ty (B)
			a	b	c	d	e	f	g	
G-01	Revolving Chair	4 x 74				×				0
G-02	Office Chair	12 x 74				×				0
G-03	Office Table	12 x 74				×				0
G-05	Steel Almirah (locker)	6 x 74				×				0
G-06	Examining Couch	4 x 74								74
G-07	Benches with Arms and Back Rest	15 x 74				×				0
G-08	Revolving Chair	10 x 74				×				0
G-10	Folding Chair	20 x 74				×				0
G-11	Folding Screen (2 hold)	4 x 74				×				0
H-01	Instrument Tray with Cover (45cm)	4 x 74								296
H-02	Tray kindney shaped	4 x 74								296
H-04	Bowls (21cm)	4 x 74								296
H-05	Basin (36cm)	8 x 74								222
H-06	Jug (M)	8 x 74								222
H-07	Probe 188mm	6 x 74								296
H-08	Forceps Artery Mesquite str.	30 x 74								740
H-09	Scissors Dressing str.	6 x 74								444
H-10	Needle Holder Mayo-Hegar 200mm	6 x 74								444
H-11	Needle Suture, straight and curved	20 x 74								370
H-12	Cusco's Vaginal Speculum S/M/L	4 x 74								148
H-14	Sponge Holding Forceps 245mm	4 x 74								296
H-15	Vulselum Forcepls	2 x 74								148
H-16	Dilator Set Hegar	2 x 74								74
H-17	Instrument Sterilizer (36cm)	4 x 74	—	—	—	—	—	—	—	0
H-18	Saline Infusion Stand	5 x 74								222
H-19	Oxygen Therapy Unit	5 x 74	×					×		0
H-20	Portable Scution Unit	2 x 74								74

Item No.	Equipment Name	Q'ty (A)	Selection Criteria							Q'ty (B)
			a	b	c	d	e	f	g	
H-21	Pelvimeter	2 x 74	×							0
H-22	Cheatle Steriilzer Forceps	6 x 74								296
H-23	Sponge Folding Forceps	6 x 74	—	—	—	—	—	—	—	0
H-24	Delivery Set	1 x 74							×	37
H-25	Airway	4 x 74								74
H-26	Check Retractor Oringer and Mouth Gouge	2 x 74								74
H-28	Swab Holding Krause	5 x 74								296
H-29	Tongue Holding Krause	2 x 74								74
H-30	Pean Forceps 18mm	12 x 74								740
H-31	Volkmanne spoon (double ended)	3 x 74								148
H-32	Bone Saw	1 x 74	×							0
H-33	Operation Theatre Table	1 x 74								74
H-34	Operation Theatre Ceiling Lamp	1 x 74								74
H-35	Auto clave (w/boiler) Medium	2 x 74								74
H-36	Electric Sterilizer (45cm)	1 x 74								47
H-37	Anaesthesia Appartus	1 x 74	×				×	×		0
H-38	Sucker machine	1 x 74	—	—	—	—	—	—	—	0
H-39	Diathermy Set	1 x 74	×				×	×		0
H-40	Dressing Drums	12 x 74								222
H-41	Instrument Tray	12 x 74								296
H-42	Procto Scope	2 x 74	×							0
H-43	Rubber Catheter (neraton) each size	4 x 74								148
H-44	Metal Catheter Set	2 x 74								74
H-46	Dissection Forceps 130mm	10 x 74								370
H-47	Dressing Trolley	4 x 74								148
H-48	Delivery Table	1 x 74								37
H-50	Delivery Forceps Keiland	2 x 74								37
H-52	Towel Clips	20 x 74								370

Item No.	Equipment Name	Q'ty (A)	Selection Criteria							Q'ty (B)
			a	b	c	d	e	f	g	
H-53	Surgical Blade 10 sizes	12 x 74								888
H-54	Diagnostic Set	2 x 74								148
H-55	B.P. Apparatus Desk	4 x 74								148
H-56	Percussion Hammer	2 x 74								148
H-57	Stethoscope	6 x 74								296
H-58	Lumber Puncture Needle	2 x 74								148
I-01	Temperature chart Holder	20 x 74								740
I-02	Hospital Bed	30 x 74			×					0
I-03	Bedside Locker	30 x 74				×				0
I-04	Sputum Cups with Cover	10 x 74								740
I-05	Bedpan with Handle	4 x 74								148
I-06	Urinal Male	4 x 74								148
I-07	Urinal Female	4 x 74								148
K-01	Electric Centrifuge	1 x 74								54
K-02	Burette Stand	1 x 74	×							0
K-03	Pipette Rack	1 x 74	×							0
K-04	Urinometer Set	2 x 74	—	—	—	—	—	—	—	0
K-05	Wire Gaure, 210x210mm	2 x 74	×							0
K-06	Albuminometer	1 x 74								74
K-07	Beaker Set	3 x 74	×							0
K-09	Reagent Glass Bottle Set	1 x 74	×							0
K-11	Graduated Cylinder Set	1 x 74	×							0
K-12	Funnels Set	1 x 74	×							0
K-13	Slides Microscopic	100 x 74								74
K-14	Centrifuge Tube, 15ml	30 x 74								74
K-15	Urino Cup	20 x 74								2220
K-16	Ghamber Neubaur (Hemacytometer)	1 x 74								1480
K-18	E.S.R.Stand with Tube	1 x 74								74

Item No.	Equipment Name	Q'ty (A)	Selection Criteria							Q'ty (B)
			a	b	c	d	e	f	g	
K-20	Hemoglobinometer Shili's with 10 Pipettes	1 x 74								74
K-23	Microscope Binocular	1 x 74								38
K-25	Stop Watch	2 x 74			×					0
K-26	Table Laboratory	1 x 74			×					0
K-27	Sprit Lamp	2 x 74								74
K-28	Test Tube and Holder Set	1 x 74								74
K-30	Glucometer	1 x 74	×					×	×	0
L-01	X-ray Plant 100mA	1 x 74								33
L-02	Development System	1 x 74								33
L-03	Film Illuminator (1 film)	6 x 74								33
M-01	Dental Unit	1 x 74		×	×					0
M-02	Dental Instrument Set	1 x 74		×	×					0
M-03	Dental Cabinet	1 x 74		×	×					0
M-04	Oral Instrument Set	1 x 74		×	×					0
M-05	Laryngoscope	2 x 74								74
N-02	Typewriter	3 x 74				×				0
N-03	Refrigerator (9 cft)	1 x 74			×					0
N-04	Air Conditioner	1 x 74				×				0
N-05	Re-chargeable Fluorescent Lamp	4 x 74								148
N-06	Stove Primus	2 x 74				×				0
N-07	Stretcher	2 x 74								74
N-08	Bicycle	1 x 74				×				0
N-09	Generator Portable	1 x 74								74
N-10	Weighing Scale (adult/child)	1 x 74			×					0
N-11	Vehicle	1 x 74				×				0
N-12	Ambulance	1 x 74								69
O-01	Postmortem Instrument Set	1 x 74	×							0
O-02	Ordinary Weighing Machine	1 x 74	×							0

4-2-11 Review of Need for Technical Cooperation

The equipment requested by the Health Department under this project is composed of many basic items, and all of it is used generally in health care institutions. As a result, the current health workers are well skilled in its operation.

When one considers the current state of equipment management, as the procurement of necessary consumables and replacement parts is not going smoothly, improvements on the management side including maintenance are needed. It is thought that this situation can be handled by proposing an improvement plan for the maintenance setup including control forms sent to the Health Department together with the equipment.

Forceps deliveries in RHCs are performed by women medical officers (general practitioners), but it is necessary for them to receive training for a period of 6 months to one year since they are not specialists in this. It is possible to receive training at the Lady Reading Hospital in Peshawar or at the DHQ hospitals in each district.

In view of all this, it is thought that there is no need for any special technical cooperation.

4-2-12 Basic Policy of Aid Execution

Japanese cooperation is limited to grant aid for the procurement of medical equipment and does not include such technical cooperation as the dispatch of specialists in tandem with that. This procurement of equipment is to be executed only once within 1 fiscal year. As a result, due to the characteristic of Japanese cooperation of completion within 1 fiscal year, it has the advantage of enabling the necessary conditions to be executed in the short period of just one year after the exchange of notes (E/N) has taken place.

The subject of this project are the primary health care institutions of BHUs and RHCs which are the institutions most frequently used by the local residents. Consequently, it is easy to understand that from the point of view of improving the quality of daily life for the local residents, the beneficial effects are enormous.

However because much of this project overlaps with that of other aid agencies, it is necessary to carry out fine adjustments in order to achieve a more effective and efficient form of cooperation.

The basic policies of Japan regarding this project are as follows.

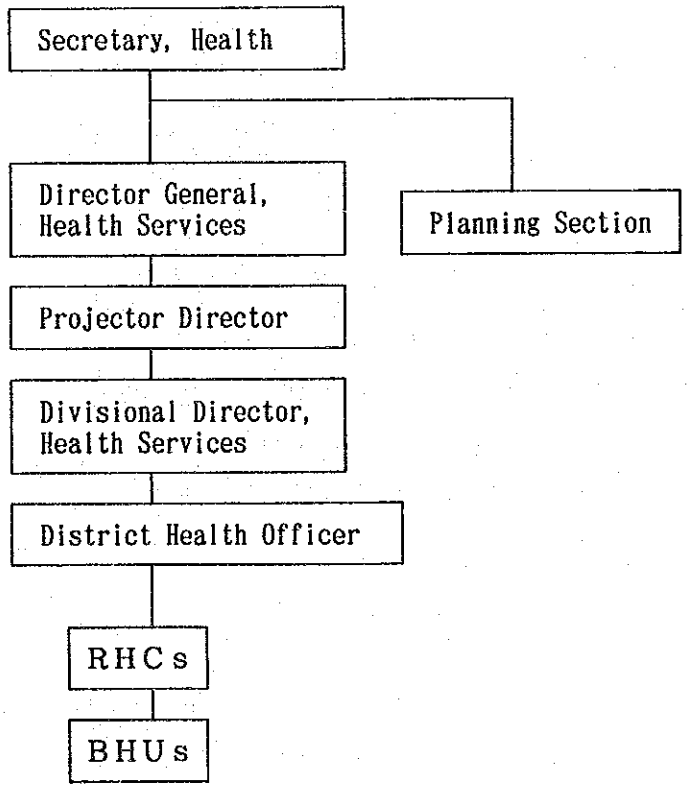
1. To procure items which are recognized as not being overlapping, in institutions where functions are insufficient and for which replacement is necessary,
2. Regarding areas which overlap with other aid agencies, if they are seen as urgent and the Pakistan side requires their immediate execution, such execution by Japan is to be reviewed on the condition that the consent of the aid agency concerned is obtained, and
3. To procure items locally is to be reviewed on the condition that the items are manufactured locally, their quality is good enough and it functions sufficiently.

4-3 Outline of the Project

4-3-1 Executing Agency and Management Set-up

The executing agency for this project is the Health Department, NWFP. The BHUs and RHCs which are the subject of the project are the smallest units of the Health Departments organization. Figure 4-3 shows the management setup for the Health Department.

Fig. 4-3 Management Set Up for the Health Department



4-3-2 Summary of Equipment

The subject of execution of this project are the 74 RHCs and 663 BHUs under the jurisdiction of the NWFP Health Department and the main items of projected equipment are composed of equipment for minor surgery, clinical investigation, X-ray, obstetrics and also vehicles. Main equipment for each department is as follows.

1. Minor Surgery Department

Autoclave : for sterilization of mainly forceps.

2. Laboratory

Microscopes : for screening of infections such as malaria and tuberculosis.

3. X-ray Department

X-ray plant : for simple photography of chest, head and limb areas.

4. Obstetrics Department

Delivery tables : for deliveries.

5. Vehicles

Ambulances : for transportation of patients to higher level medical care institutions such as DHQ hospitals.

4-3-3 Maintenance Plan

The maintenance of medical equipment in hospitals under the jurisdiction of the NWFP Health Department is the responsibility of the District Health Officer in each district. This is the case for equipment rectified under this project, however the problem areas of the current maintenance setup are to be improved and the following effective and efficient maintenance systems should be constructed.

(1) Replacement Parts Supply System

Instead of the district health officer's in each district, workshops are to purchase replacement parts being necessary for equipment maintenance, and equipment suppliers are to provide the onerous supply of items for a period of at least 8 years after the expiration of the initial warrantee period. Estimates concerning the prices of items requiring frequent replacement are to be sent to the Health Department in advance. Workshops shall make an annual trial calculation for replacement part costs and the Health Department shall devise budget measures accordingly.

(2) Expendable Items Supply System

As is the case with replacement parts, expendable items are requested to the Health Department by the health officer in each district and based upon that, the Health Department's medical depot purchases the items from agents and these are supplied to each hospital. A period of at least 8 years of onerous supply after the expiration of the initial warrantee period is to be secured for expendable items too. The supplier is to present estimates for necessary expendable items to the Health Department in advance. Each district health officer's shall make an annual trial calculation for expendable item costs and devise budget measures accordingly.

(3) Fostering of Maintenance Staff

At the time of equipment installation, the equipment supplier shall dispatch an engineer to teach equipment operating responsibilities the correct methods of operation and the way of performing daily checks etc. At the same time, training for the engineers in each workshop on methods of maintenance inspections for equipment such as X-ray plants, sterilizers and ambulances shall be carried out. When carrying out such training, English versions of operation and maintenance manuals (electric circuit diagrams, parts lists and maintenance & inspection methods etc) being necessary for operation and maintenance work are to be supplied.

(4) Devising of Maintenance Plan

The Health Department shall organize a maintenance committee and provide guidance to each district health officer regarding the execution of daily equipment checks. Moreover, in order to keep track of the state of operation of the equipment, the medical officer of each health care institution shall keep records and present regular reports to the district health officer who has jurisdiction over the district concerned. Moreover, copies of these reports are to be presented to the maintenance committee which shall compile annual equipment management plans based upon the received information.

(5) Technical Support Setup

In order to enable technical advice to be given on normal repair and operation for comparatively high level items of equipment such as X-ray plant, procurement shall be carried out with priority given to those models of which agents possess a permanently stationed specialist engineer.

4-3-4 Management Budget

(1) Budgetary Measures for Project Execution

Excluding X-ray plants and ambulances, most of the equipment procured under this project is for the renewal of existing superannuated equipment. Therefore, there is no need to make big increases in personnel and the forecast rise in salaries is being appropriated from the provincial government by the Health Department in the 1994 budget.

Regarding maintenance costs, the Health Department has put aside 38.76 million rupees (about 135.66 million Japanese Yen) and maintenance costs for project equipment will be allocated from this.

Moreover, because almost all the equipment is procured for renewal purposes, it is fair to think that its effect on the management budget is small.

(2) Trial Calculation of Maintenance Costs

1) Costs involved in procurement of expendable items

Most of the equipment procured under this project is for the renewal of existing equipment. Therefore the procurement costs of expendable items which require new budgetary measures under this project can be obtained by making a trial calculation of the expendable costs of newly procured items of equipment. Those items of newly procured equipment which require expendable items, and those annual purchase costs are as follows.

Expendable items here mean such things as record paper for monitors, X-ray film and lubricating oil, and a trial calculation was made based

upon local purchase prices and the amount that would be consumed in one year assuming that 8 hours of operation were performed daily.

Table 4-2 Annual Consumables Cost for the Equipment to be Procured Newly

Name of Equipment	Q'ty	Consumables Cost (Rs./year)
X-ray equipment	33	Rs. 78,000 × 33
Ambulance	69	Rs. 4,795 × 69
Total (A)		Rs. 2,904,855

2) Costs involved in periodic inspections and repair service

A small degree of the the equipment requested under this project requires periodic inspections by an engineer as well as daily checks, however none of the equipment is of difficult technical levels. Consequently, the periodic inspections of this equipment shall as a rule be carried out by the Health Department workshops. Items in need of periodic inspections are X-ray plants and ambulances. Parts replacement will be sometimes necessary in the periodic inspection and repair service. Replacement parts costs shall be obtained by adding up the costs of local purchase of those replacement parts forecast as necessary each year by the manufacturers concerned with the above items. Table 4-3 shows the equipment item separate replacement parts costs.

Table 4-3 Annual Cost for Spare Parts on the Equipment to bo Procured Newly

Name of Equipment	Q'ty	Parts cost (Rs/year)
X-ray equipment	33	Rs. 54,600 × 33
Ambulance	69	Rs. 11,140 × 69
Total (B)		Rs. 2,570,460

Consequently, the rough estimate of increased annual maintenance costs under this project is as follows.

Increased maintenance costs =

annual expendable costs (A) + annual replacement parts costs (B)

= Rs. 5,475,315

CHAPTER 5 BASIC DESIGN

CHAPTER 5 BASIC DESIGN

5-1 Basic Design Policy

Regarding the basic design of equipment, the study team carries out equipment selection on consideration of the functions and current conditions of subject institutions clarified through discussions with the NWFP Health Department by site study results.

(1) It must comply with the subject institution's functions,

(2) It must not overlap with other equipment procurement projects,

(3) Existing equipment must not be functioning effectively,

(4) It must be equipment directly related to medical care,

(5) It must be manageable under current maintenance capacity,

(6) Expendable items must be easily obtainable locally, and

(7) Equipment operators must be in place for the renewal of existing equipment.

5-1-1 Policy Concerning Natural Conditions

The subject area has long summers and the climate is hot and dry. Fine sand and dust tends to infiltrate buildings during the dry season, therefore equipment possessing high dust resistance and resistance to temperatures of 40°C is desired.

5-1-2 Policy Concerning Social Conditions

The subject area is conservative and women medical officers perform treatment activities in obstetrics and gynecology departments.

5-1-3 Policy Concerning Institution Conditions

Rated voltage and current in the subject area are 230V and 50HZ respectively, but voltage fluctuations are large and values are always 10-20% higher than rated values. As well as this, momentary power cuts occur 3 to 5 times a month, so in order to avoid the bad effects of voltage fluctuations to an X-ray plant, an automatic voltage regulator is to be installed as its specifications.

Subject institutions do not possess treatment facilities for laboratory waste liquids which are consequently drained away as they are. Therefore in order to ensure that the subject institutions do not become a source of secondary infections, autoclaves of the steam variety shall be considered as bacterial liquid treatment equipment.

5-1-4 Policy Concerning Utilization of Local Manufacturers and Local Materials and Equipment.

As the cooperation of local agents is indispensable for equipment maintenance, it is necessary that equipment agents for relatively high level items such as an X-ray plant and vehicles exist within NWFP, and it is also necessary to provide for a supply system of expendable items and replacement parts and also for the ability of engineers.

5-1-5 Policy Concerning Maintenance Capacity of Executing Agencies

At delivery times, information necessary for maintenance such as technical materials including electric circuit diagrams, and routes for obtaining replacement parts is to be provided to workshop technicians according to their technical abilities.

5-1-6 Policy Concerning Limits and Level of Equipment

The limits and level of equipment are to be set based upon the functions and activity contents of the institutions concerned and also the technical levels of the medical staff members. Moreover, the following points are to be taken into consideration.

(1) The components, specifications and level of the equipment shall be in accordance with the specifications of equipment in widespread use in the institutions.

(2) In executing this project, aid shall be given to the execution responsibility (Project Director) as the focus for building a maintenance setup.
In concrete terms, equipment operation manuals and service manuals shall be procured as part of the equipment package. Furthermore, in order to secure