

**STUDY ON ENHANCEMENT OF DISTRICT HEALTH SYSTEM  
FOR  
BENI PREFECTURE  
IN  
THE REPUBLIC OF BOLIVIA**

**FINAL REPORT  
MAIN REPORT**



**FEBRUARY 2003**

SYSTEM SCIENCE CONSULTANTS INC.

**SSS**

**JR**

**03-38**

## CONTENTS OF FINAL REPORT

### SUMMARY

### MAIN REPORT (including APPENDIXES)

### ANNEXES (Annex 1 and 2)

- Annex 1 Questionnaire for Monitoring on Pilot Study, Result of Education/ Training for 2 Hospitals in Trinidad, Result of Education/ Training for 2 CSs and Medical Boat, Own Evaluation Report on Pilot Study
- Annex 2 Result of Water Quality Survey, Detail Data of Facilities and Medical Equipment on Pilot Study, Equipment List and Building Plans for the Improvement Project of Health/ Medical Facilities based upon the Master Plan

"APPENDIXES" were prepared as "supporting documents", and "ANNEXES" were prepared as "Data Books".

#### Foreign exchange rate

US\$ 1.00 = Bs. 7.5 in January 2003  
(Main Report 12. Project Cost and Evaluation)

US\$ 1.00 = 135 Japanese Yen in January 2002  
(Main Report 11. Proposed Technical Cooperation)

## PREFACE

In response to a request from the Government of Republic of Bolivia, the Government of Japan decided to conduct a study on Enhancement of District Health System for Beni Prefecture in the Republic of Bolivia and entrusted the study to Japan International Cooperation Agency (JICA).

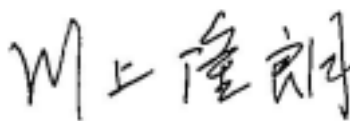
JICA selected and dispatched a study team headed by Mr. Tateo Kusano of System Science Consultants Inc., and composed of its members to Bolivia, four times between June 2000 and February 2003.

The team held discussions with the officials concerned of the Government of Republic of Bolivia and conducted field surveys at the study area. Based on the field surveys, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of the health condition of Beni Prefecture and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Bolivia for their close cooperation extended to the study.

February 2003



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Takao Kawakami  
President  
Japan International Cooperation Agency

February 2003

Mr. Takao Kawanami  
President  
Japan International Cooperation Agency  
Tokyo, Japan

Letter of Transmittal

We are pleased to submit to you the report on the Study on Enhancement of District Health System for Beni Prefecture in the Republic of Bolivia.

The report contains the results of the work and investigation carried out by the Study Team from June 2001 to February 2003 with the advice and assistance from the relevant Japanese and Bolivian officials.

In this Study, the current conditions and development issues of the health system in the Beni Department were investigated and clarified. Based on the findings of these investigations, the Study Team proposed a Master Plan of the Integrated Regional Health System.

We wish to express our deep appreciation and gratitude to the personnel concerned of your Agency, La Paz and Santa Cruz offices, Embassy of Japan in La Paz, the Ministry of Foreign Affairs, and the Ministry of Health, Labour and Welfare. We also wish to express our sincere gratitude to the concerned officials of the Vice-Ministry of Public Investment and External Finance/Ministry of Finance, Ministry of Health and Social Provision, the Prefecture of Beni Department, and municipal governments of the Beni Department, for their close cooperation and assistance extended to the Team during the Study.

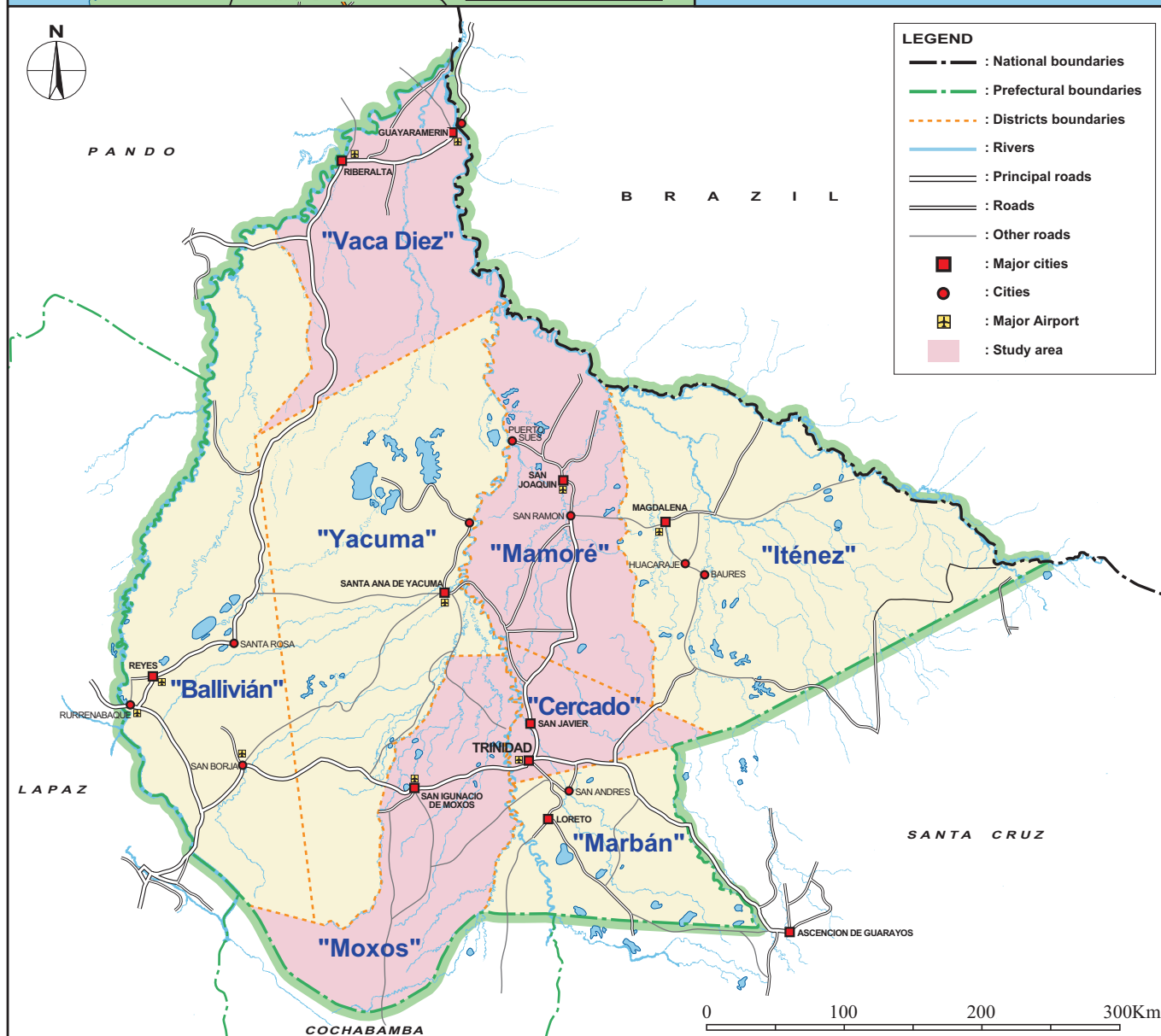
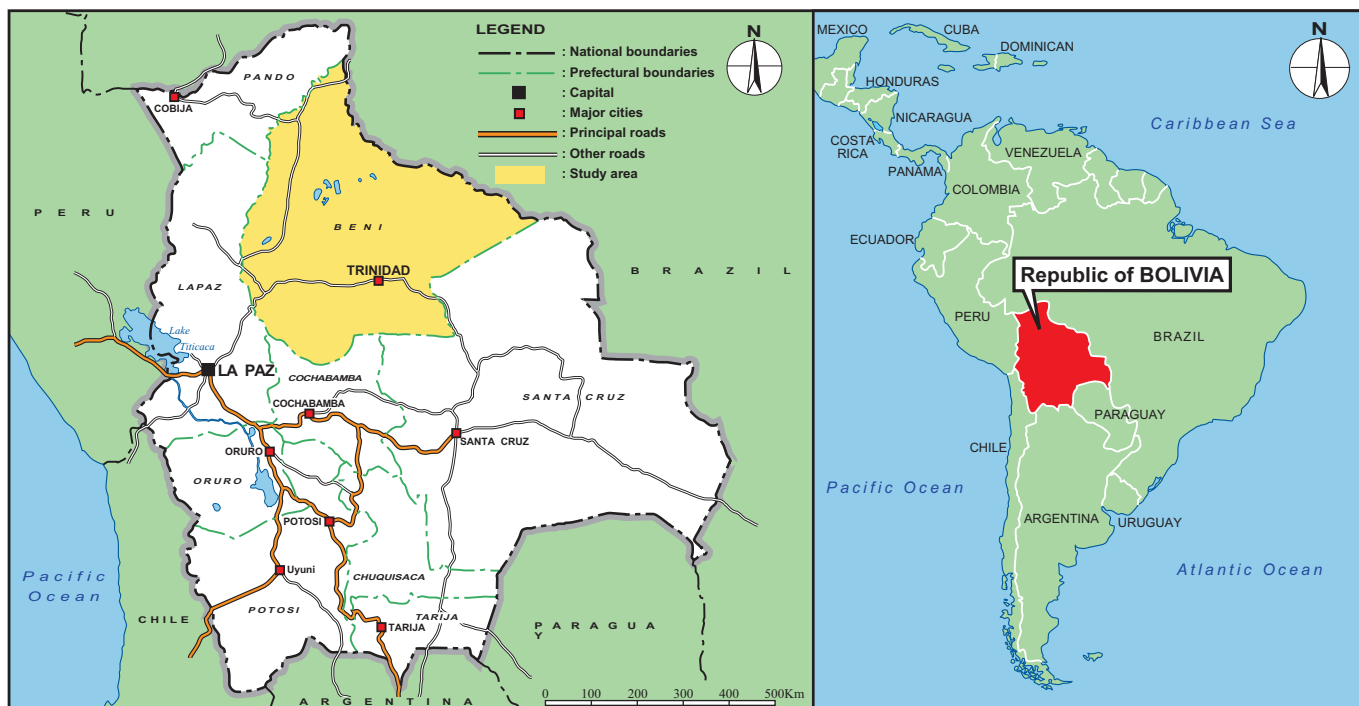
Very truly yours,



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Tateo Kusano  
Team Leader for the Study on Enhancement of  
District Health System for Beni Prefecture





**MAP OF THE STUDY AREA**





Figure: Location of Cities/ Communities with Health Facilities in Cercado Province  
STUDY ON ENHANCEMENT OF DISTRICT HEALTH SYSTEM FOR BENI PREFECTURE IN THE REPUBLIC OF BOLIVIA

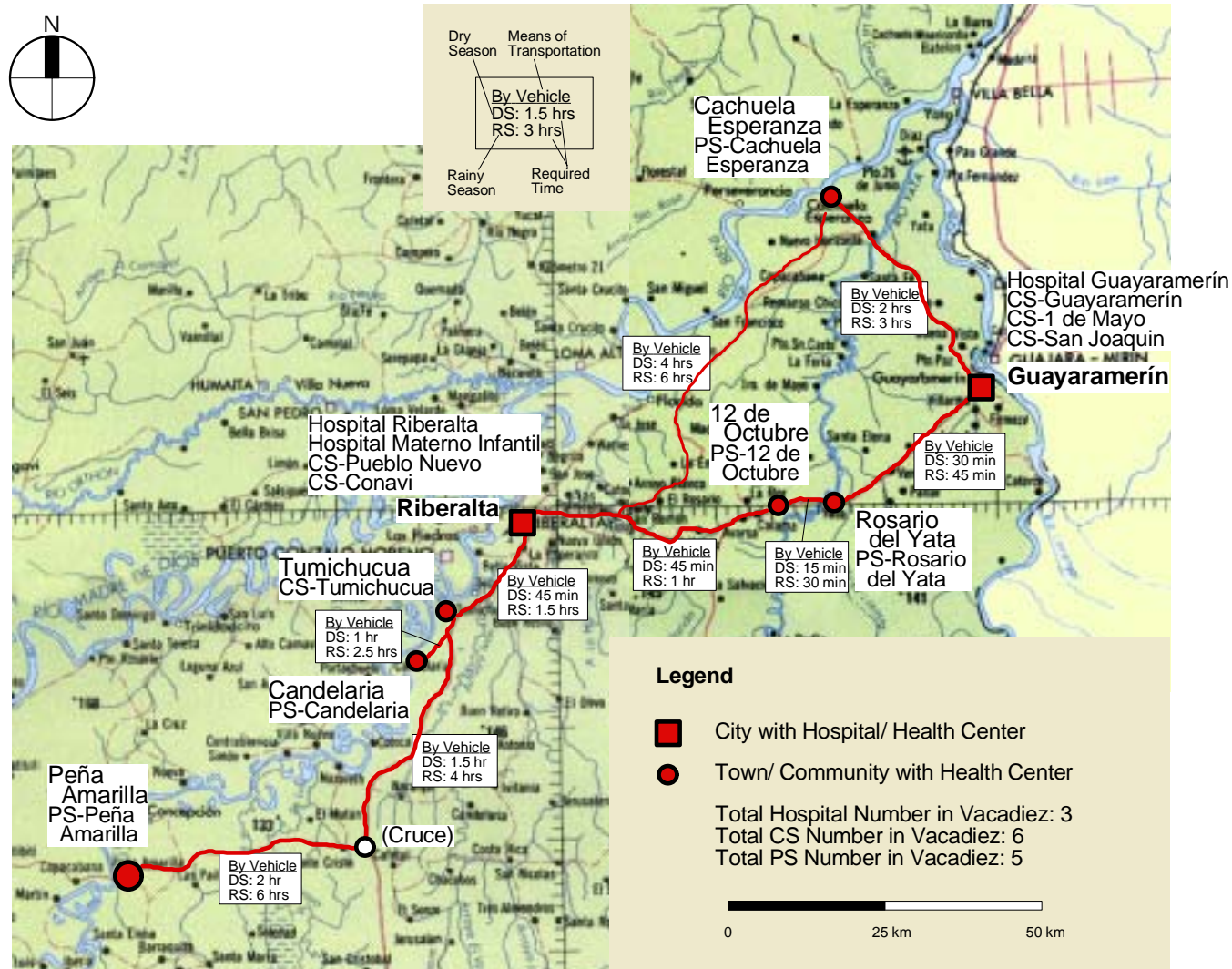












**Figure: Location of Cities/ Communities with Health Facilities in Vacadiez Province**  
 STUDY ON ENHANCEMENT OF DISTRICT HEALTH SYSTEM FOR BENI PREFECTURE IN THE REPUBLIC OF BOLIVIA

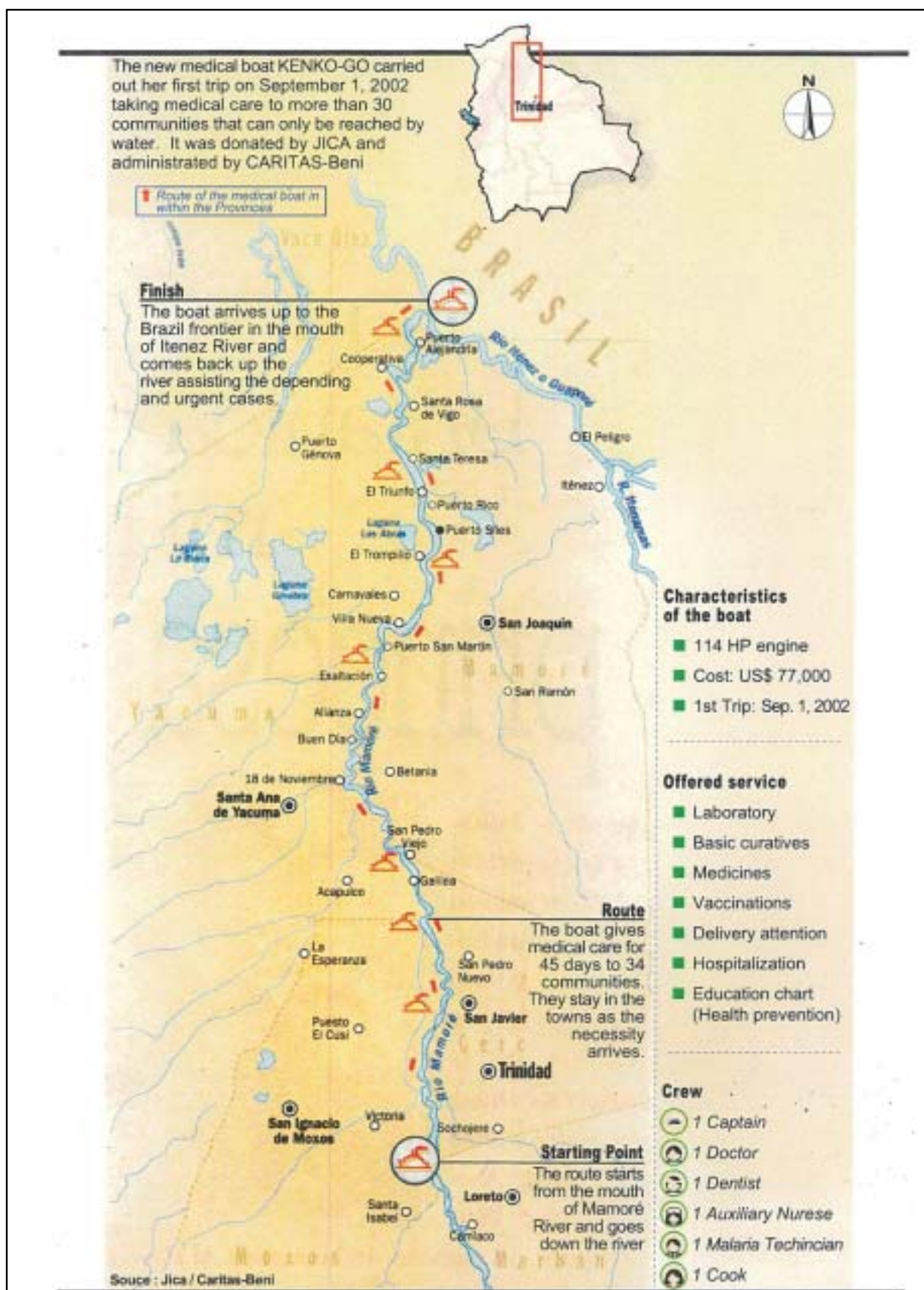


Figure: Navigation Route through the Amazon Area by Medical Boat (Pilot Study)  
STUDY ON ENHANCEMENT OF DISTRICT HEALTH SYSTEM FOR BENI PREFECTURE IN THE REPUBLIC OF BOLIVIA



Vaca Diez Province



■ **Guayaramerín:**  
**Hospital Guayaramerín**

This hospital is a main general hospital but not able to afford to diagnose due to insufficient of equipment.



■ **Guayaramerín:**  
**Centro de Salud**

This CS locates in the urban area therefore its health service is active.



■ **Guayaramerín, Rosario de Yata:**  
**Puesto de Salud**

This PS locates between Guayaramerín and Riberalta, and stands nearby the river. 1-doctor and 1-nurse manage this PS.



■ **Riberalta:**  
**Hospital Riberalta**

This general hospital covers area widely for tertiary care. Due to the support of JOCV, laboratory has optimal technology.



■ **Riberalta:**  
**Hospital Materno Infantil**

This hospital covers nearly 80% of the delivery in this municipality.



■ **Riberalta, Conavi:**  
**Centro de Salud**

This CS is located in the center of the municipality, and they are active for EPI and family promotion.

Mamoré Province



■ **Riberalta, Pueblo Nuevo:**  
**Puesto de Salud**

This CS is located at the edge of the municipality, and they are active for EPI and family planning promotion.



■ **San Joaquin:**  
**Ex.CS-Hospital Henry K. Beye**

There are 3-doctors and 6-nurse, and having the function of dental care and laboratory. They have to cover wide consultation as main health facility.



■ **San Joaquin:**  
**Ex.CS-Hp / Edificio Nuevo**

To cover this remote area, facility is required to have wider function than usual CS. Recently FPS has constructed new building.



Mamoré Province



■ **San Ramón:**  
**Ex CS-Hospital San Ramón**  
This health facility covers wider consultation.



■ **San Ramón:**  
**Ex CS-Hp / Edificio Nuevo**  
Due to the activity, FPS recently has constructed the building but no equipment supplied.



■ **Puesto Siles:**  
**Centro de Salud**  
This is CS but widely covers patients coming through the river.

Moxos Province



■ **San Ignacio:**  
**Ex-CS-Hospital 3 de Noviembre**  
It takes 2 hours by car from Trinidad but takes 6 hours in the rainy season. This requires here as more function than usual CS.



■ **Santísima Trinidad:**  
**Puesto de Salud**  
Totally isolated area, only a doctor and a nurse support local Iindirenas by regularly traveling by boat.

Cercado Province



■ **Trinidad:**  
**Hospital German Busch**  
Though its role is a tertiary care, their facility is quite poor, instead of enthusiasm of the staff.



■ **Trinidad:**  
**Hospital Materno Infantil**  
In 1982 this facility has been constructed by Japanese Grant Aid. Facility itself keeps quite good condition but equipment has become superannuated.



■ **Cipriano Barace:**  
**Centro de Salud**  
This is located at the edge of the center and covers near residents.

## Cercado Province



■ **Villa Vecinal:**  
**Centro de Salud**

This is located out of center city and covers poverty residents. Despite of its needs, facility and equipment is quite poor.



■ **San Javier:**  
**Centro de Salud**

It takes 30 min. by car in the dry season, but it takes 3hrs. in the rainy season or no access to Trinidad city. Equipment and drug are covered optimally.



■ **San Pedro Nuevo:**  
**Puesto de Salud**

Much further than San Javier, difficult access to the city. Activity of this PS is closed temporary due to the absence of last auxiliary nurse.



■ **San Vicente:**  
**Centro de Salud**

This CS supplies health services to new residents from rural. Facility itself is recently built.



■ **Trinidad:**  
**Auxiliary Nursing School**

This is auxiliary nursing school is located in the northern part of city. Most of graduates find jobs in Beni.



■ **Trinidad:**  
**Nursing Course-Technical Univ.**

As one of the faculty of health science, this course has 5 years education. Nevertheless, educational equipment is old and poor.

## Medical Boat



■ **CARITAS (NGO) Boat**

Though its role is a tertiary care, their facility is quite poor, instead of enthusiasm of the staff.



■ **CARITAS Boat Consultation**

Inside of the boat, there are general clinic and dental care. The tour takes about one month to go round. The content of treatment is mainly first aid, maternal & child care and health promotion.



## Pilot Project

### Training for 2 Hospitals by Hospital Universitario Japonés



#### ■ Presentators and Participants of Trainig

11 presentators (10 doctors and 1 licensed nurse) were prepared for this training workshop.



#### ■ Hospital Universitario Japonés

Hospital Universitario Japonés is located in the east side of Santa Cruz City, and it was founded by Japanese Grant Aid.



#### ■ Condition of Training Workshop

Training was conducted in Hospital Universitario Japonés for 1 week in July 2002. Total 10 staffs from Hospital Presidente German Busch and Hospital Materno Infantil participated in this training.

### CS Nueva Trinidad



#### ■ General View of CS Nueva Trinidad

CS building was completed in the middle of July 2002 (construction period was approx. 3 months).



#### ■ Dental Consultation Room



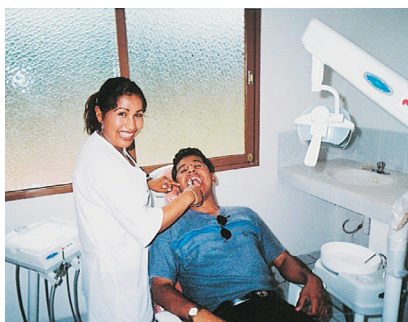
#### ■ General Consultation Room

### CS Santísima Trinidad



#### ■ General View of CS Santísima Trinidad

CS building was completed in the middle of August 2002 (construction period was approx. 3.5 months).



#### ■ Dental Consultation Room



#### ■ Isinuta River

On the way to Santísima Trinidad from Villa Tunari, 3 big rivers obstruct the smooth transportation especially in the rainy season.



## Pilot Project

### Medical Boat "KENKO-GO"



#### General View of the Medical Boat

Ship-building of the Medical Boat was completed in the middle of July 2002. The Medical Boat carried out 2 trips of mobile clinic service during the Pilot Study.



#### Home Port: Puerto Almacen

Medical Boat is mooring at Puerto Almacen during the rainy season. In dry season, it change the home port to Los Puentes.



#### Rudder Room

Rudder room is located on the 3rd floor.



#### Engine Room

The capacity of diesel engine is 114 CV.

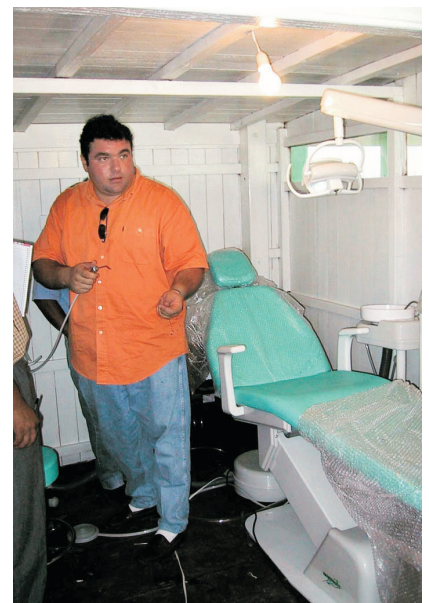


#### Top Floor



#### Barge Boat

Medical Boat is equipped with a aluminum barge boat.



#### Dental Consultation Room

Same type dental chair kit as CS Nueva Trinidad and Santísima Trinidad was installed in the Medical Boat.

## SUMMARY

### 1 Introduction

#### (1) Background of the Study

The Republic of Bolivia is a landlocked country located between 10 degrees and 23 degrees South, has an area of 1,098,581km<sup>2</sup> (3 times as large as Japan) with a population of 8,274,225 (Census 2001), and is also known as one of the poorest countries in Latin America.

Bolivia continues to promote popular participation and decentralization laws, as it maintains its policies on free economy.

The Bolivian government of Gonzalo Sanchez de Lozada has launched “Bolivia Plan = Action Plan (1997-2002)” with the purpose to alleviate poverty. In the medical and public health sector, it aims to reduce by half under-five mortality rate and maternal mortality rate, addressing policies on a) introduction of Basic Health Insurance, b) improvement of nutritional status, c) infectious disease control (e.g., Chagas' disease, malaria, tuberculosis). It has target health indexes for the target year 2002 concretely, that is to say, a) reduction of maternal mortality rate (50% reduction of 1997's rate of 390/100,000), b) reduction of under-five's mortality rate (50% reduction of 1997's rate of 105/1,000), c) improvement of nutritional status of under-three (50% reduction of 1997's number of 208,000 persons), d) improvement of accessibility to health unit (from 1997's rate of 34% to 85%), e) improvement of immunization status of under-five (from 1997's rate of 85% to 90%), f) reduction of infection rate of malaria (from 1997's rate of 35/1,000 to 8/1,000).

Beni Department occupies 213,000km<sup>2</sup>, 20% of the nation's total land, and has approximately 365,000 people (2001 Census) that account for the second lowest population density in the country. The annual population growth rate in Beni is rather high at 3.16%, while that of the urban areas is 5.19%, and the rural areas 0.43%, showing a remarkable trend of migration from rural areas to urban centers.

Three major illnesses in Beni are ARI, malaria and ADI. Three major causes of death are heart disease, ADI and pneumonia. ADI, ARI and malnutrition account for high infant mortality rate. Maternal mortality rate is also high, though the rate of rural areas is twice as high as that of urban areas. Major causes of maternal mortality are hemorrhage, eclampsia and unsafe abortion.

In Beni prefecture, along with the central government and municipal government, donors such as USAID, UNICEF, CIDA, WHO/PAHO, UNFPA and NGOs, are implementing health sector projects. There is still no comprehensive department and/or district health plan. Coordination among donors will be expected in planning and project implementation.

In response to the request of the Government of the Republic of Bolivia, the Government of Japan decided to conduct the Study on Enhancement of District Health System for Beni Prefecture in the Republic of Bolivia. The Japan International Cooperation Agency (JICA) dispatched a preparatory study team in January 2001 and Scope of Work (S/W) for the Study was signed on 25th January 2001.

The Study Team (JST) has been dispatched by JICA to Beni department from the end of June 2001 to start the activities of the Study.

- (2) Objectives of the Study
  - 1) To formulate a Master Plan on the enhancement of district health system for Beni Prefecture for the target year 2010, and to formulate priority program(s) identified in the Master Plan, which will be able to contribute to the development of the health decentralization process;
  - 2) To pursue technology transfer to the counterpart personnel in the course of the Study.
- (3) Study Area  
Beni Department.
- (4) Study Approach
  - 1) Phase I Study
    - a. Analysis of the existing conditions of socio-economic background and demand for and supply of health services
    - b. Formulation of Master Plan on the district health system and stagewise implementation plan
    - c. Selection and identification of the priority programs for the Pilot Study in Phase II
  - 2) Phase II Study  
Development of the priority programs through the implementation and monitoring of the Pilot Study.

## **2 Problems and Constraints of the Existing District Health System**

Major problems on health situation will be summarized as follows,

### **(1) Natural conditions**

The geographical and meteorological conditions affect the health conditions and transport conditions, by characterizing the disease structure and accessibility from house to health service facilities.

### **(2) Area coverage of health services**

Medical health service area covered by PS/CS and hospitals is limited by lack of road conditions and means of transportation, transportation cost/time and low health service quality level as well as socio-cultural barriers.

### **(3) Institution and Organization**

#### **1) Coverage of Health Insurance (Seguro Básico de Salud: SBS)**

Service of medicine distribution by SBS is inadequate because of lack of institutional linkage among hospitals/CS/PS, SEDES and municipal governments and limited knowledge of inhabitants.

#### **2) Municipal Policy and Administration**

- a. PDM and POA have not yet shown a clear-cut development policy and action plan on health sector reform.
- b. The municipalities have little interest in the health sector.

- c. Health services to the poverty area have not been well organized or promoted due to lack of poverty alleviation policy at the municipal level.

3) Coordination System

No effective and active coordination system has been observed among agencies concerned regarding the health sector.

(4) Human Resources

Allocation of ITEM numbers by different professional categories is not adequate to address the imbalance of demand for and supply of health services and to solve inaccessibility and unavailability for inhabitants. The reasons include:

- lack of selection criteria
- poor decision making process
- poor monitoring /evaluation system
- insufficient incentive for medical staff to remote areas

(5) Cost Sharing

- 1) Supply side: ITEM (Refer to the remark blow), SBS and O&M budget is not optimally allocated amongst relevant agencies and its management is inappropriate.
- 2) Demand side: medical cost is not set considering the beneficiaries' willingness to pay.

Remark: ITEM and additional ITEM by HIPC II

The personnel/ human resources of the public health service are assigned and distributed by professional category (doctor, nurse, auxiliary nurse and paramedic etc.) by MSPS through ITEM. The position, qualification and place of assigned health unit for each personnel are described in ITEM. MSPS determines ITEM allocation based upon the local SEDES's request. Take a condition of Cercado for instance, "ITEM number of doctors and nurse in Cercado as of 2000 are 76, and 26 respectively."

In addition to above mentioned regular ITEM, from 2002, Bolivian Government started to assign "additional ITEM by HIPC II" which was born after the establishment of National Dialogue Law 2002 (Law No. 2235: July 31, 2001). Under this law, the Municipal Solidarity Fund was constituted for the school education and the public health with the purpose of making up for the deficit that accumulated until 2001 of ITEM for the educational personnel and the medical personnel and paramedics. DUF constituted under the Ministry of Finance started to distribute the additional ITEM from 2002. Take a condition of Cercado for instance again, "Additional ITEM number of doctor and nurse allocated to Cercado in 2002 are 4 and 12 respectively, and the total ITEM number of doctor and nurse that consist of regular ITEM and additional one are 80 and 38 respectively."

(6) Facilities/ Equipment

- 1) The scale of existing facilities is not adequate for the demand.
- 2) Allocated health staff and the scale of health facilities are unbalanced especially in case of CS/PS.
- 3) Equipment at health facilities is insufficient or obsolete.
- 4) No data for existing equipment (inventory, operation manual, etc.) are available.

(7) Hospital Management

- 1) Management of hospitals as well as CS/PS is still inadequate due to poor quality control of human resources, accounting, medicine inventory and patient data, and lack of education/ training.
- 2) Hospitals' role for district health management is not fulfilled.

(8) Medicines

- 1) There is no existence of effective and timely medicine distribution system.
- 2) There is no control system on stock and use of medicine supplied by SBS and other sources.
- 3) Inhabitants, health workers and medical-health staff have not well been provided and trained on the knowledge of medicine use.
- 4) Despite the government effort to control the medicine prices at a low level, the market mechanism raises the prices unaffordable for users.

(9) SNIS

Information system has been introduced to collect, process, and disseminate health information by SNIS. However, institutional capacity at all levels (PSs/CSs, hospitals, municipalities and SEDES) to collect and process data has not yet developed, and SNIS' capability to analyze the data for the identification of major causes of diseases is inadequate. Also, insufficient environment e.g., lack of information processing devices, underequipped laboratories, makes an impediment for efficient implementation.

(10) Referral System

The current referral system is not effective due to lack of coordination amongst health levels, and the health personnel are not interested in coordinating activities with other facilities.

(11) PHC

- 1) The current PHC model is not effectively enforced due to minimal interest of the health personnel.
- 2) There is no integrated health management approach (e.g., IMCI) for mothers and children.
- 3) Coordination amongst different primary health care programs, and between primary health care programs and other health programs is not implemented.

(12) Epidemiological Approach

- 1) Beni Department has distinct ecological and geographical conditions with different kinds of vectors.
- 2) CENETROP limits its activities to certain diseases. There is little linkage with CENETROP and health facilities in Beni.
- 3) The weakness of disease control program lies in technology, equipment and financial and human resources.

(13) Community Health

- 1) Integration of Western and traditional health services is not optimized for lack of recorded data on traditional practices (home care).
- 2) TBAs and voluntary organization related to health promotion (e.g. Mother's club) are not integrated into public health services.
- 3) The people do not apply better practices for social, cultural and economic reasons (e.g., people do not boil water because they cannot afford, they do not like the taste, or do not want to invest the time).



- 4) IEC on sanitation, nutritious control, SBS is not effective.
- 5) Health has lower priority than education and income generation in communities.
- 6) Community drug management with micro credit is not widely practiced.
- 7) Poor social participation in the health sector due to poor organization and activities of local committees and lack of leadership.

**Table S-1 Allocation of Medical Staff for 1,000 Inhabitants and Balance of Doctor and Nurse (2000, 2002)**

	Inhabitant (A)	Number of Doctor				Number of Nurse				(B+C)/A <sup>*3</sup>	C/B <sup>*4</sup>
		Medical Doctor	Dentist	Sub Total(B)	B/A <sup>*1</sup>	Nurse	Auxiliary Nurse	Sub Total (C)	C/A <sup>*2</sup>		
Cercado	83,014 <sup>*5</sup> (85,631) <sup>*6</sup>	76 <sup>*7</sup> (80) <sup>*8</sup>	8 (9)	84 (84)	1.01 (1.04)	26 (38)	121 (137)	147 (175)	1.77 (2.04)	2.78 (3.08)	1.75 (1.97)
Trinidad	78,940 (81,429)	75 (79)	8 (9)	83 (88)	1.05 (1.08)	26 (36)	120 (132)	146 (168)	1.85 (2.06)	2.90 (3.14)	1.76 (1.91)
San Javier	4,074 (4,202)	1 (1)	0 (0)	1 (1)	0.25 (0.24)	0 (2)	1 (5)	1 (7)	0.25 (1.67)	0.49 (1.90)	1.00 (7.00)
Vaca Diez	114,594 (118,207)	50 (63)	9 (9)	59 (72)	0.51 (0.61)	16 (19)	122 (144)	138 (163)	1.20 (1.38)	1.72 (1.99)	2.34 (2.26)
Riberalta	73,673 (75,996)	31 (39)	6 (6)	37 (45)	0.50 (0.59)	11 (12)	75 (87)	86 (99)	1.17 (1.30)	1.67 (1.89)	2.32 (2.20)
Guayaramerín	40,921 (42,211)	19 (24)	3 (3)	22 (27)	0.54 (0.64)	5 (7)	47 (57)	52 (64)	1.27 (1.52)	1.81 (2.16)	2.36 (2.37)
Ballivián	71,637 (73,896)	15 (22)	4 (4)	19 (26)	0.27 (0.35)	8 (11)	23 (39)	31 (50)	0.43 (0.68)	0.70 (1.03)	1.63 (1.92)
Reyes	10973 (11,319)	4 (6)	1 (1)	5 (7)	0.46 (0.62)	3 (4)	5 (10)	8 (14)	0.73 (1.24)	1.18 (1.86)	1.60 (2.00)
San Borja	37,939 (39,135)	4 (4)	1 (1)	5 (5)	0.13 (0.33)	2 (3)	9 (13)	11 (16)	0.29 (0.41)	0.42 (0.54)	2.20 (3.20)
Santa Rosa	8,779 (9,056)	2 (5)	1 (1)	3 (6)	0.34 (0.66)	2 (2)	4 (7)	6 (9)	0.68 (0.99)	1.03 (1.66)	2.00 (1.50)
Rurrenabaque	13,946 (14,386)	5 (7)	1 (1)	6 (8)	0.43 (0.56)	1 (2)	5 (9)	6 (11)	0.43 (0.76)	0.86 (1.32)	1.00 (1.38)
Yacuma	27,495 (28,362)	8 (12)	2 (2)	10 (14)	0.36 (0.49)	2 (6)	15 (23)	17 (29)	0.62 (1.02)	0.98 (1.52)	1.70 (2.07)
Santa Ana	21,341 (22,014)	7 (11)	2 (2)	9 (13)	0.42 (0.59)	2 (6)	14 (22)	16 (28)	0.75 (1.27)	1.17 (1.86)	1.78 (2.15)
Exaltación	6,154 (6,348)	1 (1)	0 (0)	1 (1)	0.16 (0.16)	0 (0)	1 (1)	1 (1)	0.16 (0.16)	0.32 (0.32)	1.00 (1.00)
Moxos	22,038 (22,733)	7 (12)	2 (3)	9 (15)	0.41 (0.66)	1 (3)	21 (25)	22 (28)	1.00 (1.23)	1.41 (1.89)	2.44 (1.87)
San Ignacio	22,038 (22,733)	7 (12)	2 (3)	9 (15)	0.41 (0.66)	1 (3)	21 (25)	22 (28)	1.00 (1.23)	1.41 (1.89)	2.44 (1.87)
Marban	15,225 (15,736)	3 (5)	1 (1)	4 (6)	0.26 (0.38)	0 (3)	10 (10)	10 (13)	0.66 (0.83)	0.92 (1.21)	2.50 (2.17)
Loreto	3,794 (3,914)	2 (2)	1 (1)	3 (3)	0.79 (0.77)	0 (1)	9 (9)	9 (10)	2.37 (2.55)	3.16 (3.32)	3.00 (3.33)
San Andrés	11,461 (11,822)	1 (3)	0 (0)	1 (3)	0.09 (0.25)	0 (2)	1 (1)	1 (3)	0.09 (0.25)	0.17 (0.51)	1.00 (1.00)
Mamoré	12,36 (12,753)	8 (12)	2 (2)	10 (14)	0.81 (1.10)	1 (2)	13 (15)	14 (17)	1.13 (1.33)	1.94 (2.43)	1.40 (1.21)
San Joaquín	5,489 (5,663)	5 (9)	1 (1)	6 (10)	1.09 (1.77)	1 (2)	6 (8)	7 (10)	1.28 (1.77)	2.37 (3.53)	1.17 (1.00)
San Ramón	5,838 (6,022)	2 (2)	1 (1)	3 (3)	0.51 (0.50)	0 (0)	6 (6)	6 (6)	1.03 (1.00)	1.54 (1.49)	2.00 (2.00)
Puerto Siles	1,035 (1,068)	1 (1)	0 (0)	1 (1)	0.97 (0.94)	0 (0)	1 (1)	1 (1)	0.97 (0.94)	1.93 (1.87)	1.00 (1.00)
Itenez	18,886 (19,482)	7 (13)	3 (3)	10 (16)	0.53 (0.82)	3 (4)	24 (25)	27 (29)	1.43 (1.49)	1.96 (2.31)	2.70 (1.81)
Magdalena	9,902 (10,214)	4 (10)	2 (2)	6 (12)	0.61 (1.17)	2 (3)	9 (10)	11 (13)	1.11 (1.27)	1.72 (2.45)	1.83 (1.08)
Baures	5,285 (5,452)	2 (2)	1 (1)	3 (3)	0.57 (0.55)	1 (1)	5 (5)	6 (6)	1.14 (1.10)	1.70 (1.65)	2.00 (2.00)
Huacaraje	3,699 (3,816)	1 (1)	0 (0)	1 (1)	0.27 (0.26)	0 (0)	10 (10)	10 (10)	2.7 (2.62)	2.97 (2.88)	10.00 (10.00)
	365,281 (376,800)	174 (219)	31 (33)	205 (252)	0.56 (0.67)	57 (86)	349 (418)	406 (504)	1.11 (1.34)	1.67 (2.01)	1.98 <sup>*9</sup> (2.00) <sup>*10</sup>

Remarks	*1 Number of doctors per 1,000 inhabitants
	* Number of nurses per 1,000 inhabitants
	*3 Number of medical staffs per 1,000 inhabitants
	*4 Number of nurses for one doctor
	*5 Number of inhabitants in 2001
	*6 Assumption of inhabitants in 2002, based on annual growth rate of population from "Table__Population by Municipality in Beni (1992,2001,2010)"
	*7 Number of medical staff in 2000
	*8 Number of medical staff in 2002, based on the New ITEM
	*9 Upper section in the table shows year of 2000
	*10 Lower section in the table shows year 2002
Sources:	*5 Preliminary outputs of the Census 2001, INE
	*7 Statistics of SEDES, Trinidad, 2001 January
	*8 Application of Increment of Personnel for District for the Administration of the 2002. SEDES, Trinidad (Ley del Dialog. HIPC II)

### **3 General Outline of the Master Plan**

#### **3.1 Goals of the Master Plan**

Regional health system will be developed to establish an area-wise health service network system in Beni department under the framework of the current law No. 2426 by 2010. Each level of health facilities and organizations should be closely connected and linked for a health model based upon PHC strategies, and the reduction of morbidity and mortality will be promoted to improve the health conditions of inhabitants in poverty areas as well as urban centers. Master Plan is composed of a sector-wise program and an area-wise program.

#### **3.2 Basic Principles of Development Strategies for Achieving Goals**

##### **(1) Basic Development Principles**

- 1) Effective and equal distribution of the regional health system should be achieved under the decentralization and popular participation policy. This system will contribute to poverty alleviation.
- 2) Effective allocation and equal distribution of the limited human and financial resources will be indispensable to solve the management problems of hospital, CS-hospital and CS/PS and to contribute to poverty alleviation in each municipality. For this purpose, these resources will be redistributed and/or integrated according to the balance of health service demand and supply.
- 3) Inter-municipal health service network system will be developed to establish the effective resource allocation and to cover the isolated poverty areas based upon the past experience of donors and NGOs.
- 4) The proposed system should be operated and managed as sustainable development system by various organizations concerned in health services and supported by central and local governments. The proposed regional health system will be applied to the other provinces by selective manners in the future. Donors and NGOs will be expected to participate in the implementation of the proposed system through the well-organized inter- agency committee in Beni.

##### **(2) Development Strategies**

In Beni department, it is difficult to promote impromptu improvement for the regional health system because the system itself is still under development because of the lack of coordination/ partnership between institutions/ organizations concerned. Therefore, the proposed regional health system will be implemented by a stage-wise approach. In the short-term basis, major focus will be placed on strengthening, expansion and upgrading of the institution and infrastructure of the health service system established by MSPS/SEDES, prefecture/municipal governments, NGOs and donors in the past. In the medium and long-term basis, the new organization and construction of infrastructure will be considered.

- 1) Short term strategies: to improve the operation and management of the existing institution/organization and infrastructure/equipment of the regional health system through the re-allocation and redistribution of the limited human and financial resources.
- 2) Medium and long-term strategies: to increase and to relocate human and financial resources and to construct new infrastructure and to install the new equipment to meet the balance of demand and supply through the inter-agencies committee in the national and/or international levels.

### **3.3 Master Plan of the Integrated Regional Health System**

Four target provinces of Study area, Vaca Diez, Cercado, Mamore and Moxos, has a population of 231,404, which is about 65% of the total Beni population, 365,281 (2001 Census). The plan primarily seeks formation of a regional health system in these provinces and its outcome will be applied to the whole Beni area. The regional health system consists of i) core hospitals for medical health service, ii) CSs for PHC service and iii) OTB (Refer to the remark below) / Community for medical health service network. When the regional health system is organized, it is necessary for the Beni prefecture to form its coordination system of regional health system based on the principles of decentralization and popular participation, as prioritized in the national policy. In order to realize the coordination system, four model projects on regional health system are proposed for the purpose of addressing the adverse conditions in which impoverished inhabitants of the four provinces live. The models are health service system of hospitals on i), CSs and OTB/ Community on ii) and iii).

The Master Plan consists of sector- (target-) wise approach that seeks to address health issues specific to Beni, and area-wise approach that attends to urban and rural areas individually. The area-wise approach focusses on the four provinces that are highly populated and will design regional development plans of Northern, Central and Southern areas of the department.

“Mancomunidad” system (an inter-municipality) should be introduced and aimed at planning and implementing projects of comprehensive regional health system.

Remark: OTB (Basic Territorial Organization)

After the promulgation of the Popular Participation Law of No. 1551, 1994, Bolivian social and administrative situations have been essentially changed. Under this law, organized people can directly participate in their own municipal development with a good control over the economic resources of each municipal government. OTB is defined as basic unit of community for popular participation. OTBs are recognized as juridical personality through the required legal procedure of registration. All the urban and rural population in a determined territory have the right to establish an OTB. Only one OTB is allowed in one community.

#### **(1) Sector-wise Approach**

Sector-wise plan will be proposed for various issues of the regional health system in Beni.

- 1) Solution of constraints from natural conditions
- 2) Area coverage of health services
- 3) Institution and Organization
- 4) Human Resources
- 5) Cost Sharing
- 6) Facilities/ Equipment
- 7) Hospital Management
- 8) Medicines
- 9) SNIS
- 10) Referral System
- 11) PHC
- 12) Epidemiological Approach
- 13) Community and Family Health

Implementation bodies, their activities and benefits are shown as follows according to each sector plan.

**Table S-2 Implementation Bodies, Activities by the Implementation Bodies and Benefit of the Regional Development Plans**

Sector	Implementati on bodies	Activities by the implementation bodies	Beneficiaries and Benefits
1. Solution of constraints from natural conditions	This plan is covered by the other following sector plans.		
2. Area coverage of health services			
(1) Area coverage (Improvement of accessibility)	CS/ OTB/ Community	Direct/ indirect service coverage of medical staff is expanded by development of transportation and communication network system around CSs.	Cost/time savings by radio system without heavy investment for transport network, i.e., bridge/road and river transport system
(2) SUMI coverage	-ditto- Municipality /SEDES	Timely and adequate care of pregnant women and infants is achieved through promotion by medical staff to OTBs/ communities and inhabitants. Particularly female medical staff are allocated in order to alleviate social constraints among women in poor area.	Decrease of maternal and infant mortality rate by increased acceptance of preventive care and by mitigating gender-related constraints at the CS consultation (more effective SUMI)
3. Institution and Organization			
(1) Administration at Prefecture and municipality	Prefecture/municipality	The formulation of regional health system in Beni requires coordination and cooperation among relative agencies. A coordination and supervision committee at the prefecture level and, for more routine communications, a committee at the municipal level is established.	Cost/time savings of health services by effective assignment of responsibilities in each administrative organization and establishment of equal distribution of health services
(2) Institution and organization at medical organization	Municipality / Medical organization (Hospital, CS)	Hospitals/ CSs and a municipal-level committee build close relationship and improve SUMI's medicine supply and service application. For smooth progress of these tasks, Annual Operation Plan in the health sector is prepared by municipalities.	Cost/time savings at the hospital and CS level, and increased health services to beneficiaries
4. Human Resources			
(1) Distribution of human resources	MSPS/ SEDES/ Municipality	Despite the tight budget condition, ITEM of MSPS was allocated. In addition, additional ITEM by HIPC II, which focuses on poverty alleviation, was allocated in 2002. Details of ITEM usage in Beni should be documented and fair and transparent recruiting system of staff should be established. Standardized labor conditions of medical staff are formed at the hospital/ CS levels and upgrades the quality of health service	Equal distribution and effective use of the limited human resources of health service without political intervention
(2) Effective use of human resources	MSPS/ SEDES/ Municipality / Medical organization	Human resource allocation and labor conditions are monitored, the results of which will be the basis of supervision/ re-education of medical staff.	Effective use of the allocated human resources and more contribution to poorer beneficiaries

5. Financial resources and Cost Sharing			
(1) Revenue	MSPS/ SUMI/ Municipality / Medical organization/ OTB/ Community	Although the revenue of hospitals/CSs mainly depends on their own medical service and SUMI subsidy, the amount of income from medical services is not stable as more patients are poor and/or bankrupt. In order to augment account balance of the medical service, attracting clients from different socio-economic strata and building patients' willingness to pay are important.	Revenue increase by improved willingness to pay by the inhabitants and securing of SUMI fund
(2) Expenditure	-ditto-	The cost of personnel, materials/ consumables and maintenance takes up much of the expenditure. The medical staff's remuneration is almost fully financed by the two types of ITEMs, namely MSPS (SEDES) and HIPC II, which makes it imperative to secure such funds. Medicines, consumables and maintenance are covered by municipalities' budget.	Better financial management by securing ITEM by MSPS and HIPC II for medical staff salaries and SUMI for medicines
(3) Funding	Medical organization/ CEASS/ NGO/ OTB/ Community	A revolving fund to enable well-timed procurement of medicine will be broadly established. This purchasing scheme will be effective in evading delayed payment from municipalities.	Effective health services and health improvement by timely fund arrangement for medicine and O&M
(4) O&M cost saving	Medical organization	In an attempt to reduce maintenance cost for medical equipment, technician's skills for inspection/ repair will be improved and cost sharing of municipalities will be arranged as shown in 6.(2).	Cost saving and better health service by better maintenance of medical equipment
(5) Cost sharing among agencies concerned	Municipality / Donors/ NGO	Securing costs for fuel and foodstuff for the Medical Boat operation requires assistance by donors and NGOs as well as municipal governments.	Health improvement for the isolated inhabitants through inter-municipal services of the medical boat
(6) Annual plan	Medical organization/ municipality	The above financial arrangements will be managed through the preparation of systematic annual and monthly budget and statement.	Establishment of sustainable financial management
6. Facilities/ Equipment			
(1) Facilities construction / equipment supply	MSPS/ Municipality / Donor	Previous medical facilities and equipment supply was concentrated in the urban area while medical facilities/ equipment in urban poverty area and rural area is kept at a poorer level. In amending such a gap between urban and rural areas, the physical conditions and use of the existing medical facilities/ equipment of core hospitals in cities, facilities/ equipment of CSs in poverty area are improved.	Increased distribution of health service to the poverty area
(2) O&M of medical equipment	Medical organization/ Private sector	Rather than staffing a permanent technician in each health facility, on-demand repair/ maintenance service by an independent institution (such as a hospital with capacity to deliver such services or the supplier of equipment that includes after-sales service) will be sought.	Effective use and cost saving of the facilities and equipment

7. Hospital Management	Medical organization	Hospital management will be strengthened through the hospital management committee that centrally makes decisions. Responsibilities of each department will be defined, inter-departmental communication will be reinforced, and efficient/ effective management system for budgeting, auditing, service delivery and administration will be established. It is essential to provide constant education and training so as to achieve the quality to serve as a core hospital in the regional health system.	Effective use of the limited human and financial resources and more benefit to patients
8. Medicines			
(1) Medicines supply	Medical organization/ SEDES/ CEASS/ Municipality	Medicines in hospitals/ CSs are supplied by a dual procedure; authorization by SEDES and payment by municipalities. It is proposed that health organizations acquire necessary medicines in a timely manner by a credit system.	Cost/time saving and effective use of medicine
(2) Medicines management	Medical organization	A series of medicine management system from request, procurement, use, to storage of medicines is formed through enhancing credit system. Constant education and training on medicine use and management is implemented to medical staff as well as inhabitants and health workers.	
9. SNIS			
(1) Data quality	Medical organization/ SEDES/ CENETROP	Institutional capacity at all levels to collect and process data for information system has not yet developed. As such, constant re-education and strengthening of laboratory examinations are conducted by SEDES, CENETROP, etc.	Effective disease control by better medical treatment
(2) Data availability	SEDES/ Medical organization/ OTB/ Community	In rural communities, patients do not visit health facilities or the health facility simply lacks effective means to access information of inhabitants. Thus mortality of pregnant women and infants is difficult to comprehend. Therefore cooperation and coordination between communities and CS should be enhanced.	
(3) Information feedback system	MSPS/ SEDES/ Medical organization	A system will be established to send back to hospitals and CSs the data SEDES and MSPS collected, to support medical staff and enable effective use of SNIS.	
10. Referral System			
(1) Staff consciousness of hospital	Hospital	The hospital staff's consciousness as the core health institution is enhanced through active consciousness-raising and communication with NGOs and other organizations. The hospital should better attend patients referred from a CS/PS.	Promotion of referral system by active decision making by medical staff on referral and counter-referral –effective resource use and reduction of disease and mortality rate
(2) Referral system from CS to hospital	CS	The CS accepts patients as many as possible, publicizes referral system to clients and swiftly refers patients, who need higher-level attention, to a hospital.	

(3) Counter-referral from hospital to CS	Hospital/CS	After operating intensive care, hospital counter-refers patients to a CS based on the counter referral system. This is an ideal referral system between a hospital, CSs and community for effective regional health system.	
11. PHC	SEDES/OTB/Community/NGO	SEDES has been implementing PHC as a national program. In addition, PHC implementation system is formed under the coordination of CS and NGOs. This arrangement will improve the linkage of PHC activities and overlaps will be eliminated. Constant education/ training for NGOs by SEDES is promoted.	Cost saving by reduction of overlaps of health services among agencies concerned and expansion of beneficiaries
12. Epidemiological Approach			
(1) National program	MSPS/SEDES/Medical organization/OTB/Community	With exhaustive national program, the function of examination in a hospital/ CS is intensified.	Effective implementation and expansion of beneficiaries of the national program by experienced personnel and financial resources of SEDES, hospitals and CSs
(2) Laboratory	CENETROP	Constant education/ training by CENETROP in Santa Cruz and cooperation system for examination are formed.	Suitable medical treatment by clarification of the cause of disease by laboratory test
13. Community and Family Health			
(1) OTB/Community	OTB/Community/CS	Under the initiative of OTBs and communities such as the health committee, mother's club and credit organization, communication between them and medical staff in a CS is strengthened. This enables to coordinate traditional medical skills and modern medical health technology and to employ human/ social resources of both sides effectively.	Cost savings by the government and increase of employment opportunity in the communities
(2) Primary health services by CS	CS/OTB/Community	Primary health service, of which the CS bears a central role, is constructed through allocating CS medical staff living near communities, communicating with inhabitants and understanding the local health situation.	More effective CS by being proximate to the inhabitants thereby minimizing social barrier between inhabitants and the CS
(3) Annual plan	CS/OTB/Community	Annual operative plan for health service at the OTB level is prepared under the supervision of the CS medical staff. Planning and implementing POA provides strong relationship between OTB and CS.	Effective use of public health service by communities through active participation in the health service planning.

#### Remarks 1: SUMI and DILOS

The Bolivian Government has newly introduced the expanded public insurance for maternal and infant health, SUMI (Seguro Universal Materno Infantil: Law No. 2426) that replaced the SBS at the end of 2002. To secure health service under SUMI, the government has also organized the Local Health Board named DILOS (Directorio Local de Salud) in each municipality for the health administration in place of District Health. According to the Law No. 2426, 10% of annual municipal budget and additional 10% from central government will be allocated to DILOS which consists of 3 members, i.e., City Mayor, SEDES representative and OTB (Surveillance Committee) representative. DILOS is responsible for the health administration including the operation/ maintenance of health/ medical facilities in each municipal jurisdiction.



## (2) Area-wise Approach

Target study areas consist of four provinces. The areas are divided into a group of two provinces with core hospitals, and another of two provinces without core hospitals but with CSs/ ex-CS hospitals, and the riverside area with difficult access to hospitals and CSs.

### 1) North zone (major area coverage - Vaca Diez province and neighboring Pando department)

Hospitals in Riberalta and Guayaramerin will function as the health service base of this northern part of Beni department and the neighboring Pando department. One of these hospitals will be upgraded to the 2nd level hospital as the top referral in the North Zone. Health centers in the urban and rural areas of this zone will be closely connected and linked with these hospitals.

### 2) Central zone (major area coverage - Cercado province and neighboring Yacuma and Marbán provinces)

Hospital services should be integrated and upgraded to be the 2nd or 3rd level hospitals in Beni department. Trinidad is a major absorbing area of the poor from rural areas not only in Cercado province but the provinces of Beni department as well. For the alleviation of poverty in Trinidad, CS/PS will play important and significant roles. The new CS/PS in the poverty area of Trinidad will be closely connected and linked with the integrated hospital service system of general and maternal/ child health through the establishment of effective health service model, including a referral system. This model and referral system will cover the rural areas in Mamoré, Moxos and other neighboring provinces including Yacuma province as well as Cercado province. The integrated hospital in Trinidad will be the top referral linked with hospitals and the upgarated CS/PS of four target provinces and the other hospitals such as Santa Ana in Yacuma.

### 3) Satellite zone 1

San Joaquin (or San Ramon) of Mamore province and San Ignacio of Moxos province are at the position to support the major service centers in North and Central zones. These CSs of the two municipalities will function as the satellite bases for the hospitals in the North and Central zones through the “Mancomunidad” system. The existing CSs of San Joaquin, San Ramon and Puerto Siles and in San Ignacio in these provinces should be strengthened as a satellite base of the integrated hospital of Trinidad for the inhabitants of these provinces. This kind of roles and function will be applied to other provinces without hospitals.

### 4) Satellite zone 2

Ethnic groups especially in Moxos are politically and economically in deprived conditions. The establishment and upgrading of the CS/PS, based upon a community and family health model, will be promoted for the improvement of their living standard as well as health conditions. Community participation for the establishment and management will be to develop the community health system in these ethnic areas. The community health system in this type of zone will be extended to the other areas in which ethnic groups live.

### 5) Riverside zone

The existing medical vessel systems operated by CARITAS/EPARU will be supported and strengthened by allocating ITEM and SUMI as well as facilities/equipment. This system will provide health services as mobile CSs/PSs. Target municipality of this mobile health service are Riberalta (Vaca Diez), Guayaramerín (Vaca Diez), Puerto Siles (Mamoré), San Joaquín

(Mamoré), San Jabier (Cercado), San Ignacio (Moxos), Santa Ana (Yacuma) and Exaltacion (Yacuma). Close cooperation with public authorities and these NGOs is indispensable for effective operation of medical boats and PHC activities to the poor people along the river.

### (3) Education and Training Plan

Technical assistance is required in realms of hospital management of administration, medical service, laboratory service, and operation/maintenance (O&M), and PHC activities.

Hospital management includes training on balance and budgetary management, human resources management and organizational management and is run under the cooperation with Hospital Universitario Japonés in Santa Cruz. Medical service is supported through technical transfer on the introduced medical equipment for effective treatment and management to doctors and nurses in the targeted hospital.

Laboratory service is strengthened in technical transfer on the introduced medical equipment for emergency and routine work, and educational training to laboratory technicians in CS/ PS laboratory for endemic diseases such as malaria, cooperating with CENETROP in Santa Cruz.

Operation/maintenance (O&M) component is for hospital engineers who are charged to operate and maintain equipment.

PHC activities are such as training of TBAs, community hygiene and nutrition for OTB/ community.

### (4) Selection of Priority Projects

Regional health system of Beni will be composed of the following four typical major Projects as parts of the Regional health system. These projects are the Priority Projects of the M/P. For each project, a model has been developed through the trial operation in the Pilot Study. Each model is composed of 13 components of the Sector Plan.

- a. Urban health model (hospital development)
  - Development of hospital management model for hospitals like the integrated hospital of Hospital Presidente German Busch and Hospital Materno Infantil, and upgrading of CSs in Trinidad.
  - Formulation of the development plan for the improved operation and maintenance for equipment supply of hospitals in Guayaramerin and Riberalta.
  - Formulation of the development plan for the improved operation and maintenance for equipment supply of CS-Hospital San Joaquin, San Ramon in Mamore province, and CS-Hospital San Ignacio in Moxos.
- b. Urban poverty area development model: The new establishment of PS in the urban poverty area, such as Nueva Trinidad in Trinidad City.
- c. Rural poverty area development model: Upgrading of the existing low grade CS/PS to a higher-level in the rural poverty area, such as Santisima Trinidad in Moxos through more distribution of human and financial resources to CSs/PSs in the poverty area in the 4 provinces. The existing CSs/PSs will be categorized into several types according to the criteria of health service quality shown in 4.3.1 in the Main Report. In addition to these criteria, a typical model of CS/PS will be developed for service quality based upon the location and accessibility for inhabitants to CS/PS as well as population covered by CS/PS.

- d. Integrated and comprehensive development model: strengthening the regional health network system among hospitals and CSs/PSs in Beni department through the improvement of mobile transport system on land and medical boat system through the river. There are several types of medical boat system. The following different types of medical boat system will be reviewed on their availability and cost/effectiveness through the study.
  - Mobile CS/PS type: The existing CARITAS boat has functioned as mobile CS in Beni. Their activities have contributed to the alleviation of poverty in the area where the boat represents the sole means of health service.
  - Mobile hospital type: In Ecuador, the integrated and comprehensive medical boat system have been introduced and operated in recent years through the assistance of UNICEF.
  - Mobile PHC and social service type: EPARU has operated the social service boat system with medical/health services by auxiliary nurses and technological support for agro-industrial production and products sales. This system functioned to alleviate poverty in an integrated manner.

## **4 Implementation Plan of M/P**

### **4.1 Development Strategies**

#### **(1) Preparatory stage (2002-2003)**

- 1) Coordination at the national level: At the national level, the Coordination Committee will be organized in order to manage regional health system in Beni and coordination with donors under the chairmanship of MSPS. One possible option is to place this Committee subordinate to the donor meeting at the MSPS. Allocation and management of medical boats, introduction of referral system between hospitals and CSs, and implementation of human/ financial resource allocation including cost sharing by organizations concerned will be decided by the Committee.
- 2) Coordination and Supervision at the Prefecture Level: The Steering Committee, established for Pilot Study monitoring, will continue its function as a coordination and supervisory committee for further Pilot Study implementation by the Bolivian side (Beni Prefectural Government).
- 3) Coordination and Supervision at the Municipal Level: The Technical Committee will be formed at the Municipal level under the Steering Committee as similar to the one this Development Study organized. The Technical Committee will be applied to Local Health Board (DILOS) which is organized in each Municipality. The Technical Committees will decide and approve a plan. Based on this implementation plan, required human/ financial allocation will be managed. It is necessary to set criteria for member selection of the Technical Committee and Project Office and to monitor member's activities.
- 4) Project Office: Project Office will also be established in the Prefectural Government in order to support the Steering and Technical Committees, follow up the Pilot Study and for the further implementation of the proposed projects in the M/P toward the target year 2010.
- 5) Model development: An applicable model of regional health system for Beni department will be developed based upon the result of the Pilot Study. A plan of a model development will reflected the results of the monitoring and evaluation of the Pilot Study. The Steering and Technical Committees will form implementation system based on the evaluation of activities and achievements of a model development.

- 6) Continuation and expansion of the Pilot Study: Continuation of the Pilot Study by the Bolivian side and application of the developed model to other areas of Beni.

(2) Short-term plan (2003-2006)

This is the stage for implementation of the proposed Master Plan, which reflects results of the Pilot Study and feasibility of the model. In this stage, although implementation system is primarily organized under the initiative of the Bolivian side; i.e., MSPS, Prefecture and Municipality, a support system among donors and NGOs is also formed on account of poor conditions of health service in Beni. Introduction of technical/ financial cooperation by donors is an effective measure. This period is the stage for implementation under cooperation among donors and NGOs. Target areas consist of the four provinces, which is investigated in the Master Plan. Particularly cooperation/ coordination among donors and effective use of resources/ experiences of each donor is required.

(3) Medium-term plan (2006-2008)

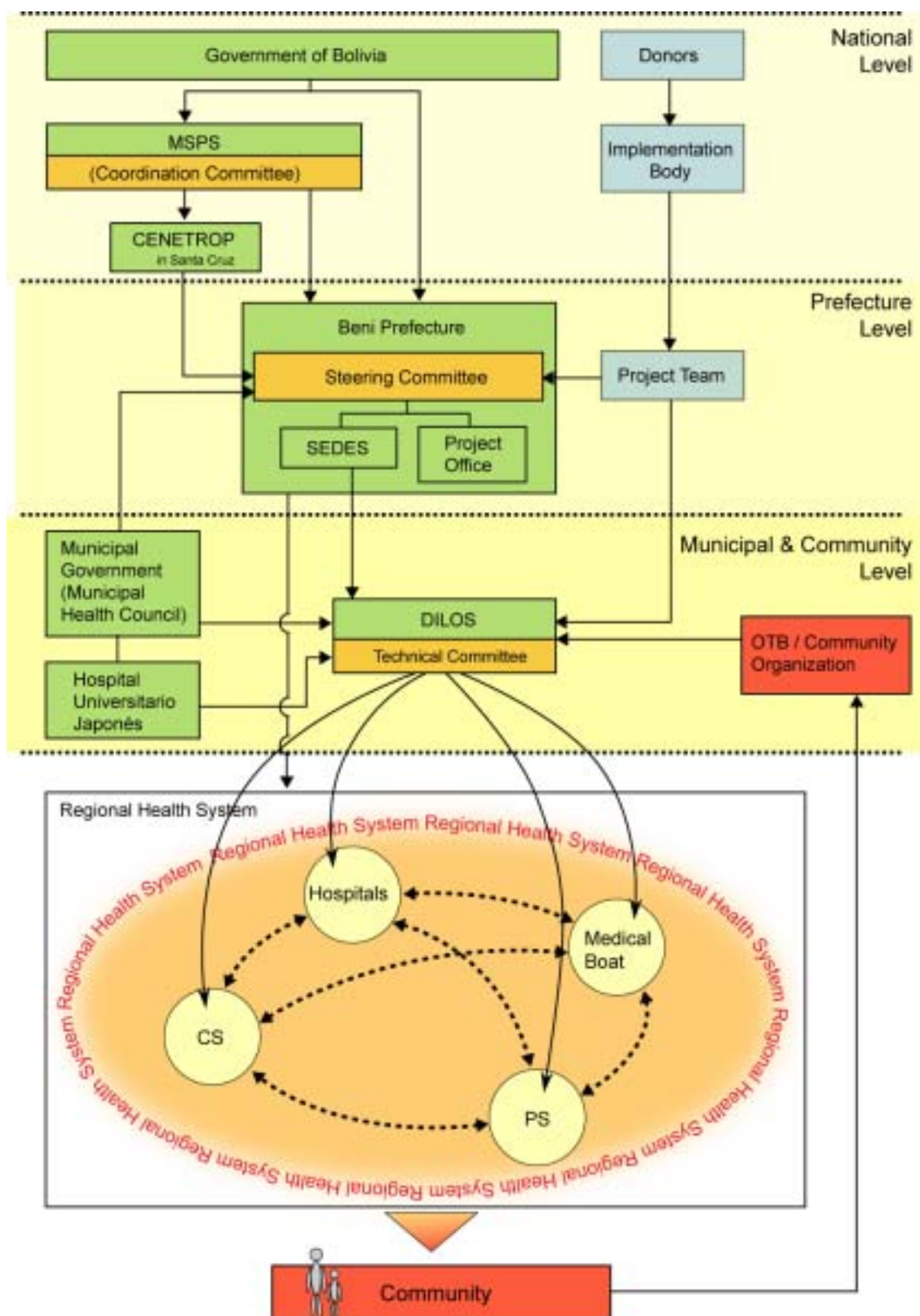
This is the stage for self-effort of the Bolivian side, utilizing human/ financial resources of Bolivia. Target areas are the same four provinces as in the short-term plan.

(4) Long-term plan (2008-2010)

This is the stage for applying the model to the whole Beni by the initiative of the Bolivian side.

## **4.2 Proposed Organization for Further Implementation**

For further implementation, the Prefecture government should establish a Project Office. This office will support the Steering and Technical Committees, continuing from the Pilot Study of the M/P. In addition, DILOS in each municipality should lead periodical meetings organized by the representatives of municipal government, SEDES, OTB as well as hospitals, CSs and the medical boat in each health service area (zone).



**Fig. S-1 Proposed Organization for the Implementation of Regional Health System in Beni Department**

## **5 Pilot Study**

In the M/P, four projects were selected as the model of regional health system in Beni department. These priority projects were carried out as the Pilot Study for one year, from January to December 2002.

### **5.1 Implementation Organization for Pilot Study**

#### **(1) Supervision and coordination**

For implementation of the Pilot Study, the Steering Committee (hereinafter referred to as SC) was established under the chairmanship of the Prefect of Beni. SC has been coordinating domestic organizations concerned at the prefecture level, municipalities, donors and NGOs, and carried out decision making.

Members of SC:

- a. Area coverage: 4 Provinces of Beni Department (Vaca Diez, Mamore, Cercado, Moxos)
- b. Member municipalities: 8 municipalities (Guayaramerin, Riberalta, San Joaquin, Trinidad, San Ignacio, San Ramon, Puerto Siles and San Javier)
- c. Members
  - Chairperson: Prefect of Beni Department
  - Vice chairperson: Director of Social Development Division of Beni Department
  - Members: Mayors, SEDES Directors, Medical School, donors (PROSIN), NGOs (CARITAS, EPARU), dean of the faculty of Nursing School of Trinidad, OTB of Nueva Trinidad, CEPIB for OTB of Santisima Trinidad (Moxos)

#### **(2) Technical supervision**

The Technical Committee (hereinafter referred to as TC) was established under the supervision of the SC with the chairmanship of Trinidad mayor. TC is the institution to examine technical issues among domestic organizations concerned at the municipal level and community organizations. The Committee acts as the coordination institution at the municipal level.

Members of TC:

- a. Chairperson: Mayor of Municipality
- b. Members: Municipal Council, Vigilance Committee, District SEDES, donors, NGOs, Medical Doctors Organization, Dean of Faculty of Nursing School of Trinidad, Hospital Director, FEJUVE, OTB and communities.

#### **(3) Implementation bodies**

- 1) Health service supply side survey
  - a. Two hospitals in Trinidad (Hospital Presidente German Busch and Hospital Materno Infantil)
  - b. CS Nueva Trinidad
  - c. CS Santisima Trinidad
  - d. Medical Boat (NGO-CARITAS)
- 2) Health demand side survey  
OTB and community

(4) Education/ Training

- 1) Hospital Management: Technology transfer of hospital management by the Hospital Universitario Japonés to the medical/ administrative staffs in the two hospitals in Trinidad.
- 2) PHC management: Technology transfer of PHC by CENETROP and SEDES to the medical staff and community representatives.

## **5.2 Monitoring Procedure of Pilot Study**

(1) 1st step

Own monitoring and evaluation by implementation bodies

(2) 2nd step

Monitoring and evaluation by the TC based upon the Monitoring Report prepared by the implementation bodies

(3) 3rd step

Monitoring and evaluation by the SC based on the Monitoring Report prepared by TC

(4) Fourth step

General review by the JICA Study Team for the preparation of Draft Final Report

## **5.3 Evaluation Criteria in Monitoring**

(1) Macroscopic viewpoint

Evaluation of the Pilot Study along the external factors (policies of central and municipal governments on poverty alleviation, human and financial resources allocation) was conducted.

(2) Microscopic viewpoint

Internal factors of the regional health system (demand and supply of health service) were evaluated, according to the following 13 indicators.

- 1) General health conditions
- 2) Extent of health service coverage
- 3) Institution and administration
- 4) Human resources
- 5) Cost sharing
- 6) Hospital management
- 7) Facilities and equipment
- 8) Medicines
- 9) Referral system
- 10) Community and family health
- 11) SNIS
- 12) PHC
- 13) Epidemiological approach

## 5.4 Preparation of Pilot Study

- (1) 14 December 2001: The 1st SC of the Pilot Study (M/M signed on 14 December 2001)
- (2) 8 February 2002: The 1st TC of the Pilot Study
- (3) 13-15 February 2002: The follow-up meeting of the 1st TC (After the meeting, cost sharing of financial/ human resources were agreed with organizations concerned.)
- (4) 15 February 2002: Signing of minutes of the 1st TC (Signing, approval and explanation of the implementation guideline for monitoring of the Pilot Study to the organizations concerned.)
- (5) April 2002: Starting of the 1st monitoring of the Pilot Study
- (6) August 2002: Evaluation of the 1st monitoring of the Pilot Study by TC and SC
- (7) 22 August 2002: Inauguration of the CS in Nueva Trinidad and Medical Boat
- (8) 24 August 2002: Inauguration of the CS in Santisima Trinidad
- (9) 1 September 2002: Starting of the 2nd monitoring of the Pilot Study
- (10) 9 December 2002: Evaluation of the 2nd monitoring of the Pilot Study by TC
- (11) 17 January 2003: General evaluation of the 1st and 2nd monitoring of the Pilot Study by TC
- (12) 23 January 2003: Explanation and discussion of Draft Final Report in SC
- (13) February 2003: Presentation of Final Report

## 6 First Monitoring (January-August 2002)

### 6.1 Evaluation from Macroscopic Viewpoint

Allocation of Human resources for Pilot Study was financed by regular ITEMS of MSPS, additional ITEM by HIPC II, EXTENSA and several municipal governments by the end of July 2002, based upon the agreement among agencies concerned at the TC in January 2002. The total number of allocated personnel for 2 CSs and Medical Boat was 25. The details of requested budget for the Medical Boat in 2002, determined by agencies concerned, are shown in Table S-3.

**Table S-3 Requested budget and cost sharing for medical boat among agencies concerned, 2002**

Unit: US\$

Cost	Requested budget by CARITAS	Cost sharing
<u>1. Salaries</u>		
1.1 Doctors and paramedics		
(1) General doctor	9,100	EXTENSA
(2) Dentist	9,100	EXTENSA
(3) Nurse	3,250	EXTENSA
(4) Auxiliary nurse	2,600	ITEM (SEDES)
(5) Social benefits (13.71%)	4,200	EXTENSA
1.2 Other staff		
(1) Malaria technician	2,600	EXTENSA
(2) Project coordinator	5,850	CARITAS
(3) Pilot	3,900	Municipality of Santa Ana
(4) Sailor	2,600	Municipality of Puerto Siles
(5) Cook	2,600	Municipality of Exaltacion
(6) Social benefits (13.71%)	1,896	3 municipalities mentioned above
Sub total	47,696	47,696
<u>2. Operational cost</u>		
(1) Fuel (Diesel oil, gasoline etc.for 5	7,254	1. PROSIN: 46% (10,043)



trips)		
(2) O & M	360	2. CARITAS: 19% (4,118)
(3) Meal (8 persons/trip x 5 trips)	11,430	3. Puetro Siles: 4% (800)
(4) Air ticket (3 trips/year)	480	4. Exaltacion: 5% (1,000)
(5) Transportation (3 trips)	240	5. San Joaquin: (2,100)
(6) Office and educational tool	600	6. Santa Ana/San Javier: (2820)
(7) Drugs and consumables	1,310	
Sub total	21,674	20,881
<u>3. Nonadjusted amount (minus)</u>		793
Total	69,370	69,370

Note (1) According to the agreement in TC meeting held in February 8th, 2002.

Note (2) Salary for nurse has not been paid by EXTENSA. Salary for malaria technician has been paid by EXTENSA and San Joaquin. Social benefits in salary have not been paid by EXTENSA, Municipality of Puerto Siles and Municipality of Exaltacion as of August 2002.

Medical staff started preliminary operation of CSs but their activities in each health facility were at various operational levels because of the different operational conditions prior to the Pilot Study, such as working experience, availability of facilities and equipment, and budget disbursement from the central and municipal governments.

(1) Hospital Presidente German Busch and Hospital Materno Infantil Dr. Jesus Vargas: Urban Health Model

Medical and administrative staff of the Hospital Universitario Japonés in Santa Cruz provided education and training to the selected staff of 2 hospitals in Trinidad on hospital management. Evaluation by the staff of the Trinidad hospitals and evaluation by Hospital Universitario Japonés indicated increased awareness of staff and impact of education and training on the hospital managements in this first monitoring.

(2) CS in Nueva Trinidad: Urban Poverty Area Development Model

Medical and administrative staff: 2 medical doctors (1 male, 1 female), dentist (male), nurse (female), 2 auxiliary nurses (female), laboratory technician and security guard were allocated to the temporary facility of CS. There was no staff of CS administration. All members were scheduled to transfer to the new CS after the completion of facility construction and equipment supply. These medical staff members provided health services to the community since April 2002 without medical equipment or medicines. However, there was no medicine supply through SBS before the opening of the new CS.

(3) CS in Santisima Trinidad: Rural Poverty Area Development Model

Medical and administrative staff: Medical doctor (male), dentist (female), 3 auxiliary nurses (2 male and 1 female) were allocated to the existing CS. There was no administration staff. All staff were scheduled to transfer to the new CS after the completion of facility construction and medical equipment supply. Some staff members had been working for seven years before the Pilot Study operation. The SBS had been effective when the Pilot Study began. Their activities increased intensiveness and extensiveness since new ITEMS were allocated. However, the salaries of some staff members assigned by ITEM were not paid on time because of the difference of employment contract and delay of the payment procedure compared to the regular ITEM by MSPS.

(4) Medical Boat: Integrated and Comprehensive Development Model

Medical doctor (female), dentist (male), 2 nurses / malaria technicians (male and female), auxiliary nurse (female), vaccination service operators, pilot, cook and sailor were allocated for the operation of the existing medical boat owned by CARITAS. CARITAS assumed the responsibility for the operation and management of the new medical boat prepared for the Pilot Study. These staff members were scheduled to transfer to the new boat after the completion of ship-building and medical equipment supply. There were administrative staff in CARITAS. Some agencies delayed the payment of their share of the budget, forcing CARITAS to compensate some amount of additional operation cost including salary and fuel consumption. CARITAS expected that this operation cost would be reimbursed by the responsible agencies based upon the agreement signed in February 2002. Due to this delay of budgeting and slow disbursement, the period of Medical Boat operation was shortened in comparison with the operation in 2001.

**Table S-4 Allocation of Human Resources for Pilot Study (2002)**

Type	Santisima Trinidad			Nueva Trinidad			Barco Medico			Total		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total
M.D.	1	0(1)	1(2)	0	2	2	0	1	1	1	3	4
N.	0	0(1)	0(1)	0	1	1	1	0	1	1	1	2
A.N.	1	2(1)	3(2)	0	2	2	1	1	2	2	5	7
D.	0	1	1	0	1	1	0	1	0	0	3	3
L.T./ B.C.	0	1	1	0	1	1	0	0	0	0	2	2
P.	0	0	0	0	0	0	0	1	1	0	1	1
G.	0	0	0	0	1	1	0	0	0	0	1	1
Other	0	1(0)	1(0)	0	0	0	0	4	4	0	5	5
Total	2	5	7	0	8	8	2	7	8	4	21	25

Remarks 1: A.assigned before Pilt Study, B. assigned additionally by Pilot Study

Remarks 2: M.D.(Medical doctor), N.(Nurse), A.N.(Auxiliary nurse), D. (Dentist), L.T.(Laboratory technician), B.C.(Bio-chemist), P.(Pilot), G.(Gurdman)

Remarks 3: Number in ( ) shows the originally requested numbers

## 6.2 Evaluation from Microscopic Viewpoint

### (1) Two hospitals in Trinidad: Urban Health Model

#### 1) Hospital Materno Infantil Dr. Jesus Vargas

Hospital Meterno Infantil Dr. Jesus Vargas had much improved its management system owing to the timely improvement on the supply and storage system of SBS medicine after the introduction of SBS system. The simplicity of management, i.e., concentrating resources on maternal and infant care contributed much to the success.

#### 2) Hospital Presidente German Busch:

The management problem of Hospital Presidente German Busch was much attributed to the poor coordination among individual medical and administrative sections, as it disperses rather than effectively consolidates the resources available. The need for a systematized management was critical. The hospital's large pool of indigent clientele accounted for the financial deficit, along with insufficient support of the SBS.

**Table S-5 Financial Statement of Hospitals, January - June 2002**

HOSPITAL MATERNO INFANTIL													Unit: Bs.	
REVENUE	January	%	February	%	March	%	April	%	May	%	June	%	TOTAL	%
Hospital service	33,547.00	44.8	27,179.00	80.7	26,753.00	84.7	29,790.00	40.9	26,724.00	34.0	25,282.00	22.1	169,275.00	41.7
Teaching														
Pharmacy	11,342.80	15.2	6,493.60	19.3	4,819.50	15.3	8,441.20	11.6	8,532.50	10.8	6,493.00	5.7	46,122.60	11.4
Other incomes (No tribute)														
Account receivable from bank														
Transfer from T.G.N.	-		-		-		-		-		-		-	
Transfer from H.A.M.	29,945.00	40.0					34,639.50	47.5	43,444.50	55.2	82,684.00	72.2	190,713.00	47.0
TOTAL	74,834.80	100.0	33,672.60	100.0	31,572.50	100.0	72,870.70	100.0	78,701.00	100.0	114,459.00	100.0	406,110.60	100.0

EXPENDITURE	January	%	February	%	March	%	April	%	May	%	June	%	TOTAL	%
Personnel cost	5,892.50	12.1	16,561.00	21.7	10,866.00	14.9	13,704.00	22.6	9,592.00	10.0	16,374.00	15.8	72,989.50	15.9
Non personnel cost	939.00	1.9	489.20	0.6	612.00	0.8	1,601.65	2.6	2,810.40	2.9	5,089.30	4.9	11,541.55	2.5
Materials and consumables	21,675.70	44.5	53,113.50	69.5	59,203.38	81.0	45,266.92	74.7	83,601.38	87.1	79,977.66	77.4	342,838.54	74.8
Real asset					260.00	0.4					1,917.30	1.9	2,177.30	0.5
Financial asset														
Loan and other asset	20,157.76	41.4	6,252.50	8.2	2,120.00	2.9							28,530.26	6.2
TOTAL	48,664.96	100.0	76,416.20	100.0	73,061.38	100.0	60,572.57	100.0	96,003.78	100.0	103,358.26	100.0	458,077.15	100.0

HOSPITAL GERMAN BUSCH													Unit: Bs.	
REVENUE	January	%	February	%	March	%	April	%	May	%	June	%	TOTAL	%
Hospital service	31,931.50	78.6	31,193.60	78.2	37,661.00	80.7	34,463.50	83.8	33,070.00	86.0	30,375.00	84.3	198,694.60	81.8
Teaching														
Pharmacy	8,689.40	21.4	8,694.90	21.8	9,029.30	19.3	6,675.40	16.2	5,404.40	14.0	5,655.50	15.7	44,148.90	18.2
Other incomes (No tribute)														
Account receivable from bank														
Transfer from T.G.N.	-		-		-		-		-		-		-	
Transfer from H.A.M.	-		-		-		-		-		-		-	
TOTAL	40,620.90	100.0	39,888.50	100.0	46,690.30	100.0	41,138.90	100.0	38,474.40	100.0	36,030.50	100.0	242,843.50	100.0

EXPENDITURE	January	%	February	%	March	%	April	%	May	%	June	%	TOTAL	%
Personnel cost	5,370.00	15.3	8,200.00	24.1	5,180.00	11.9	5,380.00	14.5	5,132.00	12.4	10,640.00	31.7	39,902.00	17.7
Non personnel cost	1,136.00	3.2	335.00	1.0	881.00	2.0	728.50	2.0	940.00	2.3	723.00	2.2	4,743.50	2.1
Materials and consumables	28,675.17	81.5	25,161.94	73.9	37,644.41	86.1	30,911.09	83.5	35,328.01	85.3	22,159.77	66.1	179,880.39	80.0
Real asset			370.00	1.1									370.00	0.2
Financial asset														
Loan and other asset														
TOTAL	35,181.17	100.0	34,066.94	100.0	43,705.41	100.0	37,019.59	100.0	41,400.01	100.0	33,522.77	100.0	224,895.89	100.0

Remarks	1: JICA Study Team calculated revenue and expenditure, based upon the provided raw data from these hospitals in August 2002. Difference of total revenue and total expenditure is not yet identified.													
	2: H.A.M stands for Honorable Arcadia Municipal (Honorable Mayor's Office)													
	3: Personnel cost does not include ITEM allocation for medical staff, equivalent of Bs. 240,000/ month (average, 2002).													

### 3) Common aspects in two hospitals

The lack of POA and lack of effective use of the limited human and financial resources in were evident. The Hospital Management Committee was established in June 2001 in both hospitals, according to the Decentralization Law. Hospital directors understood the importance of Committee meetings for better hospital management. However, this Committee had not been operated because of the lack of coordination and responsibility of the agencies concerned. The SBS fund was smoothly allocated to the hospital, because the Municipal Government had an interest in the hospital management as owner of the hospitals. However, the municipal government had little interest in the education and training for the hospital staff. The municipal government considered that such kind of activities should be conducted under SEDES's responsibility. The hospital has an important role in the regional health system, but no effective liaison with CSs was observed. Almost all medical equipment was over their project life and/or in less use because of poor O&M system. There were a limited number of technicians only for simple repair and maintenance in each hospital. This problem was to be addressed through a contract to outsource the equipment maintenance work to the engineers of private sector by monthly or bi-weekly basis.

### (2) CS Nueva Trinidad: Urban Poverty Area Development Model

In the CS of Nueva Trinidad, all staff members were newly assigned to the Pilot Study. Majority of staff was not familiar with community health and the CS had no medical equipment. There was no PHC guidelines except their own materials. The ultimate decision maker of the CS was not identified by the municipal government, and it was still under

consideration. There was no instruction as to who will head the CS; currently one doctor reports to SEDES and the other the JICA Study Team.

Health service activities were expanded with augmented quality by the ITEM allocation compared with the voluntary service in the past. Medical staff who were assigned by HIPC II were paid every 3 months according to the contract with the municipal government. This tri-monthly reporting duty consumes much time and funds that could serve patients. There was no coordination among CS, municipal government and *Health District* on the CS management and operation. PHC service coverage area and items were overwhelming for the medical staff, and there was no education and training materials for this purpose.

(3) CS Santisima Trinidad: Rural Poverty Area Development Model

CS of Santisima Trinidad was well managed due partly to the past experiences of the medical staff, and their activities were encouraged and qualified by the allocation of the additional ITEM, especially by the assignment of female medical staff for an auxiliary nurse and a dentist. POA for the annual program was prepared for PHC promotion.

OTB was planning to establish a small scale medicine storage system at the community level in cooperation with the CS by introducing micro-credit system. This system will operate under the auspices of the medical doctor of CS, who has a responsibility in identifying the types of medicine to supply for each case. Auxiliary nurses make house-to-house visits to find out ADI and respiratory disease cases and report medical doctors on each case.

(4) Medical Boat in Mamore River: Integrated and Comprehensive Development Model

The medical boat had been operated by CARITAS in the past. Almost all medical staff stayed on the responsibility after the introduction of the Pilot Study. Their activity was expanded but with a slow progress due to delayed disbursement of staff salary and operation cost from relevant agencies. Operation cost of the medical boat was shared among the municipal governments, PROSIN and CARITAS, though two municipal governments failed to pay their due.

CARITAS staff did not participate in the education and training program by SEDES since no financial support for the purpose was given. SEDES placed little emphasis on CARITAS' health promotion activities except the National Program like malaria prevention campaign. CARITAS members had no chance to participate in the meeting under IAC (CAI) program. The evaluation of CARITAS' activities by SEDES was low, as it was based on quantity rather than quality.

## **7 Second Monitoring (September-December 2002)**

### **(1) Hospital Materno Infantil Dr. Jesus Vargas and Hospital Presidente German Busch: Urban Health Model**

#### **1) Hospital Materno Infantil Dr. Jesus Vargas**

After the training, increased motivation was observed among all persons involved. The hospital offers integral services to women and children. Motivation was generated in the director, chiefs of service and administration who initiated the reorganization of the hospital. Technical administrative committee was organized for the hospital management. The committee meeting was held every first Tuesday of the month and adhoc-committee meeting was organized when necessary. One of the main interests of the Committee was the SBS. The hospital was restructured by the Counseling Committee. Administration sub-system, the computer network system in the direction, secretary, administration, accounting and statistics, was realized by the donation of the Canadian Society. The Support committee (clinical histories, hospital infections etc.) was restructured under Technical Administrative Committee. Annual Operative Plan (POA) for the year of 2003 has integrated all hospital services and included statistics, administration and social work. Although the hospital began registration of patients, it could not carry out a cost analysis. The O&M of medical equipment was still at an elementary level. Medicines were supplied by various local distributors. The Medicine Acquisition Committee examined the institutional purchase of medicines with the use of a revolving fund. This system was yet to take effect for the lack of efficiency of *District Health I* and SEDES.

#### **2) Hospital Presidente German Busch**

The hospital was expected to function as the 2nd and 3rd referral during the education/training by Hospital Universitario Japonés in Santa Cruz. However there was still no clear definition of the role of the hospital. Support from superior authorities was not observed. Frequent changes of staff and disturbance of the government disturbed the scheduled development of the hospital. The politics between the union and a political party hinders effective deployment of human resources. The staff in directive position did not have appropriate qualifications. There was no support from the Director of the Hospital for managerial decisions. Regular meeting was held by Technical Administrative Council. Due to the lack of leadership of core personnel such as manager, system for hospital management was not established. Many medical staff were working part: 3 hours per day from Monday to Friday. Because the hospital did not have a qualified technician for O&M of medical equipment, the Hospital Universitario Japonés trained a personnel in this regard. But the performance of this trainee was still at a primary level. Medicines were not managed by qualified staff, and they only checked the storage of medicines in the process of accounting. Referral system was not functioning well. SNIS was functioning.

### **(2) CS Nueva Trinidad: Urban Poverty Area Development Model**

The CS is located in the health area VI (Cipriano Barace) of the Health District I and it has a population of 2,086. The systematic health services of national program offered by the new CS had been enhanced, and various health services have become available. Accessibility to the CS (transportation time) was adequate. Municipality of San Ignacio paid the electricity and water charges, and the CS had not been affected by political influence. Because the role of the CS was not defined, support from Health District 1 was still weak. Salary payment by HIPC II was delayed. The relationship between the health staff and the community was

adequate. The paid consultations increased. Generally, the medical staff of the CS were using this CS building very well considering the limited space prepared by the Study Team for the CS functions. But it was reported that the building had problems on the wastewater treatment system and the water distribution piping system. Local contractor conducted fixing works to both problems, but in case of the waste water treatment, new equipment installed by the contractor did not function well. Therefore, municipal government carried out temporary counter measure. The provisioning of the medicines was carried out mainly in the CEASS through a revolving fund. The pharmacy provided essential drugs to the inhabitants at cheaper-than-market prices, therefore the population seemed to be satisfied. The medicines were stored on a shelf in the pharmacy, and the nurses used a registration method for each medicine. They were checked monthly and the expiration date was controlled. Of all the 34 referral cases, 21 cases were covered by the SBS and were referred to the Hospital Materno Infantil. The other 13 cases were referred to the other Hospital. It was remarkable that in the first monitoring the CS didn't have any counter-referral but in the second monitoring the CS had 3 counter-referral cases from the Hospital Materno Infantil and another from another CS. The majority of the CS patients were younger than 5 years old or between 15 to 45 years of age. The dental consultation was on the increase, and it became the biggest financial source of the CS. The health personnel were working very hard for the pregnancy care. The auxiliary nurses carried out the family planning orientation in the community. The CS participated in two vaccination campaigns of the EPI. The vaccination coverage was expanded by the cold chain equipment installed in the CS. The house-to-house visits were an effective way to detect pregnant women, diseases of children under 5 years, patients with higher risk, as well as a good opportunity to educate inhabitants and prevent illnesses. The health committee and the OTB collected money, bought medicines and visited different institutions like CARITAS, to secure their cooperation. With respect to the filling of the SNIS forms, the health personnel improved the recording procedure in comparison with the first four months of work, but the medical staff implied that it took much time to fill up the SNIS forms and this kind of work reduced the quality and the time to provide health service to patients. The CS worked with the VALA (Program of Alert Surveillance and Action) for epidemiological activity. The CS informed SEDES about suspected cases, then SEDES sent the respective sample to CENETROP for diagnosis. There is a set of recorded data on morbidity and mortality in the CS.

According to the cost analysis in the own evaluation report by this CS, total annual operation cost of this CS was estimated to be US\$ 21,600 (Bs. 162,000)/year (US\$ 20,800 (Bs. 156,000) for salary, and US\$ 800 (Bs. 6,000) for the other operation cost). Annual cost per beneficiary was US\$ 6.24 (Bs. 46.8)/year (US\$ 6.00 (Bs. 45.0) for salary, and US\$ 0.24 (Bs. 1.8) for the other operation cost).

### (3) CS Santisma Trinidad: Rural Poverty Area Development Model

The Health committee and Mother's Club were active in pursuing their roles. The CS expanded the coverage to the other communities (Isiboro, Secure, Ichoa, Imose, Moletto etc.) of TIPNIS and the CS provided the health information to rural communities by means of radio telecommunication system twice a week for the purpose of reducing the morbidity and mortality in children and mothers. The Health committee participated in various community meetings and fostered an excellent relationship between the health personnel in each community, health counsels and municipality. Both buildings of the CS and the dormitory were functioning well, but the dormitory building had problems on the water delivery system. Therefore, it was scheduled that local contractor would follow up the problem after the high water level in the neighboring rivers would calm down to the normal level. Regarding the

medical equipment, as a refrigerator and a dental chair had some problems, local equipment supplier carried out the maintenance work and fixed them. Free medicines were supplied to children and mothers covered by the SBS. However, there was still difficulty in assisting those older than 5 years and adults. The CS was successful in reducing diseases like ARI, ADI infections, intestinal worms, etc. between the first monitoring and the second through house-to-house visits. Though the medical staff filled out the SNIS forms, the information flow was one-way to the *Health District* and SEDES and there was no feedback to the CS.

#### (4) Medical Boat: Integrated and Comprehensive Development Model

The medical boat has serves 28 communities of 5 municipalities (3,159 inhabitants). The radio communication system was used to coordinate the activities within the community and with other communities. The Health Council and the Health Municipal Committee were not active. The health staff of the medical boat had not been affected by political influence. There were some payment problems as the cost items were individually contracted. EXTENSA did not complete the payment due to the complexity that hampered the reimbursement. Regarding the medical equipment condition, a refrigerator and others has some problems, therefore local equipment supplier was checking the conditions. The municipalities paid the medicines of the SBS for mothers and children. The Medical Boat had a pharmacy that works with a revolving fund. PHC activities by CARITAS were effective. When the medical boat was absent, health promoters looked out for the health of the community people, and medical staff of the medical boat gave guidance to the health promoters using the radio communication system.

Regarding the total annual operation cost of the medical boat, it was estimated to be US\$ 70,000 for 5 trips (US\$ 48,000 for salary, and US\$ 22,000 for the other operation cost). Annual cost per beneficiary was US\$ 17 (US\$ 11 for salary, and US\$ 6 for the other operation cost).

## 8 PROPOSED TECHNICAL COOPERATION

According to the M/P, the regional health system will be developed by following 4 major zones, namely, i) north zone, ii) central zone, iii) satellite zone and iv) riverside zone. The priority programs for the Pilot Study, the core of the programs formulated in the M/P, were planed to be carried out in the zones of ii), iii) and iv) mentioned above. The programs proposed for the technical cooperation at the present time has a role in support and expansion of the priority programs.

### 8.1 Program Component

Program serves three (3) areas of as north, central and south with regard to the efficiency of accessibility, enforcement of referral system network and equity of PHC (vaccination program and maternal health care, etc.). A small referral system network, from primary health care to tertiary health care (second level in general), is completed in each area. Based on the experience the pilot study, expansion of each model of the Pilot Study will be developed considering social, economic and financial feasibility.

#### (1) Program in Northern Area

Riberalta is the hub in the northern area, covering Vaca Diez District. Riberalta hospital becomes the highest health service facility in this area, and surrounded CS and PS can refer patients to the Riberalta hospital. In addition, the medical boat will serve riverside communities along Beni River.

Riberalta has nurse education programs; a 16-month course for auxiliary nurses and a 5-year course for licensed nurses. In this northern area, malaria is one of the most important endemic tropical diseases. MOH intends to establish the institute of tropical medicine (CAMETROP) in Riberalta with major donors.

**Table S-6 Target Organization and Facilities on the Program in North Area**

Input	Primary Health Care	Secondary Health Care	Tertiary Health Care
Target organization	OTB/ Community	Hospitals	Hospital workers
Target facilities	Puesto de Salud (PS) Medial Boat CS		Riberalta Hospital

To fulfill the concept, following activities are proposed;

- Training of hospital management for institutional and equipment maintenance
- Technical transfer to health facilities (laboratory and medical workers) with cooperation with CAMETROP
- Education in the auxiliary nursing school and Health science faculty of nursing course in Technical University of Beni in Riberalta
- Medical equipment supply to Riberalta hospital as top referral hospital (secondary level) in northern area
- Shipbuilding of medical boat and its equipment procurement
- Medical equipment supply to CS/ PS collaborating with FPS

These activities work together to build the referral system network within the northern area.

## (2) Program in Central Area

Trinidad is the hub in the central area and Hospital Presidente German Busch and Hospital Materno Infantil Dr. Jesus Vargas become the highest health service facility in Cercado, Mamoré, Moxos and Yacuma Districts. Medical boat procured for the Pilot Study operates along Mamoré River to cover riverside communities and CS/ PS covers remote area.

For medical education, Trinidad has nurse education programs of 18-month course for auxiliary nurses and 5-year course of licensed nurses. In Santa Cruz, CENETROP is established for tropical medicine of Bolivia and this center has a long-term experience with Japanese experts for laboratory work and targeted south part of Beni Department. Additionally, Hospital Universitario Japonés assists in capacity building for Hospital Presidente German Busch and Hospital Materno Infantil Dr. Jesus Vargas in the Pilot Study.

**Table S-7 Target Organization and Facilities on the Program in Central Area**

Input	Primary Health Care	Secondary Health Care	Tertiary Health Care
Target organization	OTB/ Community	Hospitals	Hospital workers
Target facilities	Puesto de Salud (PS) CS		Hospital P.German Busch Hospital Materno Infantil

To materialize the concept, following activities are proposed;

- Training on hospital management for institutional and equipment maintenance in cooperation with Hospital Universitario Japonés in Santa Cruz
- Technical transfer to health facilities (laboratory and medical workers) in cooperation with CENETROP
- Medical equipment supply to Hospital Presidente German Busch and Hospital



Materno Infantil Dr. Jesus Vargas for being top referral hospital (secondary level) in central area

- Education in the auxiliary nursing school and Health science faculty of nursing course in Technical University of Beni in Trinidad
- Medical equipment supply to CSs/ PSs with assistance from FIS/ FPS

### (3) Program in Southern Area

San Ignacio de Moxos is the hub in Moxos and Marbán Province as southern area. Medical Boat connects communities through Isiboro River, included Santísima Trinidad where is the site of the Pilot Study. City of Cochabamba or Santa Cruz is nearer than Trinidad to refer severe patients, so that the top referral hospital does not exist in southern area. To corroborate this situation, some CS needs to be strengthened and to have the hub function for other CSs/ PSs and medical boat.

**Table S-8 Target Organization and Facilities on the Program in Southern Area**

Input	Primary Health Care	Secondary Health Care	Tertiary Health Care
Target organization	OTB/ Community	Hospitals	-
Target facilities	Puesto de Salud (PS) Medial Boat CS		-

To fulfill the concept, following activities are raised;

- Training of hospital management for institutional and equipment maintenance with cooperation with Hospital Universitario Japonés in Santa Cruz
- Technical transfer to health facilities (laboratory and medical workers) with cooperation with CENETROP
- Shipbuilding of medical boat and its equipment procurement
- Medical equipment supply (including speed boat) to CS/ PS corroborating with FPS

## 8.2 Required Technical Assistance

Technical assistance is required in the realms of hospital management of administration, medical service, laboratory service, and operation/maintenance (O&M), and PHC activities.

Hospital management includes training on balance and budgetary management, human resources management and organizational management and is run under the cooperation with Hospital Universitario Japonés in Santa Cruz. Medical service is supported through technical transfer on the introduced medical equipment for effective treatment and management to doctors and nurses in the targeted hospital.

Laboratory service is strengthened in technical transfer on the introduced medical equipment for emergency and routine work, and educational training to laboratory technicians in CS/ PS laboratory for endemic diseases such as malaria, cooperating with CENETROP and CAMETROP.

Operation/maintenance (O&M) component is for hospital engineers who are charged to operate and maintain equipment.

PHC activities are such as training of TBAs, community hygiene and nutrition for OTB/ community.

### 8.3 Project Cost

Total project cost is approximately US\$5,463,000

- Northern area: total cost US\$1,810,000
- Central area: total cost US\$2,321,000
- Southern area: total cost US\$1,332,000

### 8.4 Implementation Schedule

The project is divided into three (3) phases for each area, three (3) years in total. First phase in the first year is the implementation in the central area to continue and expand the activity of the Pilot Study.

Second phase in the second year shifts its focus to the northern area and the project base moves to Riberalta. CAMETROP is established in Riberalta and its training capacity is developed.

Third phase in the final year for the southern area is based in Santa Cruz or San Ignacio.

**Table S-9 Assignment Schedule of Dispatched Person**

	1st phase												2nd phase												3rd phase											
Dispatched Person	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Project Manager																																				
Hospital Management	■						■			■			■						■			■			■						■			■		
O/M Management			■				■				■				■				■				■				■				■				■	
Disease Control/ Surveillance																																				
PHC																																				
Coordinator																																				

### 8.5 Implementation Agency

Expected implementation agencies for this technical cooperation are shown below.

Implementation Agency: Beni Prefecture

Ministry: Ministry of Health and Social Welfare, Vice Ministry of Public Investment and External Finance, Ministry of Finance

### 8.6 Related Activities by Third Countries or International Organizations in the Same Sector

USAID/PROSIN, UNICEF, CIDA, WHO/PAHO and UNFPA.

### 8.7 Benefit and Effects of the Project

#### (1) Beneficiaries

- 1) Cercado Province
  - Trinidad: population 78,940
  - San Javier: population 4,074
- 2) Mamoré Province
  - San Joaquin: population 5,489

- Puesto Siles: population 1,035
- 3) Moxos Province
  - San Ignacio: population 22,038

(2) Benefit and Effect

Sustainable regional health system will be developed for poverty alleviation with the following benefits and effects

- a. Strengthening of institution and management body
- b. Effective health service through regional health system
- c. Effective use of the limited human and financial resources
- d. Promotion of inter-municipal organization (mancomunidad) system
- e. Sustainable education and training system

## 8.8 Method of Technical Cooperation

(1) Project Type

- 1) Development Survey, Phase II: "The Study of Enhancement of District Health System for Beni Prefecture in the Republic of Bolivia" will be completed by the end of March 2003. This Study is at the stage of M/P development and initial operation of the proposed priority projects as the Pilot Study for the model development of the Regional Health System in Beni Department. This stage will be identified as the Stage I of the Development Survey.

The developed model will be transferred and expanded to the four provinces and the other related areas of Beni Department. For this purpose, the development survey as Stage II will be proposed. Major purpose of this Stage II survey is to establish the effective institution and organization of Regional Health System including sustainable "mancomunidad" system and transfer the technology developed in the Development Survey Stage I to the relevant organizations.

Appropriate consultants will be assigned for this development survey domestically or from neighboring countries as well as donor countries.

- 2) Technical Cooperation Project

Purpose of the Project is the same as 2) Development Survey but with more focus on the project implementation rather than investigation. A consulting firm will work jointly with NGOs and/or Universities for Technical Cooperation.

## (2) Qualification of dispatched persons

### 1) Roles of project staff

Position	Project Manager	Hospital Management	O/M Management	Disease Control/ Surveillance	PHC	Coordinator
Project manager						
Donor coordination						
Institution/ Organization						
Human resources						
Financial resources						
Administration						
O&M of facility and equipment						
Drug management						
Referral system						
Community health system						
SNIS						
PHC						
Infectious disease control						

### 2) Required qualification for project staff

	P. Manager	Hospital management	O/M of facility and medical equipment	Infectious disease control	PHC	Coordinator
International consultants	Experience of PM in relevant area.	Sufficient experience of the position in South America.	Experience of the position.	Experience of the position in Bolivia or South America.	Experience of the position in Bolivia or South America.	Experience of the position in relevant area.
Local consultants						

## 9 Conclusion and Recommendation

### 9.1 Conclusion

Beni Department is located in the Amazon basin which is affected by drastic changes of natural conditions between dry and rainy seasons and inaccessibility due to low population density. Also, inhabitants suffer difficulties in accessing hospitals and other health facilities. There are various types of tropical diseases with high mortality rate, especially for pregnant women and children below 5 years old.

- (1) Various types of projects have been implemented in this area. However, there is little coordination among projects. Therefore, effectiveness of each project is limited and not expanded to a wider area.

- (2) There is no integrated Regional Health System under consensus among agencies concerned. Consequently, human and financial resources are not utilized effectively, and benefit to the poor is not optimal.
- (3) Major issues of Regional Health System in Beni are i) improvement of institution and administration, ii) Effective allocation of human and financial resources, iii) upgrading of health service quality, iv) Promotion of participatory approach for PHC
- (4) Two Committee have been established to coordinate relevant agencies and supervise the Pilot Study. Based on the consensus reached in these Committees, the Bolivian government has committed human and financial resources through the MSPS and municipal governments, while JICA provided health infrastructure and medical equipment. The agents of this Pilot Study were the newly assigned medical personnel, who were trained through the Technical Transfer scheme by technically privileged institutions in Bolivia (i.e., Hospital Universitario Japonés and CENETROP in Santa Cruz). Monitoring was conducted twice, which demonstrated multiplying benefit of the infrastructural, financial and human resources invested. This Pilot Study made a significant contribution in building a health development model for the impoverished area of Beni Department. The communication and coordination was initiated among the institutions/ organizations concerned (government, SEDES, prefecture/ municipalities, OTBs, hospitals, CS/PS and NGO) soon after the Pilot Study commenced, and the communication/ coordination contributed to the successful implementation of the Pilot Study.

## **9.2 Recommendation**

### **(1) M/P**

The integrated regional health system will be developed for the health improvement of pregnant women and children below 5years old in the poverty areas. For this purpose, this system will be programed by developing various types of area models to meet the regional characteristics of provinces and municipalities. It was confirmed by the Pilot Study that these area models were feasible and effective.

1. Urban health model (hospital and CS-hospital development)
2. Urban poverty area development model
3. Rural poverty area development model
4. Integrated and comprehensive development model (medical boat system)

### **(2) Stage-wise implementation of M/P**

A Regional Health System will be proposed based upon the national policy, such as decentralization and popular participation. The establishment of the proposed system requires capacity building of the human resources and institutions at the prefecture and municipal level, and is expected to take a considerable period of time. To accelerate the process, sustainable and stage-wise education and training programs are recommended.

### **(3) Implementation organization in Bolivia**

Based upon the stage-wise implementation plan, sustainable support system of the proposed programs/projects should be organized for the human resources allocation and budget

preparation at the prefecture and municipal levels as well as at the national level. The proposed organizations are i) Coordination Committee at the national level, ii) Steering Committee at the prefecture level and iii) Technical Committee under DILOS at the municipality level.

(4) Sustainable development of Pilot Study by the Bolivian side

Sustainable development of the Pilot Study on the four priority programs proposed by the M/P is a basis for further implementation of stage-wise plan of the M/P. The counterpart agency of Beni Prefecture will be responsible for managing and operating the new facilities and equipment which will be donated by JICA to the Bolivian side and apply the transferred technology to the Bolivian administrative and medical staff. The Bolivian side should take necessary measures on the following points for donation of the facilities and equipment from JICA.

1. ITEM allocation by MSPS and HIPC II.
2. Budget preparation by donors (EXTENSA, PROSIN, etc.), municipalities and NGOs for salaries of the other staff which are not covered by 1.
3. Operation cost for medical boat contributed by municipal governments and necessarily assisted by donors and NGOs.

Donors should monitor and follow up the activities and effectiveness by the Bolivian side's operation and management of the Pilot Study.

(5) Implementation of Technical Cooperation

Technical cooperation will be expected from donors for the purpose of education and training of medical and administrative staff of the Regional Health System. Major purposes of the cooperation are; i) Education and training for strengthening of hospital management and PHC operation, ii) Technology transfer for O & M of the medical facilities and equipment, iii) Education and training of nurses and auxiliary nurses, etc. It is required to use experiences and know-how developed in the Hospital Universitario Japonés, CENETROP in Santa Cruz and SEDES in Beni. Types of Technical Cooperation are Development Survey Stage II or Technical Cooperation Project.

## MAIN REPORT

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## APPENDICES

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- List of Collected Data
- Minutes of Meeting
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## ABBREVIATIONS

English		Spanish	
ADD	Acute Diarrheal Diseases	EDA	Enfermedad Diarreica Aguda
AIDS	Acquired Immunodeficiency Syndrome	SIDA	Síndrome de Inmuno Deficiencia Adquirida
ARI	Acute Respiratory Infection	IRA	Infección Respiratoria Aguda
BCG	Bacillus Calmette-Guerin (Vaccination)	BCG	Vaccuna BCG (Bacillus Calmette-Guerin)
C/P	Counterpart	C/P	Contraparte
CAPO	Attached Certificate of Services Offered	CAPO	Certificado Agregado de Prestaciones Otorgadas
CARITAS	Catholic Agency for Overseas Aid and Development	CARITAS	Agencia Catolica para la Ayuda y el Desarrollo
CDC	Center for Disease Control and Prevention (U.S.A.)	CDC	Centro para el Control y Prevención de las Enfermedades (EE.UU.)
CDD	Control of Diarrheal Diseases	CDD	Control de las Enfermedades diarreicas
CEASS	Center for Medical Supplies	CEASS	Centro de Abastecimientos y Suministros en Salud
CENETROP	National Center for Tropical Diseases	CENETROP	Centro Nacional de Enfermdades Tropicales
CIDA	Canadian International Development Agency	CIDA	Agencia Internacional Canadiense para el Desarrollo
CIES	Center for Research, Education and Services	CIES	Centro de Investigación, Edcuación y Servicios
CIPS	Center for Health Inputs	CIPS	Centro de Insumos para la Salud
CNS	National Health Insurance	CNS	Caja Nacional de Salud
CPR	Contraceptive Prevalence Rate	TPA	Tasa de Prevalencia Anticonceptiva
CRS	Catholic Relief Services (NGO)	CRS	Catholic Relief Services (ONG)
CS	Health Center	CS	Centro de Salud
DF/R	Draft Final Report	DF/R	Borrador del Informe Final
DHS	Demographic and Health Survey	ENDSA	Encuesta Nacional de Demografía y Salud
DILOS	Local Health Board	DILOS	Directorio Local de Salud
DPT	Diphtheria, Whooping cough and Tetanus	DPT	Vacuna DPT (Difteria, Tosferina y Tétanos)
DUF	Directorate of Funds	DUF	Directorio Unico de los Fondos
EPARU	Rural Pastoral Team	EPARU	Equipo de Pastoral Rural
EPI	Expanded Programme on Immunization	PAI	Programa Ampliado de Immunizaciones
F/R	Final Report	F/R	Informe Final
FIS	Social Investment Fund	FIS	Fondo de Inversion Social
FPS	National Productive and Social Investment Fund	FPS	Fondo Nacional de Inversion Productiva y Social
GDP	Gross Domestic Product	PIB	Product Interno Bruto
HAM	Honorable Municipal Government	HAM	Honorable Alcaldia Municipal
HIPC	Heavily Indebted Poor Country	PPME	País Pobre Muy Endeudado

English		Spanish	
HIV	Human Immunodeficiency Virus	VIH	Virus de Inmunodeficiencia Humana
IC/R	Inception Report	IC/R	Informe Inicial
ICU	Intensive Care Unit	CUI	Unidad de Cuidados Intensivos
IDB	Inter-American Development Bank	BID	Banco Interamericano de Desarrollo
IDD	Iodine Deficiency Disorders	DDY	Desordenes por deficiencia de yodo
IMCI	Integrated Management of Childhood Illness	AIEPI	Atención Integral de las Enfermedades Prevalentes de la Infancia
IMR	Infant Mortality Rate	TMI	Tasa de Mortalidad Infantil
INE	National Institute of Statistics	INE	Instituto Nacional de Estadística
IT/R	Interim Report	IT/R	Informe Intermedio
IUD	Intrauterine Contraceptive Device	DIU	Dispositivo Intrauterino
JICA	Japan Intrenational Cooperation Agency	JICA	Agencia de Cooperacion Internacional del Japon
JST	JICA Study Team	JST	Equipo de Estudio JICA
KAP	Knowledge, Attitude and Practice	CAP	Conocimientos, Actitudes y Prácticas
LBW	Low Birth Weight	BPN	Bajo Peso al Naver
M/M	Minutes of Meeting	M/M	Minuta de Reunión
M/P	Master Plan	P/M	Plan Maestro
MSPS	Ministry of Health and Social Provision	MSPS	Ministerio de Salud y Previsión Social
ODA	Official Development Assistance	ADO	Asistencia Oficial para el Desarrollo
O/M (O&M)	Operation and Maintenance	O/M (O&M)	Operacion y Mantenimiento
ORS	Oral Rehydration Salts	SRO	Sal de Rehidratacion Oral
ORT	Oral Rehydration Therapy	TRO	Terapia de Rehidratacion Oral
OTB	Basic Territorial Organization	OTB	Organizacion Territorial de Base
PAHO	Pan-American Health Organization	OPS	Organización Panamericana de la Salud
PDD	Department Development Plan	PDD	Plan Departamental de Desarrollo Economico y Social
PDM	Municipal Development Plan	PDM	Plan de Desarrollo Municipal
PF/R	Prefinal Report	PF/R	Informe Prefinal
PHC	Primary Health Care	APS	Atención Primaria de Salud
POA	Annual Operation Plan	POA	Plan Operativo Anual
PR/R	Progress Report	PR/R	Informe de Progreso
PROSIN	Integrated Health Project	PROSIN	Proyecto de Salud Integral
PRSP	Poverty Reduction Strategy Papers	EPRP	Estrategias Para la Reducción de la Pobreza
PS	Health Post	PS	Puesto de Salud

English		Spanish	
RHF	Recommended Home Fluid	SC	Suero Casero
SBS	Basic Health Insurance	SBS	Seguro Básico de Salud
SC	Steering Committee	CD	Comité de Dirección
SEDES	Department Health Services	SEDES	Servicio Departamental de Salud
SNIS	National Sub-system of Health Information	SNIS	Subsistema Nacional de Información Salud
STD	Sexually Transmitted Diseases	ETS	Enfermedades Transmitidas Sexualmente
SUMI	Universal Health Insurance for Mothers and Children	SUMI	Seguro Universal Materno Infantil
TB	Tuberculosis	TB	Tuberculosis
TBA	Traditional Birth Attendant	TBA	Partera
TC	Technical Committee	CT	Comité de Técnico
TDD	Trinidad	TDD	Trinidad
TFR	Total Fertility Rate	TGF	Tasa Global de Fecundidad
TT	Tetanus Toxoide	TT	Toxoide Tetánico
UNDP	United Nations Development Programme	PNUD	Programa de las Naciones Unidas para Desarrollo
UNICEF	United Nations Children's Fund	UNICEF	Fondo de las Naciones Unidas para la Infancia
USAID	United States Agency for International Development	USAID	Agencia Internacional de los Estados Unidos para el Desarrollo
WB	World Bank	BM	Banco Mundial
WHO	World Health Organization	OMS	Organización Mundial de la Salud
PPL	Popular Participation Law	LPP	Ley de Participacion Popular
WRA	Women of Reproductive Age	MEF	Mujeres de Edad Fertil

Remarks 1: SUMI and DILOS

The Bolivian Government has newly introduced the expanded public insurance for maternal and infant health, SUMI (Seguro Universal Materno Infantil: Law No. 2426) that replaced the SBS at the end of 2002. To secure health service under SUMI, the government has also organized the Local Health Board named DILOS (Directorio Local de Salud) in each municipality for the health administration in place of District Health. According to the Law No. 2426, 10% of annual municipal budget and additional 10% from central government will be allocated to DILOS which consists of 3 members, i.e., City Mayor, SEDES representative and OTB (Surveillance Committee) representative. DILOS is responsible for the health administration including the operation/ maintenance of health/ medical facilities in each municipal jurisdiction

# 1 INTRODUCTION

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