

MINISTRY OF HEALTH  
THE ISLAMIC REPUBLIC OF PAKISTAN

No. 1

**BASIC DESIGN STUDY REPORT**

**ON**

**THE PROJECT FOR IMPROVEMENT OF BASIC HEALTH CARE BY  
SUPPLYING ESSENTIAL EQUIPMENT/INSTRUMENTS  
TO BHUs AND RHCs IN BALOCHISTAN PROVINCE**

**IN**

**THE ISLAMIC REPUBLIC OF PAKISTAN**

**MARCH 1998**

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**JAPAN INTERNATIONAL COOPERATION AGENCY  
DAIICHI HEALTH CARE FACILITY CONSULTANTS INC.**

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1148292 [4]

## Preface

In response to a request from the Government of Islamic Republic of Pakistan the Government of Japan decided to conduct a basic design study on the Project for Improvement of Basic Health Care by Supplying Essential Equipment/Instruments to BHUs and RHCs in Balochistan Province in the Islamic Republic of Pakistan and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Islamic Republic of Pakistan a study team from October 21 to November 19, 1997.

The team held discussions with the officials concerned of the Government of Pakistan, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Pakistan in order to discuss a draft basic design, and as a result, the present report was finalized.

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

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

March, 1998



Kimio Fujita  
President  
Japan International Cooperation Agency

March, 1998

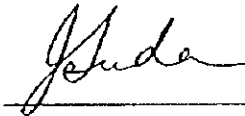
### Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Basic Health Care by Supplying Essential Equipment/Instruments to BHUs and RHCs in Balochistan Province.

This study was conducted by Daiichi Health Care Facility Consultants Inc. , under a contract to JICA, during the period from October 9, 1997 to March 31, 1998. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Pakistan and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



---

Junko Tsuda  
Project Manager,  
Basic Design Study Team on the Project for  
Improvement of Basic Health Care  
by Supplying Essential Equipment/Instruments to  
BHUs and RHCs in Balochistan Province



# PAKISTAN AND SURROUNDING COUNTRIES



BALUCHISTAN PROVINCE



## Abbreviations

ADB	Asian Development Bank
BHU	Basic Health Unit
CD	Civil Dispensary
E/N	Exchange of Notes
EMW	Electro-medical Workshop
DFID	Department for International Development
DHO	District Health Office
GNP	Gross National Product
IDA	International Development Association
KFW	Kreditanstalt für Wiederaufbau
LHV	Lady Health Visitor
LHW	Lady Health Worker
MCHC	Maternal and Child Health Center
MSD	Medical Store Depo
PHC	Primary Health Care
PHDP	Pakistan Health Care Development Project
RHC	Rural Health Centre
TBA	Traditional Birth Attendants
SAP	Social Action Programme
UNDP	United Nations Development Programme
WB	World Bank
WHO	World Health Organization



## SUMMARY

The Islamic Republic of Pakistan has attained its independence in 1947 from British colonial regime, which had occupied Indo-Pakistan continent since 1876, with two separate territories towards the east (former East Pakistan) and the west (former West Pakistan) from India (In 1971, East Pakistan became independent and separate due to political and economic differences between the two Pakistans).

Pakistan economy, after the Fifth Five Year Plan (1978/79 – 1982/83) has been launched under the free economy policy, is going on the stable way in spite of the political and social uncertainty after 1989. The major export products including cotton products which occupy 60% of the export merchandise of the country depend on the international market including weather conditions, however, average GDP is 5.1% under the guidance by the World Bank and IMF after 1988. Pakistan, despite its high economic growth rate, has been suffering from low literacy rate (35% in 1990) and high population growth rate (average of the past 5 years is 3.1%), which would be obstacles of future development, and GNP per capita is US\$416 (1992) and also in spite of steady improvements in health sector over the years the position is not yet satisfactory.

The area of Balochistan province occupies about 43% of the whole area of Pakistan (approx. 350,000Km<sup>2</sup>) with sparse population counting only 5.6% of the total population of Pakistan (approx. 7.4 mill in 1995). The province which composes Pakistan with other three provinces, has longitude from 61° to 70° east, and latitude from 25° to 32° north surrounded with the southern border facing Afghanistan and North West Frontier Province and the eastern border facing Punjab and Shind Provinces. Balochistan province is divided into 6 divisions, 26 districts, 58 tehsils and 55 union councils etc. Capital city of the province is Quetta, the administrative center of Balochistan, which has about 500,000 of population. Except dwellers in urban areas, most of people have nomadic life style. Majority belongs to Iranian-Balochi tribe speaking Balochi, whose original ancestors were Kurdish living in the southern Iran near Syria.

In Pakistan, provincial development plan of health care should follow national development policy designated by the central government, except province-owned projects, which are under direct control of provincial government, and subsidiary budget is allocated accordingly. The provincial government of Balochistan has been implementing the improvement of basic health care services and training of medical manpower under Five Year National Development Plan and Social Action Programme-II or SAP-II.

The Health Referral System of Pakistan is three tier as teaching and special hospital for the tertial level, Divisional Headquarter Hospital, District Headquarter Hospital, Tehsil Hospital and Civil Hospital for the secondary level, and Rural Health Center, Basic Health Unit, Maternal and Child Health Center, Civil Dispensary and Sub Health Center for the primary level. This referral system is not always functioning because of the access conditions and the unsatisfactory of the health manpower allocation of the institutions in the remote area. Such is the conditions of the facilities concerned, patients who could not attended in the primary level institutions go to the district hospitals or the teaching hospitals out of the province which are located in the good accessibility.

Most of RHCs and BHUs in the province are located in remote areas so that they face various problems such as lack of medical manpower, basic medical equipment, medicines, and fundamental infrastructure (electricity and water supply, communication facilities etc), and furthermore insufficient budget allocation from the provincial government exacerbates the situation as essential health care services are not properly provided. Considering these circumstances, the Government of Pakistan has decided to improve and strengthen primary health care services of Balochistan province as a part of primary health care development plan in accordance with the 8<sup>th</sup> Five Year National Development Plan, and made a request to the Government of Japan for her grant aid assistance for the provision of essential medical instruments / equipment for RHCs and BHUs, which is core medical institution of primary health care services at village level and suffering from the shortage of necessary medical equipment, communication equipment at union level, and information system at district level and supervisory vehicles for District Health Offices.

In response to this request, the Government of Japan dispatched preliminary study mission to Pakistan in June, 1997. The mission made the studies on the background and effect of the feasibility of the project in consideration of the relevant programmes of the country. Upon results made by the mission the Government of Japan decided to conduct a basic design study on the project for the period of October 21 to November 19, 1997. After the analysis made in Japan the draft basic design study on the project was sent to Pakistan to discuss the draft basic design report prepared by the mission for the period of January 30 to February 8, 1998. The study mission visited some BHUs and RHCs and other related institutions to study the preset conditions and to collect data.

The objectives of the Project are to improve the diagnostic and curative level of the health services for the population of the union councils by supplying essential equipment /instruments to the primary health service institutions. The target institutions are BHUs, RHCs (431 BHUs and 47 RHCs as of April, 1997) and DHOs which directly control and supervise those institutions.

Most of RHCs and BHUs in the province are located in remote areas so that they face various problems such as lack of medical manpower, basic medical equipment, medicines, and necessary facilities (electricity, water, communication), and furthermore insufficient budget allocation from the provincial government exacerbates the situation as essential health care services are not properly provided. Particularly, regarding medical manpower, it is a problem of urban-rural-gap that there are not many medical institutions where female doctors work, and in such institutions Lady Health Visitors (LHVs) or Lady Health Workers (LHWs) cover the shortage to some extent. They are visiting the homes regularly to consult for the general health check of the house wives and the babaies who are restricted to go out for this purpose due to the religious and social customs. Such outreach services include the Expanded Programme for Immunization under the Prime Minister Programme of the country/

The equipment under the project is for the provision of the essential instruments / equipment to be utilized for the services of 463 BHUs and 68 RHCs (number is as of November, 1997 and includes the upgraded institutions) and the services of the District Health Offices. The equipment planning for the project is summarized as follows in consideration of the results of the study with the officers concerned of Balochistan.

- 1) BHUs and RHCs should be equipped with the basic and essential equipment/instruments as the common kits by which necessary services would be provided.
- 2) The additional equipment should be selected according to the necessity and relevancy.
- 3) Allocation of the medical manpower and the yearly number of the curative patients as well as the catchment population should be taken into account for the selection of the project institutions.

According to the above criteria, 454 BHUs and 60 RHCs will be equipped with the instruments / equipment under the project. and the equipment /instruments list with its components are summarized as follows:

### Equipment / Instruments List

Name of Kit	Contents of Equipment	Total Q'ty	Site
<b>BHU/ RHC</b>			
Essential Diagnostic Kit	(1) Diagnostic Kit (2) BP Apparatus Fixed on Wall (3) Sphygmomanometer	514	BHU RHC
First Aid Kit	(1) First Aid Set	514	BHU RHC
MCHC Kit	(1) D&C Set, TBAs Kit (2) Birth Calendar (3) Treatment Set	498	BHU RHC
Delivery Kit	(1) Delivery Set	498	BHU RHC
Basic Laboratory Equipment Kit	(1) Laboratory Set	253	BHU RHC
Multi Purpose Microscope	(1) Multi Purpose Microscope	253	BHU RHC
Basic Operation Kit	(1) Basic Operation Set (2) Sterilizer	253	BHU RHC
E.N.T. Kit	(1) E.N.T. Ophthalmo Set	253	BHU RHC
Dental Instruments Kit	(1) Dental Instruments Set	253	BHU RHC
Others for BHU	(1) X-Ray Plant (300mA) (2) Generator (25-33KVA) (3) Water Filtration Tank (0.5 t)	2	BHU
<b>RHC</b>			
Generator (25-33KVA)		22	RHC
Spectrophotometer		30	RHC
Autoclave		35	RHC
Electric Centrifuge		30	RHC
Refrigerator		41	RHC
Operation Set	(1) Mobile Operation Lamp w/ B (2) Operation Theater Table (3) OT Instruments	33	RHC
Ambulance	(1) Box type (2) Pick up type	30	RHC DHO
Water Filtration Tank (0.5 t)		7	RHC
X-Ray Plant (300mA)	(1) X-Ray (300mA) (2) Developing System(Manual) (3) Film Illuminator (1 Film)	10	RHC
I/V Stand		45	RHC
Delivery Table		3	RHC
Basic Laboratory Equipment	(1) Incubator (2) Water Bath	9	RHC
Workshop Maintenance Tool	(1) Oscilloscope	5	EMW



External assistance agencies who have activities in the health sector of Balochistan are WB, ADB, KFW, DFID, UNICEF and WHO, among which DFID, WB and KFW are providing health manpower such as doctors, paramedical staff, ADB are supporting for the improvement of health institutions (39 RHCs and 4RHCs). Facilities for the maintenance of the medical equipment is managed by Electro-medical Workshop (EMW), which is under control of Provincial Health Department. EMW was established under the Third Health Project with aid assistance from ADB and DFID. Damaged equipment of public hospitals (including RHCs) is repaired by the EMW under the supervision of Balochistan Provincial Health Department and Director General Health Services. The headquarter workshop situated inside of Sandeman Provincial Hospital in Quetta, having maintenance instruments and full-time engineers provides actual repair works and conducts 6-month training courses for engineers for 4 branches of the workshop which are located in Sibi, Khuzdal, Kech and Loralai districts. Out of 2 branch workshops are not fully functioning. In case that equipment of RHCs and BHUs is out of order, and a nearby workshop branch is not functioning properly, engineers must be sent from other branches or the headquarter, resulting in long waiting time for repair. It is not always assured that sufficient spare parts are available at the workshop. Therefore, only equipment that does not need special maintenance should be selected to be procured as project equipment. As for X-ray plants, engineers appointed by the manufacturers through the Supplier will be sent to provide technical training at the time of the handing-over after installation to the local engineers working at the maintenance workshops on maintenance techniques and management. As for generators, only technical training at the time of the handing-over is to be given, while the installation is to be undertaken by Health Department of the Balochistan Government.

Most equipment to be supplied in this project are replacement of the deteriorated ones so that they do not need any additional maintenance costs and additional medical manpower for operation. Thus, consequently, no additional operating costs are required. However, it is recommendable that in order to secure constant operation of the equipment, the head of each District Health Office should be well informed about necessary items and amount of spare parts and consumables, and make a budget plan in cooperation with the Provincial Health Department. In addition, there are no particular financial concerns if it is expected that there would be an increase of incomes from users fees of laboratory examination, and governmental subsidies resulting from improved medical services with new equipment in the project institutions.

The cost to be born by the Pakistani side is roughly 1.894 million rupees (Banking commission for issuance of the Authorization to Pay; Transportation fee of the instruments / equipment from DHO to each project institutions; Training fee for the maintenance engineers) for Pakistani portion. The schedule to implement the project would require 12 months for

the detailed designing and the procurement, delivery and installation of the equipment.

The following effect will be brought through the project implementation.

- 1) Primary health care services will be upgraded in quantity and quality by procurement of the essential kits which will be utilized for the services of BHUs.
- 2) Additional equipment for RHCs will contribute to the upgradation of the diagnostic and curative level of services. In addition to this, work load of the divisional headquarter hospitals will become less if RHCs screening function is improved.
- 3) The procurement of ambulances will upgrade the emergency service activities in the district level as well as improve the relationship between the patients and institutions.
- 4) The health sector of Balochistan will be improved and the referral system of the district will be well organized.

Measures as shown below should be taken into account for the effective and continuous utilization of the project equipment

- 1) Monitoring on the Ambulances, X-ray Plants and Generators should be made by keeping the records of their utilization, breakdown time and running cost through which effective maintenance would be secured.
- 2) The replacement of the equipment should be planned after durability.
- 3) The spare parts and consumable should be registered on the Inventory Book to keep them in order.

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## **Chapter 1 Background of the Project**

## **Chapter 1 Background of the Project**

### **1-1 Background of the Project**

The Islamic Republic of Pakistan has attained its independence in 1947 from British colonial regime, which had occupied Indo-Pakistan continent since 1876, with two separate territories towards the east (former East Pakistan) and the west (former West Pakistan) from India (In 1971, East Pakistan became independent and separate due to political and economic differences between the two Pakistans).

Pakistan economy, after the Fifth Five Year Plan (1978/79 – 1982/83) has been launched under the free economy policy, is going on the stable way in spite of the political and social uncertainty after 1989. The major export products including cotton products which occupy 60% of the export merchandise of the country depend on the international market including weather conditions, however, average GDP is 5.1% under the guidance by the World Bank and IMF after 1988. Pakistan, despite its high economic growth rate, has been suffering from low literacy rate (35% in 1990) and high population growth rate (average of the past 5 years is 3.1%), which would be obstacles of future development, and GNP per capita is US\$416 (1992) and also in spite of steady improvements in health sector over the years the position is not yet satisfactory.

The area of Balochistan province occupies about 43% of the whole area of Pakistan( approx. 350,000Km<sup>2</sup>) with sparse population counting only 5.6% of the total population of Pakistan( approx. 7.4 mill 1995). The province which composes Pakistan with other three provinces, has longitude from 61° to 70° east, and latitude from 25° to 32° north surrounded with the southern border facing Afghanistan and North West Frontier Province and the eastern border facing Punjab and Shind Provinces. Balochistan province is divided into 6 divisions, 26 districts, 58 tehsils and 55 unions etc. Capital city of the province is Quetta, the administrative center of Balochistan, which has about 500,000 of population. Except dwellers in urban areas, most of the people have nomadic life style. Majority belongs to Iranian-Balochi tribe speaking Balochi, whose original ancestors were Kurdish living in the southern Iran near Syria. Most of Pakistan belongs to mountain areas of Slaimans and Keltarls leading to the border between Iran and Afghanistan, where the elevation is over 1000m and the land is covered with sand. The coastal areas along the southern border, belonging to sub-tropical dry zone, are also covered with sand.

Climate is hot and dry with little rainfall. There are four seasons consisting of summer from April to September, autumn in October, winter from November to February, and spring in March.

The paved roads are not common in the south-west coastal areas which are covered with sand and the mountain area. Traffic facilities are almost underdeveloped. Transportation measures such as air plane route to and from Karachi are mostly developed. Mountain areas in the North-east are also covered by sand, where people live with stock raising. Social infrastructure such as water supply and electric supply has the gaps between the areas. Mastung, Ziarat, Pishin near Quetta and Lasbella near Karachi are rather developed.

In Pakistan, provincial development plan of health care should follow national development policy designated by the central government, except province-owned projects, which are under direct control of provincial government, and subsidiary budget is allocated accordingly. The provincial Health Department under the Health Secretary manages the tertial level hospitals such as teaching hospital and specialized hospitals, while the Director General Health Services controls 6 divisional health offices and its 26 district health offices and district headquarter hospitals.

The Health Referral System of Pakistan is three tier as educational and special hospital for the tertial level, Divisional Headquarter Hospital, District Headquarter Hospital, Tehsil Hospital and Civil Hospital for the secondary level, and Rural Health Center, Basic Health Unit, Maternal and Child Health Center, Civil Dispensary and Sub Health Center for the primary level. This referral system is not always functioning because of the access conditions and the unsatisfactory of the health manpower allocation of the institutions. Such is the conditions of the facilities concerned, patients who could not attended in the primary level institutions go to the district hospitals or the teaching hospitals out of the province which are located in the good accessibility. The accessibility to the health institutions in the rural area are shown as Table 1-under. Most of RHCs and BHUs in the province are located in remote areas so that they face various problems such as lack of medical manpower, basic medical equipment, medicines, and fundamental infrastructure( electricity, water, communication etc), and furthermore insufficient budget allocation from the provincial government exacerbates the situation as essential health care services are not properly provided. As for the female medical officers and technicians are very small in number in addition to the medical personnel allocation gap between the urban and rual areas, where LHV and LHW are providing supplementary services. These situations are explained as the religious and cultural reasons by which ladies are not so freely admitted to go out. The utilization ratio of RHC, BHU, MCHC in Balochistan is 28%, 63.3% and 60% respectively according to the Utilization of Rural Basic Health Services in Pakistan.

Table 1-1 below shows the access to health facilities in rural areas and it is easily understood that many rural inhabitants who have no private vehicles are in the difficulty to receive primary health services.

Table 1-1 Access to health facilities in rural area

(unit : %)

Public Health Institutions		Within 5 Km	Within 5-10km	More than 10km
Hospital	Balochistan	6	22	72
	Whole Pakistan	15	27	58
RHC	Balochistan	17	11	72
	Whole Pakistan	33	21	45
BHU	Balochistan	36	20	44
	Whole Pakistan	39	38	23
CD	Balochistan	35	17	48
	Whole Pakistan	34	37	29

Source: Pakistan Integrated Household Survey (1995-1996)

Considering these circumstances, the Government of Pakistan has decided to improve and strengthen primary health care services of Balochistan province as a part of regional health care development plan in accordance with the 8<sup>th</sup> Five Year National Development Plan, and made a request to the Government of Japan for her grant aid assistance for the provision of essential medical equipment for RHCs and BHUs, which is core medical institutions of primary health care services at village level and suffering from the shortage of necessary medical equipment, communication equipment at local level, and information system at district level and supervisory vehicles for District Health Offices.

The objectives of the Project are to improve the diagnostic and curative level of the health services for the population of the union councils by supplying essential equipment /instruments to the primary health service providers. The target institutions are BHUs, RHCs (431 BHUs and 47 RHCs as of April, 1997) and DHOs which directly control and supervise those institutions.

## 1-2 Outline of the Project

Project institutions are the union level health institutions, 431BHUs and 47 RHCs (as of April 1997) and District Head Offices who supervise these institutions in the district level.

The equipment / instruments requested under the project is essential ones necessary for the provision of the primary level health service for the union people. The number of these institutions were 463 BHUs and 68 RHCs (as of November 1997) inclusive of the upgraded institutions under the health policy of the province. The following Table attached show the results on the equipment list included in PC-1 with the justification for judgement of the Equipment / Instruments by items-wise. Numbers 1 to 4 in the column Criteria to include and ones 5 to 8 in the column Criteria to exclude are put in accordance with the criteria referred in 2-2 Basic Concept of the Project hereof.













PO-1	Coord No.	Equipment List	Required Qty	Criteria to include								Criteria to exclude								Final	Remarks
				1	2	3	4	1	2	3	4	5	6	7	8	Planned Qty	Results				
		EQUIPMENT LIST																			
H-26		TONGUE HOLDING FORCEPS																x	Already in possession		
H-27		PEAN FORCEPS 188 mm																1			
H-28		VOLKMANNS SPOON ( DOUBLE ENDEDD.)	3																x	Already in possession	
H-29		BONE SAW	1																x	No frequent use	
H-30		OPERATION THEATRE TABLE	1																1	Stand type	
H-31		OPERATION THEATRE CEILING LAMP	1																1	Mobile type	
H-32		AUTOCCLAVE ( W / BOILER ) MEDIUM																	1		
H-33		ELECTRIC STERILIZER ( 40 cm)	1																	0	
H-35		SUCKER MACHINE	1																1	0	
H-36		DIATHERMY SET																	x	Cut since need technical skill	
H-37		DRESSING DRUMS																	x	Cut since low frequent use	
H-38		INSTRUMENT TRAY																	x	Cut since low frequent use	
H-39		PROCTO SCOPE																	x	Already in possession	
H-40		RUBBER CATHETER ( NELATON ) EACH SIZE																	x	Already in possession	
H-41		METAL CATHETER SET																	1	0	
H-42		DISSECTION FORCEPS 130mm																	x	Included in MCHC equipment	
H-43		DRESSING TRAY																	x	Cut since low frequent use	



PC-1	Cord No.	EQUIPMENT LIST	Criteria to include								Criteria to exclude								Final	Remarks	
			1	2	3	4	1	2	3	4	5	6	7	8	Other	Planned Qty	Results				
	H-59	URINAL MALE																	x	Already in possession	
	H-60	URINAL FEMALE																	x	Already in possession	
		MEDICAL TROLLY																	x	Cut since low frequency use	
		I/V STAND																	1	0	
		HISTORY SEET HOLDER																	x	Cut since office equipment	
		BP APPARATUS FIXED ON WALL'S STETHOSCOPE																	1	0	only sphygmomanometer included but stethoscope included in A-02
		Generator																			
	N-08	GENERATOR 50 KVA																	1	0	25-33KVA
		Ambulance with Oxygen and Resuscitator																			
	N-11	4 WD AMBULANCE 4200 cc DIESEL 4 X 4																	1	0	
		Heat Management - Information System at District Level																			
	N-12	COMPUTER and PRINTERS																			Not conditions to use computer date
	N-13	UPS and STABILIZER																	x	Cut since computer equipment	
		Supervision and Monitoring																			
		Supervisory Vehicles for District Health Offices																			
	N-10	4 WD VEHICLE 4200 cc DIESEL 4 X 4																			Not clear purpose of use
		MOSQUIT NET																	1	0	Cut since priority lower
		MYCROSCOPE FOR MALARIA																	1	0	



## **Chapter 2 Contents of the Project**



## **Chapter 2 Contents of the Project**

### **2-1 Objectives of the Project**

Pakistan economy, after the Fifth Five Year Plan (1978/79 – 1982/83) has been launched under the free economy policy, is going on the stable way in spite of the political and social uncertainty after 1989. The major export products including cotton products which occupy 60% of the export merchandise of the country depend on the international market including weather conditions, however, average GDP is 5.1% under the guidance by the World Bank and IMF after 1988. Pakistan, despite its high economic growth rate, has been suffering from low literacy rate (35% in 1990) and high population growth rate (average of the past 5 years is 3.1%), which would be obstacles of future development. As far as looking at current situation of basic health care status of Pakistan, there is a gap between urban and rural areas in health care standard, which should be regarded as a major social and economic problem of the country. Among other provinces, the health status of Balochistan is underdeveloped as its infant mortality rate is higher than national average.

The objectives of the Project are to improve the diagnostic and curative level of the health services for the population of the union councils by supplying essential equipment /instruments to the primary health service providers. The target institutions are BHUs, RHCs (431 BHUs and 47 RHCs as of April, 1997) and DHOs which directly control and supervise those institutions

### **2-2 Basic Concept of the Project**

The health care of Balochistan is administered mainly under the provincial jurisdiction as the central government makes a plan and the provincial government is responsible for management and supervision. Accordingly, education of medical manpower and their allocation plan, and administration of RHCs and BHUs are placed under the responsibilities of the provincial government. Secretary of Health, Provincial Health Department controls teaching hospitals, special hospitals and projects. The Director General Health Services supervise 6 Divisional Health Offices, 26 District Health Offices and District Headquarter Hospitals so that primary and secondary health care services of the provinces are under the control of Divisional Health Offices and District Health Offices.

The Health Referral System of Pakistan is three tier as educational and special hospital for the tertial level, Divisional Headquarter Hospital, District Headquarter Hospital, Tehsil Hospital and Civil Hospital for the secondary level, and Rural Health Center, Basic Health

Unit, Maternal and Child Health Center, Civil Dispensary and Sub Health Center for the primary level.

The area of Balochistan province occupies about 43% of the whole area of Pakistan (approx. 350,000 Km<sup>2</sup>) with sparse population counting only 5.6% of the total (approx. 7.4 mil., 1995). Most of RHCs and BHUs in the province are located in remote areas so that they face various problems such as lack of medical manpower, basic medical equipment, medicines, and necessary facilities (electricity, water, communication), and furthermore insufficient budget allocation from the provincial government exacerbates the situation as essential health care services are not properly provided. Particularly, regarding medical manpower, the allocation pattern of Balochistan does not seem to follow the guideline set forth by the Provincial Health Department. It is a problem of urban-rural-gap that there are not many medical institutions where female doctors work, and in such institutions Lady Health Visitors (LHVs) or Lady Health Workers (LHWs) cover the shortage to some extent.

Under these circumstances, major problems revealed to be solved are:

1. Shortage or obsolescence of basic medical equipment in BHUs and RHCs, insufficient medical manpower, lack of essential infrastructure, and poor health care services available at village level due to obsolete facilities.
2. Health Referral System does not function properly because natural conditions surrounding BHUs and RHCs in remote area make access difficult and limited. This entails economic burden to patients, and hence consequently lessens the possibility of survival.

The basic concept of the Project is designed to address the above three problems aiming at strengthening health care program at provincial and district levels and eliminating the gap between urban and rural areas in medical standard by improving primary health care service in Balochistan. It is expected that the project will consequently contribute to the improvement of primary health care services of Balochistan with reducing maternal and infant mortality rate, and morbidity rate of infectious disease.

This project being made in response to the request by the Government of Pakistan, the Government of Japan dispatched preliminary study mission to Pakistan in June, 1997. The mission made the studies on the background and effect of the feasibility of the project in consideration of the relevant programmes of the country. Upon results made by the mission the Government of Japan decided to conduct a basic design study on the project. The study mission visited some BHUs and RHCs and other related institutions to study the present conditions and to collect data.

As a basic policy on the equipment planning, the following criteria to select equipment and exclude one are agreed with Balochistan government.

Equipment to be included in the Project is:

- 1) equipment to be utilized with ordinary and already established technique,
- 2) equipment whose Operation and Maintenance (O/M) costs can be covered by the Institution,
- 3) equipment required in accordance with the services of the Institution, with the uniformed standard in relation to the type of the institution,
- 4) equipment to be utilized within the present manpower.

Equipment to be excluded from the Project is:

- 1) equipment whose operation requires materials such as flon gas and causes the environmental problems,
- 2) equipment which may be contradictory to the regulations on the waste water / medical wastes treatment and radiation,
- 3) equipment whose O/M costs may exceed the financial capacity of the Institution,
- 4) equipment which requires substantial costs for modification of the facility,
- 5) equipment which requires special technology transfer for operation/utilization,
- 6) equipment also requested to other external assistance agencies,
- 7) equipment of which local agent for maintenance service is not available, and,
- 8) equipment with financial/marketing difficulties on the procurement of consumable and spare parts etc.

Regarding relevant facilities necessary for utilization of the equipment supplied according to the above criteria, it is agreed with Balochistan government that the following points should be taken into consideration.

Criteria to select the Project sites are summarized as follows:

- 1) staff allocation
- 2) physical facility conditions
- 3) medical demand
- 4) catchment area population

There will be no particular problems regarding facilities of project institutions since the equipment to be procured is selected according to the basic policies discussed above. Regarding medical manpower who will be responsible for utilize and maintain the equipment to be procured, there are no problems as only the equipment that can be utilized by the existing medical manpower is selected.

In considering of the above, basic concept of the Project is set to provide essential medical equipment to strengthen the health delivery system of the Province by which every people would be satisfied to have the opportunity to receive adequate basic health care services.

## **2-3 Basic Design**

### **2-3-1 Design Concept**

Design concept for this project is mentioned hereunder as follows.

#### **1) Concept for natural conditions**

Most of Pakistan belongs to mountain areas of Slaimans and Kecltaris leading to the border between Iran and Afghanistan, where the elevation is over 1000m and the land is covered with sand. The coastal areas along the southern border, belonging to sub-tropical dry zone, are also covered with sand. Climate is hot and dry with little rainfall. There are four seasons consisting of summer from April to September, autumn in October, winter from November to February, and spring in March. In summer, temperature goes up to 50°C and in winter down to minus 10°C in some areas. Temperature changes greatly in regions and seasons, therefore packing and transportation need special care. The equipment delivery timing shall be carefully planned and managed to avoid winter season. Dry climate conditions shall be taken note, however, equipment to comply with JIS and BS standard will be acceptable.

#### **2) Concept for social conditions**

Balochistan province is divided into 6 divisions, 26 districts, 58 tehsils and 55 unions etc. The province occupies 43% of total area of Pakistan with only 5.6% of total population. Population density is only 21 persons per Km<sup>2</sup>. Capital city of the province is Quetta, the administrative center of Balochistan, which has about 500,000 of population. Except dwellers in urban areas, most of people have nomadic life style. Majority belongs to Iranian-Balochi tribe speaking Balochi, whose original ancestors were Kurdish living in the southern Iran near Syria. They have tribal society like Patern tribe occupying North West Frontier Province. In some areas of the coastal zone in the south, Black Macfany tribal people live. The tribal problems will affect the works to be made by Japanese at the off-limit areas, for which we shall be sensible and request support both from the Home and Tribal Affairs Department and Health Department.

#### **3) Concept for local agents and their capability and reliability**

In Pakistan, some medical equipment and instruments, such as surgical instruments,

globe, operation table, bed, and dental instruments, are domestically manufactured. They are exported to overseas countries including Europe, Africa, China and Japan. Other medical equipment is mostly imported from Japan, USA, Germany, Britain, China, Poland, and Czechoslovakia. Generator, accessories for X-ray units could be procured from the local market provided that delivery period is secured. Quantitative items, items not available locally and items whose after sales services are required will be purchased from Japan.

4) Concept for administrative capability of the executing agencies of Balochistan

Maintenance of the existing medical equipment in project institutions is managed by Electromedical Workshop (EMW), which is under control of Provincial Health Department. EMW was established under the Third Health Project with aid assistance from ADB and British DFID. Damaged equipment of public hospitals (including RHCs) is repaired by the EMW under the supervision of Balochistan Provincial Health Department and Director General Health Services. The workshop having maintenance instruments and full-time engineers provides actual repair works and conducts 6-month training courses for engineers for 4 branches of the workshop. Two out of five workshops are not functioning properly.

Table 2-1 Outline of Electromedical Workshop

	Institutions	Site	Engineer	Remarks
1.	Head Quarter	Quetta (in Sandeman Provincial Hospital)	Engineer 9 Others 3	Four engineers have been trained in Britain under British ODA.
2.	Branch	Sibi	Engineer 1	Will be functioning
3.	Branch	Khuzdar	Engineer 1 Technician 3	Functioning
4.	Branch	Turbat	Engineer 1 Technician 3	Functioning
5.	Branch	Loralai	Engineer 1	Will be functioning

In case that equipment of RHCs and BHUs is out of order, and a nearby workshop branch is not functioning properly, engineers must be sent from other branches or the headquarter, resulting in long waiting time for repair. It is not always assured that sufficient spare parts are available at the workshop. Therefore, only equipment that does not need special maintenance should be selected to be procured as essential equipment.

As for X-ray plant, engineers appointed by the manufacturers will be sent to provide technical training at the time of the handing-over to local engineers working at the Workshops on maintenance techniques and management. As for electric generators, only technical training at the time of the handing-over is to be given, while the installation is borne by Balochistan Health Department.

### Supply/delivery system of Medical Equipment, Consumables and Medicine

Procurement and supply of medical equipment, consumables and medicines are managed by Medical Store Depot (MSD) under Provincial Health Department. Each District Health Office procures all necessary medical materials and medicines and distributes for relevant BHUs and RHCs from MSD twice a year within the budget given from the Provincial Health Department. Therefore, medical equipment, medicines and consumable (i.e. X-ray films) and fuel (diesel oil etc.) are provided from District Health Offices to BHUs and RHCs. During the survey, it was found that necessary medical consumables and medicines are sufficiently and properly procured and maintained at MSD, and no particular problems are found.

5) Concept for grade of the Equipment to be procured

The Basic Concept of the Project mentioned already, would be reflected for the planning of the level, grade and specifications of the Equipment after consideration of the needs of medical services (yearly number of patients, population of catchment area), the quality and quantity of medical manpower working at the project institutions.

6) Concept for implementation period

It is expected that 12 months would be necessary to implement the project after the signing of the Exchanging of Notes between Pakistan and Japan. The overall Project implementation schedule is shown as the Project Implementation Schedule in 3-1-6 Implementation Schedule hereof.

7) Concept for transportation

Equipment /Instruments will be brought by ocean vessel(s) to Karachi port, and inland transportation therein will be made by vehicles as follows:

- ① Instruments and Equipment: 26 District Head Offices
- ② X-ray which requires installation : 10 RHCs and 2 BHUs
- ③ Ambulances: to be delivered at Quetta

### 2-3-2 Basic Design

(1) Overall plan

The land area of Balochistan province is large, where 431 BHUs and 47 RHCs (as of April 1997) are dispersed in 26 districts in 6 divisions (Kalat, Keich, Nasirabad, Quetta, Sibi, and Zhob). They provide primary health care services. BHU is the terminal health service institution that covers from 4000 to 5000 population in a village, while RHC as an upper institution affiliating 4 to 5 BHUs covers from 15,000 to 20,000 catchment population.



Based on the above consideration, a mission has conducted a survey to grasp medical services and existing equipment of the institutions, and maintenance system of medical equipment by discussing with relevant officials of Balochistan government and visiting project sites. It could not visit some off-limits areas due to security reason, and desert areas in the south due to bad conditions of access roads, however, the mission visited 25 BHUs, 22 RHCs, 5 CD, 6 public hospitals including provincial hospitals, and 20 District Health Offices. According to a provincial health care program, 2 CD and 1 BHU will be upgraded to BHU and RHC respectively every year in each district so that the number of BHU and RHC will increase accordingly.

Interviews to the institutions for the study of manpower allocation, conditions of the existing medical equipment, and physical facilities such as water supply, drainage, electricity and communication system were made. Not only from interviews but also documents collected by the Team from District Health Offices, general information could be obtained including roles of the project institutions, staff allocation, size of beneficiary, and accessibility. The equipment plan was made from the data and information and the analysis made from them.

## (2) Equipment / Instruments Planning

In accordance with the design concepts for the selecting equipment as referred already, essential instruments/equipment for BHUs and RHCs are planned. Additional equipment for BHUs and RHCs are planned also. While, the criteria to select project institutions are as shown in 4) below;

### 1) Equipment planning

Equipment planning was made according to the necessity and relevancy, which were categorized as follows;

- \* Kit comprising of the essential diagnosis items, MCHC items, basic laboratory items for both BHUs and RHCs is planned as shown in Table 2-2,
- \* Equipment necessary to be replaced by the existing X-ray Plant, ambulance, generator etc. for BHUs and/or RHCs are planned as shown in Table 2-3,
- \* Basic laboratory equipment, autoclave, centrifuge, refrigerator, operation set, water filtration tank, IV stand, delivery table, incubator and water bath for RHCs are planned as shown in Table 2-3.

### 2) Selection criteria of Kits and Instruments packages for BHUs and RHCs

The Instruments planned in accordance with above 1) is categorized into 3 packages.

The selection has made according to the staff availability as shown in the table 3-4.

The institution must have at least one of the following essential medical staff to receive Instruments package and further consideration is made according to the quality level of medical services and the completeness of medical manpower. The institutions whose staff is not confirmed are made according to the number of yearly

patients and/or catchment area population of the institutions.

Table 2-2 Instruments Package Criteria

Kit	Composition of Kit	Essential Medical Man-Power						Instruments Package		
		MO	MMT	FMT	LHV	COMP	DAI	1	2	3
A	1) Essential Diagnostic Kit									
	2) First Aid Kit		○			○		●	⊙	○
B	3) MCHC Kit									
	4) Delivery Kit			⊙	⊙		⊙	●	⊙	
C	5) Basic Laboratory Equipment Kit									
	6) Multi Purpose Microscope									
	7) Basic Operation Kit	●						●		
	8) ENT Kit									
	9) Dental Instruments Kit									

Abbreviation : MO : Medical Officer  
 MMT : Male Medical Technician  
 FMT : Female Medical Technician  
 LHV : Lady Health Visitor or Lady Health Worker  
 COMP: Compounder  
 DAI : Dai or Traditional Birth Attendant

3) Selection criteria of additional equipment for BHUs and RHCs

Additional equipment for BHUs and RHCs has planned according to the following criteria as shown Table 2-3. The equipment and instruments selected by the criteria should be provided to the institutions selected in accordance with 4) below.

Table 2-3 Criteria for Additional Equipment

Equipment Name	Criteria
Generator	1) Institutions where X-ray Plant is planned as replacement or new supply however, its electricity is unreliable. 2) Institutions who has X-ray Plant however, electricity is unreliable.
Basic Laboratory Equipment	1) Institutions where Medical Officer is on duty. 2) Institutions where electricity and water supply are available.
Autoclave	1) Institutions where Medical Officer is on duty. 2) Institutions where electricity and water supply are available.
Centrifuge	1) Institutions where Medical Officer and Laboratory Technician are on duty. 2) Institutions where electricity is available.
Refrigerator	1) Institutions where refrigerator to keep medicines is not available. 2) Institutions where electricity is available.
Operation Set	1) Institutions where Medical Officer is on duty. 2) Institutions where electricity is available.

Ambulance	Refer 6) mentioned below
Filtration Tank	1) Institutions where X-ray Plant is planned as replacement or new supply however, its water supply is unreliable.
X-ray Plant	1) Institutions where Medical Officer is on duty however, X-ray plant is not available. 2) Institutions whose X-ray plant is out of order (not repairable).
I/V Stand	1) Institutions where Medical Officer is on duty.
Delivery Table	1) Institutions where FMO, FMT and LHV are on duty.
Spectrophotometer	1) Institutions where Operation set mentioned above is planned. 2) Laboratory technician is on duty.

#### 4) Selection criteria for Project Institutions

Selection of RHCs was made only to exclude the following RHCs. The following selection criteria was made taking into full account the current situations of BHUs and the level and medical personnel in actual position.

To be a Project institution, one of the following two conditions must be fulfilled. Any institutions that do not meet any of the conditions must be excluded.

- (1) It has permanent staff of essential medical manpower
- (2) It receives more than 500 patients a year.
- (3) It covers the catchment area of over 2000 population considering the basic and average population of 2000 to 3000 per institution..

#### 5) Institutions excluded

4 RHCs that have been recently upgraded under the Third Health Project supported by ADB should be excluded as they have already new buildings and equipment provided.

They are:

- |                      |     |           |
|----------------------|-----|-----------|
| (1) Chagai District  | RHC | Dalbandin |
| (2) Loralai District | RHC | Makhtar   |
| (3) Mastung District | RHC | Kanak     |
| (4) Pishin District  | RHC | Khanozai  |

It was confirmed that the following (1) to (3) institutions did not have permanent staff of doctors and essential medical manpower, while (4) and (5) were newly constructed with no equipment and essential medical manpower.

- |         |               |
|---------|---------------|
| (1) BHU | Sailana       |
| (2) RHC | Manikhawa     |
| (3) RHC | Murgha Kibzai |
| (4) RHC | Walakram      |
| (5) RHC | Omzaah        |

The final equipment list includes equipment for 454 BHUs and 60 RHCs accordingly.

Institutions	Number as of April 1, 1997	Number of Institutions as of November, 1997 (time of site survey)	Numbers by Basic Study
RHC	47	68 (inclusive of upgraded institutions)	60
BHU	431	463 (inclusive of upgraded institutions)	454

#### 6) Ambulance

Ambulances planned are mainly for replacement of the ambulance and the vehicle which are already out of order and left as it is because of not repairable. These ambulances are to be utilized for the transfer of the emergency patients to the upper institutions and also for the health activities. Ambulance is considered as important means for regional health services. The purpose of the usage of ambulances under the conditions of the province whose emergency network system has not yet to be organized is to not to go to the accident place where emergency patients are left and to transport to the medical institutions but to just transfer the patients who have been brought by some means, to the nearest hospitals. As previously mentioned in this report, the space occupied by the province is vast, and the catchment area covered by the medical institutions are large. The criteria to select ambulance are ;

For RHCs (Replacement):

- a) Availability of drivers are essential
- b) Relevance such as population increase, the site is on the main road etc. and the ambulance utilization plan data.

For DHOs (New Supply):

- a) Availability of drivers are essential (drivers of DHOs are allotted for the outreach services, however, emergency transfers for patients are anticipated for emergency cases)
- b) Relevance such as the conditions of the districts where ambulances are required

At present, DHOs have vehicles for the National programmes such as EPI and 2<sup>nd</sup> Family Health Project. These vehicles are not equipped with ambulance use. Ambulances for DHO are planned to be used for the services upon request by BHUs and RHCs, which will be utilized in combination with the district hospitals and divisional hospital. The finalization of these ambulances has been made upon detailed consideration on the specifications, utilization plan of the regional /provincial level such as the frequency of the ambulance activities required the service distance. Necessary data is shown as Table 2-4 and 2-5 attached herewith.

Table 2-4 Ambulance Allocation Plan and Present Conditions of DHO/RHC

Figures in ( ) is part of Total Figures

NO.	Division	District	Name of DHO/RHC	No. of Facilities		Curative Care/Year('96/'97)	Catchment Population('1995)	Out of Order	No. of Ambulance		Total	
				BHU	RHC				Order	Planned		
1	KALAT DIVISION	KALAT	KALAT	10	3	34,818	316,787	1	2			
						(7,060)	(25,984)	1	0			4
				21	4	71,892	198,195	0	2			2
				19	3	26,030	424,450	0	3			4
				39	7	30,890	367,566	0	1			2
				18	1	55,188	200,000	2	0			1
2	KEICHI DIVISION	GOWADAR	GOWADAR	6	2	6,540	169,432	0	2			2
				17	4	102,332	160,980	1	2			3
				12	1	57,845	243,149	0	0			1
				24	7	126,678	607,628	3	1			3
						(17,651)	(22,160)	1	0			3
				17	2	181,498	358,670	7	0			1
3	NASHIRABAD DIVISION	JAFFERABAD	JAFFERABAD	26	1	181,498	555,557	3	3			4
				11	2	-	102,995	0	2			3
				15	1	50,000	270,327	0	0			1
						(9,000)	(20,000)	3	0			2
4	QUETTA DIVISION	CHAGAI	CHAGAI	21	2	40,695	186,454	0	2			2
				26	5	108,969	312,227	2	0			1
				29	3	192,410	676,941	1	1			2
				20	2	2,019	272,221	0	0			1
5	SIBI DIVISION	DERA BUGHTI	DERA BUGHTI	24	2	103,016	150,032	0	0			1
						12,947	21,338	1	0			1
						(21,047)	(12,964)	1	0			3
				21	0	28,772	105,050	0	3			4
				15	3	74,690	143,589	1	3			4
6	ZHOB DIVISION	BARKHAN	BARKHAN	5	0	-	147,599	0	1			2
				10	1	20,202	213,403	4	2			3
				32	3	47,219	562,387	3	2			4
						(3,538)	(12,060)	1	0			1
				3	1	41,767	218,156	0	1			2
TOTAL	TOTAL	TOTAL	TOTAL	463	68	531	41	85	8	22	65	

Table 2-5 Ambulance Service Activities in the Ambulance Planned Districts

No.	Districts	Activities by RHC						Activities by DHO						Conditions of each District
		Ambulance		Patient Transfer		Outreach		Drug Transportation		Catchment Population				
		No. of Service/Month	Distance/Service (Km)	No. of Service/Month	Distance/Service (Km)	No. of Service/Month	Distance/Service (Km)	No. of Service/Month	Distance/Service (Km)	1981	1995			
1	KALAT	10-15	230-600	8	338	3	120	1	100	209,149	316,787	2 ambulances are under services at present. This district is situated along the main road between Quetta and Karachi. District hospital has 6 doctors.		
2	KHUZDAL	8-12	700	12	58	2	32	1	25	276,449	424,450	3 ambulances are under services at present. This district is situated along the main road from Quetta to Karachi. Divisional hospital has 12 doctors. Population increase is drastic.		
3	LASBELLA	10-12	320	7	109	3	59	1	80	188,139	367,566	1 ambulance is under services at present. This district is situated in adjacent of Karachi and population increase is drastic.		
4	MASTUNG	4-6	180	5	100	1	30	-	-	132,044	208,000	No ambulances are in service at present. This district is situated on traffic junction between Khera and Karach as well as Quetta Chagai.		
5	GOWADAR	8-10	240-1200	6	900	3	130	-	-	122,385	160,980	2 ambulances are in service at present. Quaid's port city and has difficult road access to Quetta/Karachi. Air lifting is available for patient transfer. District hospital has 7 doctors.		
6	PANIGUR	Ambulance not available								160,750	243,149	No ambulances are in service at present. It has difficult road access to other districts including Quetta/Karachi. Air lifting is available for patient transfer. District hospital has 9 doctors.		
7	KECY	12-14	140	10	850	2	80	1	900	379,467	607,628	1 ambulance is in service at present. Population is increasing drastically. Divisional hospital has 21 doctors.		
8	BOLAN	12-15	100-300	10	300	4	80	-	-	237,123	358,670	No ambulances are in service at present. This district is situated on main road between Quetta and Karachi. Population increase is drastic. District hospital has 4 doctors.		
9	JAFERABAD	8-10	200-400	7	400	1	60	-	-	265,342	555,557	2 ambulances are in service at present. This district is situated on main road between Quetta and Karachi. Population increase is drastic. District hospital has 8 doctors.		
10	JHAL MAGSI	6-8	350-600	4	450	1	110	-	-	68,092	102,995	2 ambulances are in service at present in northern part only except southern part where DHO is located. No district hospital.		
11	NASERABAD	8-10	250-400	6	350	2	120	1	90	129,112	270,327	This district is situated on main road from Quetta to Karachi and adjacent to Sindh Province. No ambulances are in service at present.		
12	PISHIN	8-10	50-150	9	100	2	60	-	-	202,256	312,227	1 ambulance is in service at present. Population increase near Quetta is drastic. This district is situated on the junction between Quetta and Afghanistan. Quetta and Zhob.		
13	QUETTA	4-5	50-100	5	60	1	40	-	-	381,556	676,941	Population increase is drastic, because of Quetta being the Capital city. No ambulances are in service at present. Road conditions are better.		
14	QILA ABDULLAH	Ambulance not available								176,341	272,221	This district is adjacent to Afghanistan and traffic road is heavy because of inflow of refugees and accidents would occur.		
15	DERA BUGHTI	3-4	200-300	3	250	-	-	-	-	103,821	153,032	No ambulances are in services at present. Accidents may happen at Sou. Or. Field. District hospital has 5 doctors.		
16	KOHLU	5-8	500-800	4	350	2	100	1	50	71,269	105,050	No ambulances are in service at present. Patients to transfer to Punjab Province are estimated. District hospital has 6 doctors.		
17	STBI	4-8	200-300	5	150	3	50	-	-	98,482	143,589	4 ambulances are in service at present. This district is situated along main road from Quetta to Karachi and traffic accidents are estimated.		
18	BARKHAN	Ambulance not available								61,686	147,599	No ambulances are in service at present. Traffic accidents are estimated because of the district has access from Punjab Province. No district hospital.		
19	QILA SAIFULLAH	6-8	100-300	4	150	-	-	-	-	138,427	213,403	1 ambulance is in service at present. Traffic accidents are estimated because this district is on the junction from Quetta to Zhob and Quetta to Loralai.		
20	LORAJAI	4-8	400-800	3	350	1	150	-	-	235,038	562,387	1 ambulance is in service at present. Population increase is drastic because of one of the main district in east part of province. District hospital has 16 doctors.		
21	MUSA KHEL	6-8	400-600	4	350	2	150	-	-	91,174	218,156	1 ambulance is in service. Population increase is drastic because of adjacent to Punjab Province. It has no district hospital and only 1 RHC.		
22	ZHOB	5-9	300-700	6	200	1	150	-	-	223,220	344,122	No ambulances are in service at present. Population increase is drastic because of this district is central area of northern part of the province and adjacent to Afghanistan. District hospital has 16 doctors.		

The allocation plan is shown as under.

The priorities A/B/C are;

(A) 1<sup>st</sup> priority (30 vehicles, including 22 DHOs and 8 for RHCs)

(B) 2<sup>nd</sup> priority (25 vehicles, including 2 for DHOs and 23 for RHCs)

(C) lowest priority (20 vehicles)

Table 2-6 Allocation Plan of Ambulances

\* means institutions already driver is allocated

DISTRICT	EXISTING	REQUESTED	PRIORITY		
			A	B	C
KALAT	3 RHC ZARD MONGCHER 1 (out of order/ not repairable) RHC SURAB 1 BIHU MAND HAJI 1	2 RHC ZARD NIBGCGER 1(replacement) DHO 1 for emergency	○*		
KHARAN	1 RHC LADAGASHI 1 (out of order/ not repairable)				
KHUZDAR	3 RHC WADH 2 (1 out of order) RHC ZEEDI 1 SHORANCH	1 DHO/DHOH 1 for emergency	○*		
LASBELLA	1 RHC BELLA 1 (out of order, not repairable)	2 BIHU WINDER 1 (to be upgraded / new supply) DHO/DHOH 1 for emergency	○*	○	
MASTUNG	4 (2 out of order / not repairable)	3 Replacement 2 DHO/DHOH 1 for emergency	○*	○○	
AWARAN	2 RHC AWARAN 1 RHC MASHEE 1	2 BIHU METHIGO 1 (new supply) DHO/DHOH 1 for emergency		○ ○	
GOWADUR	3 RHC JIWANI 1 (out of order, not repairable) RHC ORMARA 1 RHC PASNI 1	3 RHC JIWANI 1 (replacement) BIHU SUR BANDAR 1 (to be upgraded / new supply) DHO 1 for emergency	○*	○ ○	
PANIGUR	N A	2 BIHU GRAM KHAN 1 (to be upgraded / new supply) DHO 1 for emergency	○*	○	
KEICHI	5 RHC NASIRABAD 1 (out of order, not repairable) RHC MAND 1 (out of order) RHC TUMP 1 (out of order) RHC BULEDA 1 (out of order) RHC DASHT KHUDAN 1	2 RHC NASIRABAD 1 (replacement) DHO 1 for emergency	○* ○*		

DISTRICT	EXISTING	REQUESTED	PRIORITY		
			A	B	C
BOLAN	5 District Headquarter Hospital 2 MACH Civil Hospital 1 (out of order/ not repairable) BHAG Civil Hospital 1 (out of order/ not repairable) RHC LEHRI 1 (out of order/ not repairable)	6 MACH Civil Hospital 1 (replacement) BHAG Civil Hospital 1 (replacement) RHC LEHRI 1 (replacement) RHC KHATTAN 1 (new supply) BHU BAKHTAR ABAD 1 (replacement) DHO & BHU KOLPUR 1 for emergency (new supply)	○*	○	○*
JAFFERA-BAD	6 BHU GANDAKHA 1 (out of order, not repairable) MUIHAMMAD Civil Hospital 1 (out of order/ not repairable) RHC ROJUAN JAMALI 1 C/D HAIRUDIN 1 (out of order/ not repairable) BHU SOHBAT PUR 1 DHO 1 for emergency	8 MUIHAMMAD Civil Hospital 1 (replacement) C/D HAIRUDIN 1 (to be upgraded to BHU/ new supply) DHO 1 for emergency 1 (replacement) BHU JANDA TALAB 1 (new supply) BHU CATTLE FARM 1 (new supply) CD MANJI PUR 1 (to be upgraded / new supply) BHU BAGHI HEAD 1 (new supply) CD ZULFIQAR ABAD 1 (to be upgraded / new supply)	○*	○*	○*
JHAL-MAGSI	2 RHC JHALMAGSI 1 RHC GANDAWA 1	1 DHO for emergency 1	○*		
NASFERA-BAD	3 Divisional Headquarter Hospital 2 (out of order/ not repairable) RHC MIR WAH 1 (out of order/ not repairable)	3 DHO and Div. HQH for emergency 1 (replacement) RHC MIR WAH 1 (replacement) BHU CHATTAR 1 (new supply)	○*		○
CHAGAI	2 RHC DALBANDIN 1 RHC NOKUKNDI 1	1 DHO for emergency 1		○	
PISHIN	2 RHC KHANOZAI 1 RHC BARSHORE 1 (out of order/ not repairable)	6 RHC KHANOZAI 1 (replacement) RHC BARSHORE 1 (replacement) DHO/DHQH for emergency 1 (new supply) RHC ALIZAI 1 (new supply) RHC UMARABD 1 (new supply) BHU KALA BAGH BARSHOOR 1 (new supply)	○*	○	○
QUETTA	2 1 out of order / not repairable	5 RHC KICHLAK 1 (new supply) RHC SORRENG COAL MINES 1 (replacement) CD PANJPAI 1 (to be upgraded / new supply) BHU KECHI BEG 1 (to be upgraded / new supply) DHO 1 (replacement)	○*	○	○*
KILLA ABDULLAH	N/A	1 DHO and CHAMAN Civil Hospital 1 for emergency (new supply)	○*		



DISTRICT	EXISTING	REQUESTED	PRIORITY		
			A	B	C
DERA BUGHTE	2 RHC BAIKER 1 (out of order/ not repairable) RHC SUI 1 (out of order/ not repairable)	3 DHO/DHQH for emergency 1 (new supply) RHC BAIKER 1 (replacement) RHC SUI 1 (replacement)	○*		
KOHLU	3 DHQH 2 (2 out of order/ not repairable) MAIWAND Civil Hospital 1 (out of order/ not repairable)	3 DHO and DHQH for emergency 2 (replacement) MAIWAND Civil Hospital 1 (replacement)	○*		○*
SIBI	5 HARNAI Civil Hospital 2 (1 out of order/ not repairable) DHQH 2 RHC LUNI 1	3 RHC SHARIGH 1 (replacement) CD TALLI 1 (to be upgraded / new supply) DHO 1 for emergency (new supply)	○*		○
ZIAPAT	3 RHC ZIARAT 2 (1 out of order/ not repairable) RHC KAWAS 1 (out of order/ not repairable)	3 RHC KAWAS 1 (replacement) BHU KACH 1 (to be upgraded / new supply) DHO 1 for emergency 1 (new supply)	○*	○	○
BARKHAN	N A	1 DHO and Civil Hospital 1 for emergency (new supply)	○*		
KILLA SAIFULLA II	6 (4 out of order/ not repairable) BHU KOZH KACH I MUSLIM BAGH Civil Hospital 1	3 RHC BADINI 1 (new supply) DHO 2 for emergency (replacement)	○*	○*	○*
LORALAI	6 RHC MEKHAR 1 RHC SINJAVI 1 (out of order/ not repairable) DUXI Civil Hospital 1 ZHOB DIVHQH 3 (1 out of order/ not repairable)	5 RHC ISMAIL SHEAR 1 (new supply) C/D MANIZAI 1 (new supply) C/D WAHVI 1 (new supply) RHC SINJAVI 1 (replacement) DDHO/DHQH 1 (replacement)	○*	○*	○
MUSA KHIL	1 RHC MUSA KHIL 1	1 DHO for emergency 1	○*		
ZHOB	3 (2 out of order/ not repairable)	5 RHC MANI KHAWA 1 (replacement) RHC MURGHA KIBZAI 1 (replacement) RHC WALA AKRAM 1 (new RHC) RHC OMZAAH 1 (new RHC) DHO /DHQH for emergency 1	○*		○*
TOTAL	71	75	30	25	20

### 7) Wireless Transceiver Set

The following conditions were considered for the wireless transceiver set;

- Radio licensing application/approval
- Future communication plan in corporation with the health delivery system and emergency network system of the province

In consideration of the above points it was decided that the wireless set be excluded from the equipment list for the Project.

The following tables show the finalization of the equipment / instruments by item-wise and institution-wise.

Table 2-7 Equipment / Instruments List

Kit	Item No.	Name of Kit	Contents of Equipment	Objectives	Total Qty	Site
Basic Instruments / Equipment for BIU/RHC						
A	1	Essential Diagnostic Kit	(1) Diagnostic Kit Stethoscope Hammer Sphygmomanometer(Aneroid) Laryngoscope (2) Weighing Scale for Adult Weighing Scale for Infant (3) BP Apparatus Fixed on Wall Sphygmomanometer(Mercurial)	Use for basic diagnosis like beriberi, heart beating, Blood-Pressure and weight.	514	BIU RHC
	2	First Aid Kit	(1) First Aid Set Identification Material Set Resuscitator(Infant/Adult) Foot Suction Pump Bandages and Sanitary Set Portable Case	Use for accident and disaster. Also to resuscitate on the way of transportation like in the ambulance.	514	BIU RHC
B	3	MCHC Kit	(1) D&C Set, TBAs Kit Metal Catheter Various Forceps Vaginal Speculum with Retractor (2) Gynecological Birth Calendar Obstetric Stethoscope Measuring Tape Virginal Speculum (3) Treatment Set Vaginal Forceps Virginal Speculum Tray	Use to keep mother and child health services at local area.	498	BIU RHC
	4	Delivery Kit	(1) Delivery Set Hemostasia Forceps Catheter Glycerin Enema Syringe	Use for home delivery (by TBA).	498	BIU RHC
C	5	Basic Laboratory Equipment Kit	(1) Laboratory Set Pipette Stand Clinical Refractometer Albuminometer Alcohol Lamp Micro Slide Glasses Reagent Glass	Use for basic clinical test like blood and urine test for out patient.	253	BIU RHC
	6	Multi Purpose Microscope	(1) Multi Purpose Microscope	Use for basic test of blood and to analyze malaria insect.	253	BIU RHC
	7	Basic Operation Kit	(1) Basic Operation Set Instruments Set (knife, forceps, scissors, needle) (2) Sterilizer	Use for basic operation and treatment.	253	BIU RHC
	8	E.N.T. Kit	(1) E.N.T. Ophthalmo Set Ophthalmoscope Otoscope Laryngoscope Tongue Depressor Spot light	Use for basic E.N.T. diagnosis.	253	BIU RHC
	9	Dental Instruments Kit	(1) Dental Instruments Set Pliers, Nipper etc.	Use for basic dental treatment.		BIU RHC

Kit	Item No.	Name of Kit	Contents of Equipment	Objectives	Total Q'ty	Site
	10	Others for BHU	(1) X-Ray Plant (300mA) Developing System (Manual) Film Illuminator(1 Film) (2) Generator (25-33KVA) (3) Water Filtration Tank (0.5 t)	Use for upgrading of diagnosis for BHU which have same level of doctor and X-ray facility. To be provided with generator, developing system, Film illuminator and water filtration tank.	2	BHU
<b>Additional Equipment for RHC</b>						
	11	Generator (25-33KVA)		Use for the keeping electricity for X-ray plant and general electrical operated medical equipment.	22	RHC
	12	Spectrophotometer		Use for the basic check for primary common diseases	30	RHC
	13	Autoclave		Use for sanitary control of operation room equipment.	35	RHC
	14	Electric Centrifuge		Use for sample test.	30	RHC
	15	Refrigerator		Use for the keeping sample, reagent and vaccine etc.	41	RHC
	16	Operation Set	(1) Mobile Operation Lamp w/ B (2) Operation Theater Table (3) OT Instruments	Use for minor operation.	33	RHC
	17	Ambulance	(1) 4WD (Box Type) (2) 4WD (Pick up Type)	Use for transportation of patients RHC to DHQH etc. and use to transport patients and to contact between RHC and DHIO.	8 22	RHC DHO
	18	Water Filtration Tank (0.5 t)		Use for keeping pure water for Developing system for X-ray Plant	7	RHC
	19	X-Ray Plant (300mA)	(1) X-Ray (300mA) (2) Developing System(Manual) (3) Film Illuminator (1 Film)	Use for patient who needs x-ray examination.	10	RHC
	20	I/V Stand		Use for Infusion.	45	RHC
	21	Delivery Table		Use for delivery inside institutions	3	RHC
	22	Basic Laboratory Equipment	(1) Incubator (2) Water Bath	Use for Basic Laboratory test.	9	RHC
	23	Workshop Maintenance Tool		Use for periodical and routine maintenance works	5	EM WS

(as of December, 1997)

Table 2-8 Conditions of BHUs / RHCs and Overall Equipment / Instruments

Date are per from:  
 (1) Anesthetics Overhaul/insurances received.  
 (2) Anesthetics collected by the Local Assistant.  
 (3) Letters provided by Health Dept. G.O.B.

Remarks:  
 \* Means Sites visited.  
 (a) Means Sites not visited but Anesthetics for Overhaul/insurances received.  
 (b) Means Sites excluded by Site Survey.  
 (c) Means Sites included by Site Survey.  
 (d) Means Instruments to be supplied by the Concerned to exist Sites.

B H U C	District Name	Name of RHC/BHU	Activity		Staff Member													Utility Conditions					Kts. for BHU / RHC										Proposed Equipment to be Procured																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
			Out-patients Care /Year 1998/97	Catchment Area Population	Site Excluded	1 N	2 M	3 F	4 X	5 L	6 D	7 C	8 D	9 A	10 O	11 R	12 A	13 H	14 A	15 O	16 R	17 I	18 M	19 V	20 I	21 P	22 E	23 R	24 E	25 R	26 E	27 R	28 E	29 R	30 E	31 R	32 E	33 R	34 E	35 R	36 E	37 R	38 E	39 R	40 E	41 R	42 E	43 R	44 E	45 R	46 E	47 R	48 E	49 R	50 E	51 R	52 E	53 R	54 E	55 R	56 E	57 R	58 E	59 R	60 E	61 R	62 E	63 R	64 E	65 R	66 E	67 R	68 E	69 R	70 E	71 R	72 E	73 R	74 E	75 R	76 E	77 R	78 E	79 R	80 E	81 R	82 E	83 R	84 E	85 R	86 E	87 R	88 E	89 R	90 E	91 R	92 E	93 R	94 E	95 R	96 E	97 R	98 E	99 R	100 E	101 R	102 E	103 R	104 E	105 R	106 E	107 R	108 E	109 R	110 E	111 R	112 E	113 R	114 E	115 R	116 E	117 R	118 E	119 R	120 E	121 R	122 E	123 R	124 E	125 R	126 E	127 R	128 E	129 R	130 E	131 R	132 E	133 R	134 E	135 R	136 E	137 R	138 E	139 R	140 E	141 R	142 E	143 R	144 E	145 R	146 E	147 R	148 E	149 R	150 E	151 R	152 E	153 R	154 E	155 R	156 E	157 R	158 E	159 R	160 E	161 R	162 E	163 R	164 E	165 R	166 E	167 R	168 E	169 R	170 E	171 R	172 E	173 R	174 E	175 R	176 E	177 R	178 E	179 R	180 E	181 R	182 E	183 R	184 E	185 R	186 E	187 R	188 E	189 R	190 E	191 R	192 E	193 R	194 E	195 R	196 E	197 R	198 E	199 R	200 E	201 R	202 E	203 R	204 E	205 R	206 E	207 R	208 E	209 R	210 E	211 R	212 E	213 R	214 E	215 R	216 E	217 R	218 E	219 R	220 E	221 R	222 E	223 R	224 E	225 R	226 E	227 R	228 E	229 R	230 E	231 R	232 E	233 R	234 E	235 R	236 E	237 R	238 E	239 R	240 E	241 R	242 E	243 R	244 E	245 R	246 E	247 R	248 E	249 R	250 E	251 R	252 E	253 R	254 E	255 R	256 E	257 R	258 E	259 R	260 E	261 R	262 E	263 R	264 E	265 R	266 E	267 R	268 E	269 R	270 E	271 R	272 E	273 R	274 E	275 R	276 E	277 R	278 E	279 R	280 E	281 R	282 E	283 R	284 E	285 R	286 E	287 R	288 E	289 R	290 E	291 R	292 E	293 R	294 E	295 R	296 E	297 R	298 E	299 R	300 E	301 R	302 E	303 R	304 E	305 R	306 E	307 R	308 E	309 R	310 E	311 R	312 E	313 R	314 E	315 R	316 E	317 R	318 E	319 R	320 E	321 R	322 E	323 R	324 E	325 R	326 E	327 R	328 E	329 R	330 E	331 R	332 E	333 R	334 E	335 R	336 E	337 R	338 E	339 R	340 E	341 R	342 E	343 R	344 E	345 R	346 E	347 R	348 E	349 R	350 E	351 R	352 E	353 R	354 E	355 R	356 E	357 R	358 E	359 R	360 E	361 R	362 E	363 R	364 E	365 R	366 E	367 R	368 E	369 R	370 E	371 R	372 E	373 R	374 E	375 R	376 E	377 R	378 E	379 R	380 E	381 R	382 E	383 R	384 E	385 R	386 E	387 R	388 E	389 R	390 E	391 R	392 E	393 R	394 E	395 R	396 E	397 R	398 E	399 R	400 E	401 R	402 E	403 R	404 E	405 R	406 E	407 R	408 E	409 R	410 E	411 R	412 E	413 R	414 E	415 R	416 E	417 R	418 E	419 R	420 E	421 R	422 E	423 R	424 E	425 R	426 E	427 R	428 E	429 R	430 E	431 R	432 E	433 R	434 E	435 R	436 E	437 R	438 E	439 R	440 E	441 R	442 E	443 R	444 E	445 R	446 E	447 R	448 E	449 R	450 E	451 R	452 E	453 R	454 E	455 R	456 E	457 R	458 E	459 R	460 E	461 R	462 E	463 R	464 E	465 R	466 E	467 R	468 E	469 R	470 E	471 R	472 E	473 R	474 E	475 R	476 E	477 R	478 E	479 R	480 E	481 R	482 E	483 R	484 E	485 R	486 E	487 R	488 E	489 R	490 E	491 R	492 E	493 R	494 E	495 R	496 E	497 R	498 E	499 R	500 E	501 R	502 E	503 R	504 E	505 R	506 E	507 R	508 E	509 R	510 E	511 R	512 E	513 R	514 E	515 R	516 E	517 R	518 E	519 R	520 E	521 R	522 E	523 R	524 E	525 R	526 E	527 R	528 E	529 R	530 E	531 R	532 E	533 R	534 E	535 R	536 E	537 R	538 E	539 R	540 E	541 R	542 E	543 R	544 E	545 R	546 E	547 R	548 E	549 R	550 E	551 R	552 E	553 R	554 E	555 R	556 E	557 R	558 E	559 R	560 E	561 R	562 E	563 R	564 E	565 R	566 E	567 R	568 E	569 R	570 E	571 R	572 E	573 R	574 E	575 R	576 E	577 R	578 E	579 R	580 E	581 R	582 E	583 R	584 E	585 R	586 E	587 R	588 E	589 R	590 E	591 R	592 E	593 R	594 E	595 R	596 E	597 R	598 E	599 R	600 E	601 R	602 E	603 R	604 E	605 R	606 E	607 R	608 E	609 R	610 E	611 R	612 E	613 R	614 E	615 R	616 E	617 R	618 E	619 R	620 E	621 R	622 E	623 R	624 E	625 R	626 E	627 R	628 E	629 R	630 E	631 R	632 E	633 R	634 E	635 R	636 E	637 R	638 E	639 R	640 E	641 R	642 E	643 R	644 E	645 R	646 E	647 R	648 E	649 R	650 E	651 R	652 E	653 R	654 E	655 R	656 E	657 R	658 E	659 R	660 E	661 R	662 E	663 R	664 E	665 R	666 E	667 R	668 E	669 R	670 E	671 R	672 E	673 R	674 E	675 R	676 E	677 R	678 E	679 R	680 E	681 R	682 E	683 R	684 E	685 R	686 E	687 R	688 E	689 R	690 E	691 R	692 E	693 R	694 E	695 R	696 E	697 R	698 E	699 R	700 E	701 R	702 E	703 R	704 E	705 R	706 E	707 R	708 E	709 R	710 E	711 R	712 E	713 R	714 E	715 R	716 E	717 R	718 E	719 R	720 E	721 R	722 E	723 R	724 E	725 R	726 E	727 R	728 E	729 R	730 E	731 R	732 E	733 R	734 E	735 R	736 E	737 R	738 E	739 R	740 E	741 R	742 E	743 R	744 E	745 R	746 E	747 R	748 E	749 R	750 E	751 R	752 E	753 R	754 E	755 R	756 E	757 R	758 E	759 R	760 E	761 R	762 E	763 R	764 E	765 R	766 E	767 R	768 E	769 R	770 E	771 R	772 E	773 R	774 E	775 R	776 E	777 R	778 E	779 R	780 E	781 R	782 E	783 R	784 E	785 R	786 E	787 R	788 E	789 R	790 E	791 R	792 E	793 R	794 E	795 R	796 E	797 R	798 E	799 R	800 E	8



- (1) Assessment Quantities received.  
 (2) Amounts submitted by the Local Authority.  
 (3) Lists provided by Health Dept, GDB.

Date as per form:

- (a) Means Sites visited.  
 (b) Means Sites not visited but Assesses for Quantities received.  
 (c) Means Sites excluded by Site Survey.  
 (d) Means Sites to be completed by the Officers to submit Sites.

Remarks:

B H U V	District Name	Name of RHC/BHU	Activity	Cumulative Care /Year 1966/67	Site Excluded	Staff Member													Utility Conditions										Proposed Equipment to be Procured																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
						Custodian	Population	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080



















