STUDY OF AMBULANCE SERVICES IN NEPAL INCLUDING LESSONS LEARNED & RECOMMEDATIONS

NEPAL SAFER MOTHERHOOD PROJECT

DR. SRI RAM PAUDEL, PH.D. - CENTRE FOR POLICY STUDIES KATHMANDU
NEPAL

NOVEMBER 2002

Options

I. INTRODUCTION

1.1 Dimensions of the Problem

A large number of people in rural areas of Nepal die prematurely every year owing to lack of access to well equipped health care services for immediate treatment of sudden fatal illness, accidents and complications in child birth. The vast majority of such deaths are maternal deaths as a result of pregnancy and childbirth. It is estimated that every 10 minutes of every day a woman in Nepal dies of pregnancy and childbirth. The enormity of the problem is evident from the fact that maternal mortality rate in Nepal is one of the highest in the world. According to Human Development Report 2001, maternal mortality rate in Nepal is 540/1,00,000 whereas it is 410 in India, 440 in Bangladesh, 340 in Pakistan, 60 in Sri Lanka, 55 in China, 170 in the Philippines, 7 in UK and 8 each in Japan and USA[1]. However, experts believe that the maternal mortality rate in Nepal is an underestimate of reality because a large number of such deaths are rarely recorded. The maternal mortality rate is believed to be significantly higher in the rural than in the urban areas, which reflects the lack of access of rural women to medical services. Apart from medical causes there are logistic causes - failure in the health care system, lack of transport, etc and socio-economic and cultural factors which are responsible for maternal deaths in the country.

It has been estimated that about 15 percent of all pregnancies develop complications; and a woman who lives far away from medical services is obviously more susceptible to dying as a result. Although the government has established primary health care facility at each of the 3913 Village Development Committees of the country, and district hospital in each of 75 districts, facilities for complicated obstetrics care are available only in hospitals/nursing homes of urban areas and metropolitan towns. Many villages of Nepal do not have road linkages to the district hospital and even where roads are there these are rough, or even impassable at certain times of the year; transport may not exist or even if exists it is unreliable and irregular. The problem is further compounded by the lack of ambulance service in the area. Therefore, availability of ambulance to transport the mother beforehand or when complications develop to a place with appropriate facilities may help save a large number of maternal deaths.

1.2 Ambulance Services in Nepal

It is not precisely known when the ambulance service was started in Nepal. However, Bir hospital in Kathmandu, the oldest hospital of the country, and a number of social organisations like Nepal Red Cross Society, Paropakar, Rotary Club, etc have been operating ambulance service for a long time back. With the opening of the health sector to the private sector in the early 1990s, nursing homes and private hospitals

[1] Human Development Report 2001, UNDP, New York.

have grown in major urban areas and they have also started ambulance service. Although the ambulance service has increased considerably over the years, its availability continues to vary significantly across districts and localities and to be inequitable. In general, ambulance facility is more readily available in urban areas than in rural areas. There are still several hill and mountain districts, particularly in the mid-western and far- western regions, which do not have even a single ambulance. In these districts the lack of ambulance has been a major problem to transfer women in need of caesarean operation or blood transfusion and other persons in need of emergency medical care to well equipped hospitals or medical centres. A large majority of maternal and other deaths in these districts would have never happened had there been an ambulance service.

1.3 Nepal Safer Motherhood Project

Nepal Safer Motherhood Project (NSMP) started its activities in Nepal in 1997 to support the national programme on safe motherhood. The Project is funded by DFID and its main concern is to strengthen maternity services in district hospitals and Primary Health Centres through capacity building of clinical and non-clinical staff, provision of appropriate equipment and supplies, renovation (or construction) of safe maternity departments and establishment of 24 hour safe blood transfusion centre. The first phase of the Project ran till 2000 and focused on three districts.[2] The second phase commenced in January and due to be completed in March 2004 will focus on nine districts, representing 13 percent of total population.[3] The Project works in association with district and VDC level stakeholders to address the problems through various activities, such as developing village level emergency finance and transport schemes, strengthening VDC management capability, and undertaking a range of behaviour change communication programmes. The Project recognizes transport as a major barrier in improving the access of women with obstetric emergencies to the nearest health facility and referral of complicated cases to well equipped hospitals.

Various donor agencies and organisations have also shown concern to provide ambulance to one or the other organization of the districts not being served or inadequately served by ambulance. The organisations have a tendency to accept ambulance as a panacea to the transport problem for the emergency illness without adequate attention to its management and cost implications. Although it is one thing to acquire an ambulance, the other and also equally important thing is its effective management for uninterrupted and sustained service. But management aspect of ambulance service has not so far been an issue for serious consideration. Since ambulances are operated by diverse organisations in the country, there must be some successes and some failures. It is important to learn from the failures and also recognize the successes for making the ambulance operation a success. Hence, a study of management practices followed by ambulance operating organisations would help to identify the factors, which appear to be associated with successful operation. The

[2] The districts in the first phase included Baglung, Surkhet and Kailali.

[3] The districts in the second phase include three districts of the first phase and Parbat, Myagdi, Nawalparasi, Rupandehi, Jumla and Dailekh.

findings of the study may also be of some value to anyone planning to start ambulance service or in assisting or managing an existing one. It is precisely for these reasons that Nepal Safer Motherhood Project has commissioned the present study.

1.4 Objectives of the Study

The major objectives of the study are as follows:

i. To document the management and maintenance system for the ambulance and identify the factors responsible for the success or failure;

ii. To examine the appropriateness of vehicles currently used as ambulance in terms of topography, durability, local maintenance facilities and patient comfort;

iii. To explore different vehicle options including the feasibility of motorbike ambulances for use in the hills; and

iv. To suggest how the ambulance should be managed and maintained for the sustainability of service with focus on introducing an ambulance in a remote and backward district like Dailekh.

1.5 Study Methodology

The study is based on a survey of 31 ambulance-operating organisations in 7 districts of the country (Annex 1). The selection of ambulance operating organisations was made purposively in consultation with the Nepal Safer Motherhood Project as random selection would not have given different types of ambulance operating organisations with variation in their management, revenue generation, operation system, etc. However, it seemed appropriate to include a few new organisations identified in the course of field visit because they were of a different nature. The field visit of selected organisations was made during the period between June 9 and July 22, 2002. Discussions were held with the Chairperson/concerned officials as well as other staffs and ambulance drivers of the concerned organisations combining participatory approach and interviews (Annex 2). Vehicle workshops were also visited to find out the facilities available at the local level for repair and maintenance of different types of vehicles. The consultant could not visit Dailekh district because of conflict situation and impassable road condition due to heavy rains to assess managerial capability of potential organisations to operate ambulance. So, the assessment is based on secondary information and enquiries with the knowledgeable persons in Surkhet. Similarly, the analysis of options to four-wheel motor ambulance is limited to information that was available in Kathmandu and interviews with the project officer and country director of Intermediate Technology Development Group, Nepal. Much could, however, be learnt from other countries where motorcycle ambulances are firmly established and thriving.

As this study is based on a limited number of ambulance operating organisations in 7 districts of the country, it cannot be taken to represent the total picture of ambulance operation and management in the country. So the findings of this study should be interpreted as indicative of only a small segment of ambulance operating organisations of the country. Nevertheless, it is hoped that the study will provide an insight on ambulance management practices, strategies adopted to make ambulance operation sustainable and key issues in need of resolution, which will be of use to make ambulance service sustainable and efficient. The study findings will also be useful to the organisations intending to start ambulance service in future.

II. GENERAL DESCRIPTION

2.1 Organisations Involved in Ambulance Operation

There is no complete inventory of ambulance operating organisations in the country. In the absence of this information it is not possible to present a comprehensive analysis of ambulance operation in the country. All the organisations permitted to operate ambulance cannot be presumed to be in operation and many organisations previously operating ambulance may have gone out of business. Of the 31 organisations surveyed, five did not have ambulance. The survey reveals that a wide range of organisations with a variety of attributes are involved in operating ambulance service. These organisations vary in regard to various characteristics, such as size, area of operation, range of activities and resource availability. For the sake of analysis, these may be categorized as:

- Government Hospitals
- Private Hospitals/Nursing Homes
- Local Bodies (Municipalities/VDCs/Wards)
- Social Organisations
- Family Trusts

Of the above, Social Organisations constitute the largest number of ambulance operating organisations. These social welfare organisations include Nepal Red Cross Society, Lions Club, Reukayi, etc and these have district branches/units in all/large number of districts. The largest and most diversified of the organisations studied in terms of area coverage by ambulance service and the variety of activities in which it is involved is Nepal Red Cross Society. Nepal Red Cross Society is one of a relatively few, large and multifaceted national NGOs of Nepal with district branches in all 75 districts of the country and also sub-branches in 4 districts. Of these, 45 district branches and 5 sub-branches operate ambulance service in 45 districts (Annex 3). But, in the case of other organisations ambulance operation is limited to one or a few districts only.

As mentioned above, five out of thirty one organisations covered by the study did not have their own ambulance. These are Koshi Zonal Hospital and Bajarang Trust in Biratnagar, BPKIHS in Dharan Siddartha Hospital in Butwal and Surkhet hospital in Surkhet. While Koshi Zonal Hospital in Biratnagar have had no ambulance from the beginning, Siddartha Hospital in Butwal and Surkhet hospital in Surkhet had one but has remained out of operation for the last several years, BPKIHS, Dharan had one but has donated it to Inrawa Hospital and Bajarang Trust had also donated its ambulance to an organisation in Birgunj. The reasons for not continuing the ambulance by these organizations differ:

- Authorities of Koshi Zonal Hospital did not feel the necessity to have hospital's own ambulance because the Red Cross Society, Morang branch has been operating ambulance for the last 34 years without interruption and for the past few years private nursing homes, Biratnagar sub-municipality and Family Trusts have started ambulance service in the area. Patients discharged from the hospital or referred to Kathmandu or BPKIHS requiring ambulance can call it by telephone installed at the main gate of the hospital.

    - The BPKIHS, Dharan donated its ambulance to Inrawa hospital because various organisations started ambulance service in the area and there was also undue political interference for the use of ambulance.

    - In the case of Bajarang Trust, set up by a Marwari businessman of Biratnagar as a family trust, the ambulance operated well for two years but the vehicle had an accident killing a disabled lady and a boy traveling in a self-driven three wheeler, which created a huge furor in the locality. After this shocking incident, the vehicle was kept idle for one and half a year and then handed over to a relative organisation in Birgunj on the condition of operating the vehicle as ambulance. Prior to this also the Trust was charged with smuggling goods from across India under the garb of ambulance.

    - The suspension of ambulance service in Butwal Hospital was also due to accident some 8 years back, which severely damaged the vehicle, and repairing cost was too high to be managed. Moreover, since some 8 organisations operated ambulance in the area with a couple of them always stationed in the hospital premise to transport the discharged or referral patients, need for hospital's own ambulance was not felt.

    - The ambulance in Surkhet hospital has been out of operation because of the high cost of repair.

2.2 Objectives of Operating Ambulance

All the ambulance operating organisations covered by the study cited service delivery to critically ill persons as the main objective of this activity. However, subsequent conversations with some respondents revealed a lack of clarity about how the social motive would be achieved without financial back up. Big organisations like Teaching Hospital, Bir Hospital, AMDA, etc are not much concerned about the financial aspect, whereas other smaller social service organisations and Family Trusts are keen to make it an economic enterprise generating surplus after meeting the operating costs. Several of the organisations had no plans for sustained operation of the ambulance.

2.3 Procurement of Vehicle

Government hospitals, private hospitals/nursing homes and individuals have purchased transport from their own resources, while the social organisations have

mostly obtained vehicle as donation from a variety of national as well as foreign donors including individuals. The internal donors are mainly Kathmandu based and foreign donors including individuals belonging to Japan and India. A summary picture of the types of donor and the organisations covered by the study receiving ambulance is presented below:

Internal

- Inani Organisation (ambulance to Ward No. 13, Kathmandu Metropolitan)
- Kathmandu Round Table No. 1 (half of the cost of ambulance to Ward No. 7, Kathmandu Metropolitan)
- Marwari Sewa Samiti (ambulance to Biratnagar Sub-Municipality)
- Nepal-India Friendship Association (ambulance to Biratnagar Sub-Municipality)

Foreign

- Indian Embassy (ambulance to Itahari Red Cross)
- Fire Fighter Association, Japan (ambulance to Belbari VDC, Morang)
- Oshinigawo, Japanese Individual (ambulance to Dharmodaya of Lumbini)
- Japan Cultural Association (ambulance to AMDA hospital)

Organisations receiving ambulance from the donors have made the initiatives by themselves after exploring the possible donors. Nepal Chemists and Druggists Association Lumbini Zonal Branch purchased anambulance by resources generated through a donation raising campaign from Kathmandu to Birgunj by its members. Various medicine distributors and drug stores in Kathmandu, Bharatpur and Birgunj contributed a sum of Rs. 6,80,000 sufficient enough to purchase the vehicle.

In the case of district branches/sub-branches of Nepal Red Cross Society, a vehicle is supplied by the Central Office on first come first serve basis depending upon grant of vehicles to the Centre by the donors. For obtaining a vehicle, the district branches/sub-branches need to make a request along with the fulfilment of following conditionalities:

- Fixed deposit of a minimum of Rs. 2,00,000.00 in a bank in Kathmandu or the concerned district as main fund.
- Apportioning of 50 percent of total income generated from the ambulance service as depreciation and depositing the same in the main fund.
- Bearing of vehicle transportation expenses from the source of supply and insurance of vehicle
- Interest earned from the main fund should be added to the fund itself.

The district branches/ sub-branches of Nepal Red Cross Society have managed the required deposit amount out of their own resources or donation from

individuals/business communities or grant from District Development Committees and Municipalities or MP fund or staging of cultural programmes.

2.4 Types of Vehicle

A variety of vehicles are used as ambulance, because different donors have provided different types of vehicles and purchase by the organisations and individuals from their own fund also show different choice. The vehicles are, however, either Japanese or Indian made. Only 6 organisations have Japanese vehicles (TU Teaching Hospital, Sunsari Red Cross, Dhankuta Red Cross, Belbari VDC of Morang, Bhairawa Red Cross and AMDA Hospital) and except TUTH , which has purchased Nissan patrol from its own fund, all are donated by different Japanese Organisations. The most popular vehicles are, however, Indian made Maruti Van and Mahindra and Mahindra Jeep. Out of 26 ambulances currently operated by various organisations, 11 are Maruti Vans and 11 are Mahindra and Mahindra Jeeps. The major reasons for a large number of organisations opting for Maruti Van and Mahindra and Mahindra jeeps are the relatively cheaper price, easier to repair and maintain, availability of spare parts, easy to sell and easy to use as a taxi. Other vehicles used as ambulance include Tempo Traveller (Bir Hospital), Eicher (Biratnagar Sub-Municipality, Itahari Red Cross) and big Swaraj Mazda, (Bajarang Trust, which has donated the vehicle to a relative in Birgunj to operate as an ambulance). Except few cases (Toyota Haice of AMDA and Eicher of Biratnagar Sub- Municipality and Itahari Red Cross), the rest have been converted into ambulance by making required adjustments in the vehicle.

A few exceptions apart, organizations have insured the vehicle and the driver.

2.5 Health Equipment in the Vehicle

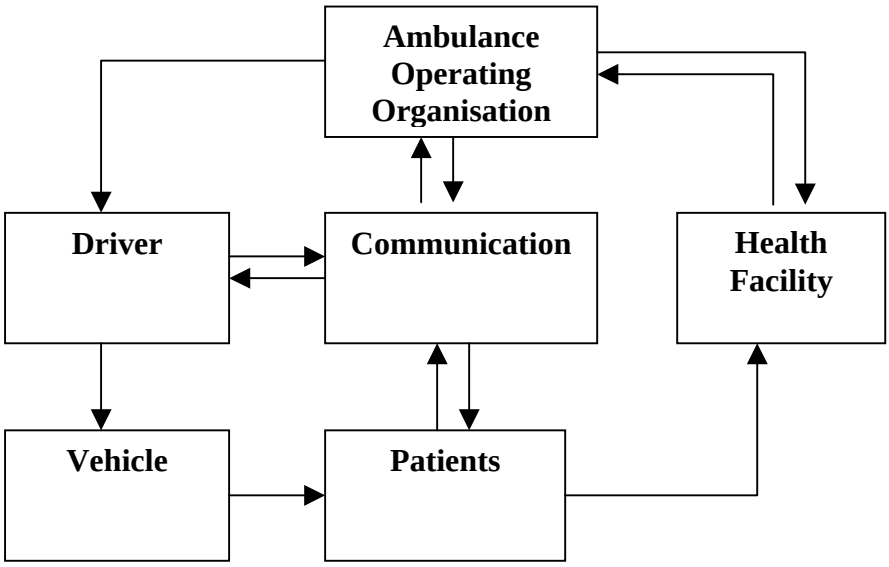
Most of the vehicles do not qualify for being called as ambulances by international standard. Oxygen cylinder is found in only four vehicles. The IV stand, which is a simple thing to install, is not found in all vehicles. The drivers reported hooking the bottle in the window of the vehicle in case of necessity. In the case of Maruti van and Mahindra and Mahindra jeeps, which are the ones mostly used as ambulances, the body is not long enough to allow a stretcher to be conveniently placed in the vehicles for the comfort of the patients. Attending of patients by an auxiliary health worker (nurse/ health assistant) is not a practice. However, hospital or nursing homes operated ambulances availed this service at a cost of Rs. 2,000 per night.

III. MANAGEMENT

3.1 Framework of Ambulance Management

Efficient operation of ambulance services require specific kind of relationship engrained in trust, cooperation and collaboration on the part of provider organisation, drivers and the users. This relationship is more than an agreement between three parties to cooperate and complement each other in the operation of ambulance service. Rather it is a form of cooperation of three parties that involves active participation of the three parties with each other in the cause of saving peoples' lives. This cooperation involves efficient communication system between the users and the providers and good condition vehicle. It is the management that provides the framework for making the system operate effectively with expected performance. A schematic exposition of the
inter-linkages between various parties and factors is illustrated in Fig. 1.

Fig 1: Interlinkages of Various Parties and Factors in Ambulance Management



3.2 Management Practice

The analysis of the ambulance management practice followed by the organisations covered by the study shows three distinct patterns:

- Management by a sub -committee
- Management by transport department/division
- Management by individual persons

In the case of Red Cross, the Central regulation requires formation of a separate committee or sub-committee to look after the ambulance by all district branches/sub-

branches operating ambulance. This has been found to be strictly followed by all Red Cross district branches/sub-branches covered by the study. But there is no regular schedule of Committee meeting and the convener calls meeting whenever major decisions have to be made regarding repair of vehicle, change of driver, fixation of user charge and other issues. The drivers themselves do small repairs and replacement of parts with approval of the convenor. The convenor submits the report of ambulance including income and expenditure in the Executive Committee meetings. In the case of local bodies and other organisations with elected executives like Lions Club, Reukayi, and Nepal Chemists and Druggists Association, Lumbini Zonal Branch a committee/sub-committee is formed for the management of ambulance. In big hospitals like TUTH, and Bir Hospital and nursing homes ambulance is seen as a part of overall transport management along with other vehicles of the hospital under the jurisdiction of a separate Transport Section/Unit usually headed by an Officer level staff. But in the case of Family Trust, usually established in memoriam of the deceased family member, the founder-Chairperson looks after the ambulance. As there are not aspirants to take the Chairman's position, there is not much change in the management.

3.3 Communication System

Communication is a key aspect in achieving the objectives of ambulance service. Systematic communication between the users and ambulance operators not only helps save lives but also contributes to sustainability of service. The ambulance operators need to inform people where the facility is available and how to use it and what to expect. The main channels of information used by the ambulance operators are advertisement in the local newspapers in the city areas and information to PCOs and shops in rural areas. Interpersonal communication is also an important channel in spreading information about the telephone number of ambulance to the community people, particularly in rural areas. In the case of Red Cross, Reukayi and Rotary Clubs, members also serve as key informants about the ambulance of their respective organisations to the people of their respective area. It is observed that telephone is the chief and only means of communication between the users and service providers. In city areas users have no problem in availing ambulance service because of extensive telephone network and multiplicity of ambulances. But the situation is quite different in rural and remote areas because telephone facility is available in limited places and only one or to the most two ambulances exists. People located in interior parts of the district not connected by telephone make call from the PCO, if the facility existed. In city areas the users' choice of particular organisation's ambulance is governed by their preference to seek treatment in particular health facility. Sometimes the choice is also governed by the comfort factor, as indicated by the users' preference for Japanese vehicle (e. g. AMDA ambulance) in Butwal and surrounding areas for longer distance travel to Kathmandu and Gorakhpur. When there is no specific choice, the nearest ambulance is called for to minimize transport cost, which consists of two-way charges.

At the receiving end, receptionist in bigger organisations and office secretary in others (e. g. Red Cross, Reukayi, Rotary Club, etc) receive the telephone calls during office

hours and in case of call for ambulance, inform and instruct the driver accordingly. In hospitals/nursing homes with 24-hour emergency services, night calls are received in the emergency unit and ambulance is sent. In other organisations, the drivers are provided single or two rooms in the office building or office premise with telephone extension for attending the caller and providing service in the night. When the driver is out in the night, the incoming calls are responded to by his family, if staying together or by the night guard or go unattended, if he is staying alone. Only two organisations have installed an I D caller phone set in the driver's room so that a call back could be made to find out whether the ambulance was still required. One of these also has a cordless phone in the vehicle to respond to the caller while the vehicle is moving within the catchment area.

3.4 Vehicle Driver

Ambulance service is basically a driver-based activity. The driver is the one to receive the phone call in the night, drive the vehicle to the caller's place, transport the patient to the stated health facility, collect the charges, maintain the log book and constantly check the condition of the vehicle. Therefore, successful operation of ambulance depends upon competence, commitment, honesty and courage of the driver. Although there is no dearth of drivers in the market, finding the right type is a problem. Organisations have hired drivers through various channels: advertisement and screening, recommendation from a reliable source and personal contact of member/staff of the concerned organisation.

Box 1: Problem with a Single Driver

In one social organisation some months back at around 4 PM the driver was permitted to visit home a few kilometre away from the office to be present at an official demarcation of his land. The secretary of the office, a resident of a few km away, also left for home, as it was almost the end of office hour. The secretary stopped at a local newspaper stall on the way, bought a paper and started to read it. In not less than a minute a woman in the inside room of the stall started crying with stomach pain, and people gathered there suggested calling that organisation's ambulance and some one started to ring. The secretary who was hearing this skipped away with paper in his front in order to save himself from the embarrassing situation before any body could spot him.

Except a few organisations like TUTH, Bir hospital, some Nursing Homes and Wards of Kathmandu Metropolitan, where a driver has 8-12 hours duty a day, other organisations have only one driver to man one vehicle. In the case of Red Cross having more than one ambulance one driver is attached to one vehicle and the night duty is arranged on rotation basis. Some organizations (Reukayi and Red Cross in Surkhet) had two drivers previously but budgetary problem has forced themto keep only one. As a consequence, problems are faced when the driver is ill or is occupied with unavoidable family or social obligations. In some cases drivers arranged their substitutes and in the rest the service remained closed.

Drivers are provided a fixed monthly salary, which differed from organisation to organisation and certain incentives consisting mainly of quarter facility and different types of allowances. The monthly salary of the driver is about Rs. 4,000 in Kathmandu

valley and between Rs. 2,000 to Rs. 3,000 in out of valley districts. There is also a tendency of institutional privacy among some organisations with regard to salary and incentives given to the drivers. The allowance is given in the form of extra amount or Dasain allowance or certain percentage of total income or night traveling/haltage allowance. In some cases night traveling /haltage amount is taken from the patient's party and in others it is provided by the organisation. Some organisations have also created a driver's Welfare Fund with monthly deposit of Rs. 1,000 from the earnings.

3.5 Vehicle Maintenance

Proper maintenance of vehicle is critical to providing service without interruption and also raising revenue for meeting the expenses. A good maintenance system not only reduces the costs of repair and fuel consumption but also increases the life of the vehicle. All the organisations covered by the survey seemed to follow corrective maintenance rather than preventive maintenance. A repair work is done only after there is a breakdown of machinery or parts and not before the need arises. Not a single organization was found to have maintenance and servicing policy for the vehicle. Maintenance and servicing are done at ad-hoc basis and repairing is done only when the problem occurs. Repair and replacement of parts of Indian vehicles are done at local workshops, which abound in adequate number in the town area. Almost all organisations in the eastern districts possessing Indian vehicles reported bringing required parts and materials from Silguri while coming back after transporting patients to hospitals there. Some also suggested repairing the vehicle there. Ambulances operating in Rupandehi also have similar practice. Spare parts of the vehicle are brought from Gorakhpur while returning back after transportation of patients there. However, the Japanese vehicles do not have adequate facility of local repair and the vehicles are sent to Kathmandu for repair if it did not coincide with the time of taking patients to Kathmandu. The majority of the organisations reported servicing of vehicle every 5000 kilometres when the vehicle is new and every 2000 to 2500 kilometres after the engine is changed as per the suggestions of the driver. Servicing is done at the local workshops under the supervision of the driver.

3.6 Service Charges

It is widely held that ambulance service being a purely humanitarian activity should not be profit oriented. However, cost recovery and recurrent cost financing are crucial for project sustainability and replicability. Ambulance operation involves fixed as well as operating costs of the vehicle. Fixed cost is the cost incurred in the purchase of the vehicle and the operating cost consists of fuel, repair and maintenance of vehicle, and salary of the driver. If the vehicle is received as donation, fixed cost is nil, but replacement after its life span would require large amount of capital. So certain proportion of income is usually earmarked as depreciation. As such, the ambulance needs to generate income for cost recovery and financing of operating expenses and the only source of income is the service charge collected from the users. But unlike other commercial vehicles, the scope of ambulance to generate resources is limited to (i) transporting emergency patientsfrom residence to health facility, (ii) referral patients from one to another health facility, (iii) mass casualties and accident cases to health facility and (iv) hospital discharged patients to the residence. Majority of the ambulance operating organisations reported performing the first three activities only and not the last one unless the case required ambulatory service. However, nursing home ambulances, and ambulances in certain areas particularly in Butwal also transport all types of discharged patients to their residence in order to generate income. The charges of ambulance service show inter- district as well as

Box 2: Ambulance Charges in Different Places*

Rate	Fuel	Place/Distance
Kathmandu		
Rs. 10/km	petrol	
Rs. 100 flat	petrol	near places
Rs. 15/km	petrol	
Rs. 75 to Rs. 225	diesel	City area wise
Rs. 50 to Rs. 200	petrol	City area wise
Biratnagar		
Rs. 8900	diesel	Kathmandu
Rs. 2200	diesel	Silguri
Itahari		
Rs. 18/km	diesel/petrol	
Dhankuta		
Rs. 90 flat	diesel	city areas
Rs. 1150	diesel	Dharan
Rs. 10000	diesel	Kathmandu
Rs. 3800	diesel	Silguri
Illam		
Rs. 15/km	diesel	hill fair weather
Rs. 12/km	diesel	hill metalled road
Rs. 12/km	diesel	terai fair weather
Rs. 8/km	diesel	terai metalled road
Bhairawa		
Rs. 20/km	petrol	
Rs. 15/km	petrol	
Rs. 18/km	petrol	
Butwal		
Rs. 18/km	diesel	
Rs. 20/km	petrol/Japanese	
Rs. 20/km	diesel	up to 50 km
Rs. 18/km	diesel	up to 120 km
Rs. 17/km	diesel	> 120 km
Surkhet		
Rs. 125 flat	diesel	up to 12 km
Rs. 12/km	diesel	> 12 km
Rs. 90 flat	diesel	up to 5 km
Rs. 15/km	diesel	> 15 km
Rs. 6000	diesel	Kathmandu

*The rate of different organisations is demarcated by the underline

intra- district variation. Different organizations have different rates in the same district and the same organization has different rates in different districts. Variation in charges of same organisation across districts is self evident as districts vary in terms of topography, and types and condition of road, but variation in charges of different organisations within the same district is hard to explain except in terms of diesel vs. petrol vehicle and Indian vs. Japanese vehicle. The rate is fixed either on kilometer basis or on distance basis. Rate fixed on kilometer basis also vary by mileage and topographyand type of road. Social organizations like Rotary Club and Reukayiand Municipality reported adoptingthe same charges as fixed by the district Red Cross Society.The charges are collected by the driver from the patient's party after reaching the health facility. A receipt is issued to the user with a carbon copy for the office. The collected amount is handed over to the concerned staff of the organisation after two or three days when it becomes a sizeable amount. Sometimes the drivers are in tussle to get the payment as the patient's party tries to evade the charges on the pretext of poverty. While some cases may be deserving, but the drivers find it hard to verify the case on the spot. The most that the driver can ask the non-paying party is to furnish an affidavit of poverty condition along with a request for waiver to the Chief of the organisation upon returning back home after treatment. But very few comply with this request.

The drivers also have problem in collecting charges in situation of road accidents and mass casualties. Although the attending police usually assure collection of charges from the concerned persons later and delivery of the same to the driver, such thing rarely happen in practice. Sometimes the vehicle goes to the caller's place but the caller is not found or the purpose of calling ambulance is already finished (death or safe delivery of child) and has to return back empty handed. Non-finding of callers is mostly due to false calls, which has been a problem in some city areas.

3.7 Concession in Charges

Many organisations have a policy of providing concession in the ambulance charges to the poor people, certain type of illness and executive members of the organisation. There is wide variation in concession offered by different organisations and except Reukayi, concessions given by the same organisation also differ by districts. A picture of the range of concessions and target groups is presented in Box 3. Almost all organisations reported providing free ambulance service in situation of disaster and accidents. Similarly, almost all organisations

Box 3: Range of Concessions and Target Groups/Cases*

Target Groups/Cases		Concession (%)
Cancer patient		25
Executive members		50
Poor persons		10-25
Delivery cases		100
Executive members		25
Poor		50
Board Directors and Depositors		5- 10
Members	city area	50
	outside city	25
Life Member and Staff		5
Death on the way to hospital		25

*Organisations are demarcated by underline

suggested giving concessions to the poor but this was problematic as the user generally claimed to be a poor family only after reaching the health facility. This suggests that ambulances may run into financial problem if users develop a tendency of claiming concessions in the rate in the pretext of poverty condition. Only one organisation provided free transportation of delivery cases within the district. Members of the organisation are given 25 percent concession in most and 50 percent in some cases. Some organisations, particularly the Red Cross reported pressure from the local administration and local political leaders for providing free service to the recommended persons.

3.8 Income and Expenditure

Income of ambulance solely consists of charges collected from the users. Except bigger organisations, such as TUTH, Bir hospital, AMDA, etc. others are found maintaining separate account of income and expenditure of ambulance. District branches/sub-branches of Red Cross Society operating two or more ambulances have separate accounts for individual vehicle. The majority of organisations suggested that the vehicle generates surplus regularly in the first five years, when repair and maintenance do not require much expenses. But thereafter, maintenance cost may be high as parts start to break, and income may not be adequate to meet the operating and repair expenses. The average annual repair cost of Indian vehicle, particularly Mahindra and Mahindra ranges between Rs. 40,000 to Rs. 60,000. If expenses exceed revenue over several years, the fiscal health of the activity may be in jeopardy. Already there are signs of losses in some organisations, posing a serious question in the continuity of service. However, organisations having other income sources have not faced much difficulty in financing of ambulance operating cost. Some examples are:

- Dharmodaya of Lumbini, established for propagating Buddhism, raises money through various sources: registration/renewal fee from patients seeking medical treatment in its Clinic operated since 1993, with regular service of a Health Assistant and weekly service of a medical doctor and free distribution of medicines received as donation from Lingston Temple, Vietnam to the patients, donation received from national as well as international organisations, and return from vast tracts of land donated by various persons to the organisation.

- Ward No 7 of Kathmandu Metropolitan raises income by way of registration/renewal fee from patients seeking primary health care in its clinic served by one Health Assistant and one Assistant Nurse Midwife, who are under the pay roll of Kathmandu Metropolitan, gets fuel and one driver's salary and the repair cost from the Metropolitan, and collects contribution from the contractors working in the ward.

- Ward No 13 of Kathmandu Metropolitan, has stopped the health clinic for lack of fund. However it has a small three storey building on the roadside

and earns some rental income. In the initial period one local petrol pump had provided free fuel to the ambulance for one year.

- The Lions Club of Danta Kali of Dharan and Rotary Club of Butwal generate some income by organizing eye camps with donor support.

- District branches/ sub-branches of Red Cross Society also generate some income from other programmes.

- The Reukayi also gets salary of ambulance driver and fuel from the Central Office.

In the larger city areas such as, Kathmandu, Biratnagar, Bhairawa and Butwal income of ambulances has been declining because of competition among themselves and competition from private taxies. There seems to be excess number of ambulances in these cities, which has resulted in declining incomes to all. These cities are also served by private taxies, which also transport patients to the hospital. In Dhankuta ambulances have remained largely underutilized because local vans transport patients to hospital at cheaper rate than the ambulance. Similarly in Surkhet, ambulances of Red Cross and Reukayi remain unused most of the time, whereas a private van operated by a medical shop hardly remains unused. A question arises as to why social organisations like Red Cross and Reukayi are not able to operate ambulance with financial soundness as compared to private medical hall. One reason could be aggressive public information campaign by the latter in the villages about the availability of vehicle and treatment facility in the shop. Another reason could be people's impression that the vehicle of the shop is more dependable, as there has been suspension of Red Cross and Reukayi ambulances in the past. The Red Cross ambulance had to be towed in a truck to Nepalgunj for repair some months back and service remained suspended for about a month. Similarly, the Reukayi ambulance was out of operation for about three months due to accident of the vehicle. The repair cost was about Rs. 50,000 and had to be arranged by borrowing from the borrowing from the Centre because of resource constraint. Another possible reason could be the single driver in Red Cross and Reukayi, causing suspension of ambulance service in their absence. This might have also eroded people's trust in the ambulance service of these organisations. Thus it appears that private taxi- cum ambulance of medical hall has prospered out of the inefficiency of public and the NGO sector organisations and lack regulatory mechanism to control unauthorized ambulances.

As mentioned earlier, prevalence of excessive number of ambulances in some cities, particularly in Butwal and Biratnagar- Itahari has resulted in reduction in income to all. In order to remain used, some ambulances were reported to have made unfair deals with the concerned hospital staff in Biratnagar and Butwal to be called for transportation of discharged patients and referral cases. In Biratnagar, Itahari and Dharan ambulances have a tendency to respond to calls for taking the patients to longer distance destinations, such as Kathmandu and Silguri of India because of high

income. But movement of vehicle to India is not free, as it is mandatory to obtain permit from the Indian Embassy.

Box 4: Private Taxi Cum Ambulance

In Birendra Nagar Municipality of Surkhet district, Reukayi and Red Cross operate one ambulance each. A medical shop, which also operates clinic simultaneously providing primary health care and MCH services also operates a maruti van for transportation of patients from the villages. The city does not have taxi service to go to the villages but vehicles (Mahindra and Mahindra) can be rented for long distance journey, such as Nepalgunj, Kathmandu, Dailekh, etc. Although the city area is small, some 16 VDCs of the district are connected to the district headquarter or the high way by motorable road.

The medical shop was opened some 10 years back and the owner is trained as Health Assistant. The vehicle was purchased one year back as a private vehicle with payment of full customs duty. The vehicle has only sitting seats and a patient can hardly lay down. People call the van from villages located as far as 40 to 45 kilometres for transporting patients to the medical shop for treatment. The shop has arranged a couple of other health workers and previously a medical doctor also used to serve there. The patients are examined and medicine prescribed to be purchased in the shop. Cases not within the capability of medical persons there are transported to the hospital just 1 km far from the shop. The van remains busy all through the morning for bringing patients to the shop and taking them back home. The vehicle is also called during day and in the night. It has a driver, but the owner and his three brothers also drive the vehicle. There is no interruption of service even if the driver is absent and the vehicle is constantly inspected and kept in condition. The rate is Rs. 100 flat within the city area and Rs. 15 per kilometer outside the city. The rate is slightly higher than that of Reukayi and almost the same as Red Cross. The vehicle is generating a surplus of about Rs. 10,000 per month after meeting all the expenses. There is also an increase in income due to increased sales of medicine.

Ambulances operated by nursing homes present a different story. The ambulance is used to provide transport facility exclusively to the nursing home patients and serve other purposes. The call for ambulance is made by patients to seek treatment in the particular nursing home. It is also used for transportation of discharged patients as well as patients requiring regular check up. So apart from transport charges, ambulance contributes to increasing income in the form of charges of medical services. Other purposes for which the ambulance is used are transportation of goods and materials and movement of medical as well as non-medical staff.

3.9 Comparative Analysis of Vehicle Options

With the exception of a few organisations, which have Japanese vehicles, the rest have Indian vehicles. The Indian vehicles are of mainly two types, Maruti van and Mahindra and Mahindra Jeep. The major reasons for large number of organizations opting for Maruti Van are relatively cheaper price, easy to repair and maintain, availability of spare parts, easy to sell and easy to use as taxi. Its main defects as ambulance are difficulty in plying into muddy and rough roads and not strong

enough to withstand strong wind and heavy rain. This vehicle is considered good for the city and plain area only. As in the case of Maruti Van, Mahindra and Mahindra Jeep is also easy to repair and no problem of spare parts but has the advantages of diesel engine and four-wheel drive. So this vehicle is fit to ply in rough roads and also the interior parts of terai having dilapidated roads. Its main defect is high vibration in start up, which may be irritating and also damaging to the patients and quick wear and tear due to low quality iron plates. A common defect of both Maruti van and Mahindra and Mahindra is a little bit short body to put the stretcher conveniently in the vehicle for the comfort of the patient. A comparative analysis of these vehicles is presented in Box 5.

Box 5: Comparative Analysis of Vehicle Options

Vehicle Type	Cost	Fuel	Area	Maintenance	Defects
Japanese	High	Petrol	Hill & Terai Fit for all types of roads	-In selected places -Problem of spare parts in small cities	Costly spare parts
Maruti Van	Moderate	Petrol	Terai & Plain Not fit for muddy and rough roads	Smaller Cities	-Light body to withstand strong wind and heavy rain. -Short body
Mahindra Jeep	Moderate	Diesel	Hill & Terai Appropriate for rough roads	Smaller Cities	-High vibration in start up -Short body -Quick wear and tear due to low quality iron

3.10 Factors for Success

The assessment of success of ambulance operation poses the question of how, and in what terms is the success of this venture to be assessed and can the success of any organisation be replicated in other areas? A range of issues needs to be judged to answer the question of success. The most straightforward, and the most central issue, is to see whether the ambulance is doing what it set out do; and whether it is able to earn income sufficient enough to meet the operating expenses and accumulate depreciation fund to replace the vehicle when it is obsolete.

Judged in terms of this criterion, only a couple of organisations are found to be operating ambulance service successfully. Ambulances initiated and managed by public organisations and large NGOs are found rather removed from the context they seek to improve because of the tendency to take the matter as official, lack of incentives for improving efficiency and lack of accountability. On the other hand,

smaller organisations, which emerge from within the particular context and rooted in their environment and organisations with ideological and moral base, have a better performance. Smaller and ideologically based organisations have greater flexibility and environment to make quick adjustment to the problems and a stronger dedication to the cause. There is also little chance of misuse of vehicle for personal interest or pressure from the local political leaders for free ambulance service. The important factors that seem to be critical for the successful operation of ambulance are the kinds of persons who man the organisation and take crucial decisions, commitment of the staff to the work, and the person who drives the vehicle. It is the foresight, progressive attitude, honesty, discipline and entrepreneurial ability of the members of the organisation and the driver that makes the ambulance operation a success. Monetary factors are also important because unless received in the form of donation, purchase of vehicle costs a minimum of Rs. 7,00,000 (Mahindra and Mahindra Jeep/Maruti van),

Box 6: Success Case 1

The Lions Club of Dantakali of Dharan started ambulance service in 1995 with the objective of social service and also revenue generation to the Club. The vehicle (Mahindra and Mahindra) was purchased with investment contributed by its 26 members. The choice of Mahindra and Mahindra vehicle was made on the ground of its strength to ply in rough and bad roads of surrounding hill areas of the district. The club also organizes eye camps and Blindness Elimination Campaigns with support from Lions International and earns some income for meeting office expenses. But the Club does not have its own office and meetings are held in Chairperson's house or school building.

A member of the Club is entrusted with the management of the vehicle, which he mainly drives himself as well as his son occasionally as the other driver. The salary provision is made for two drivers at the rate of Rs. 4000.00 per person per month. This man previously worked as a truck driver and also served as driver of Reukayi ambulance. Because he also has stake in the vehicle, which is also a source of bread and butter for him and his family, constant attention is paid to how well the vehicle can be maintained. The driver is constantly concerned to detect and correct problems of the vehicle, which affect or could affect the continuity of service and hence his income. The driver is authorized to carry out repair works and service the vehicle, as deemed necessary from the income collected as charges. He is required to justify the need for repair along with the receipts of expenses. So far, vehicle engine has been changed two times entailing a cost of Rs. 1,00,000.00 and tyres have been changed 3 or 4 times.

The vehicle hardly remains idle, as it is constantly called for the service. Calls are received from the hill areas and interior parts of the district, because city areas, such as Itahari are well served by ambulances. Information about the ambulance service is disseminated through advertisement in the local newspaper and listing phone number in the PCOs of the district. The monthly gross income from the ambulance is in the range of 20,000.00 to 25,000.00. The account of ambulance income and expenditure is maintained separately. The vehicle is kept at driver's house and the vehicle is equipped with a chord less phone to receive calls when it is moving in the city area. At the house of the driver an ID caller set is installed to call back the callers when the vehicle is out of station and also to trace the false calls.

which has to be arranged by the organisation. But even if vehicle is received under donation and the organisation has other income generating assets, ambulance operation may not be successful in the absence of commitment, honesty, managerial prudence and incentives for improving efficiency. The case studies of Rotary Club of Dantakali of Dharan and Dharmodaya of Lumbini demonstrate what factors make the ambulance operation a success.

Box 7: Success Case 2

Dharmodaya of Lumbini, which is at a distance 5 km from Bhairawa main road towards Lumbini, is one of the branches of Dharmodaya established in Kathmandu to promote Budhisim and carry out Buddhism related activities. The Dharmodaya of Lumbini was set up in the birthplace of Buddha to spread Buddha's philosophy through various religious and social activities. The Organisation started Dharmodaya Health Clinic to provide primary health care services to the people of surrounding rural areas of the temple. The clinic has a Health Assistant on regular pay roll and a qualified physician provides free service once a week. The patient flow is 50 to 60 persons per day. The patients are charged Rs. 5 for registration and Rs. 2 for revisit. The organisation receives medicine under donation from the Lingston Temple of Vietnam and distributes free to the patients. The organisation started eye camps since 1999 and in that context it received an ambulance (Maruti van) from a Japanese individual, Oshinigawo, of Nippon -Nepal Goodwill Association.

The operation of ambulance is entrusted to a sub-committee comprising 5 persons under the Chairmanship of the Vice- Chairman of the Organisation. The sub-committee presents the progress report of ambulance in the Executive Committee meeting of the Organisation. The driver is also a resident of nearby place, but he lives in the quarter provided free of cost within the complex of the organisation. He carries with him 16 years driving experience in Lumbini Development Trust and two years experience in Saudi Arabia. The driver is provided a monthly salary of Rs. 3,000 and free accomodation within the office complex.The duty is 24 hours and when he is out to attend the call, the watchman receives the incoming calls.

The vehicle is mostly busy attending 4 to 5 calls per day. The ambulance is called by people of 7 VDCs of Lumbini district. However, it does not receive calls from Bhairawa and Butwal. The ambulance has also transported patients to Kathmandu and Gorakhpur. The office manager often accompanies the driver when the ambulance is called in the night. One year back the vehicle had an accident while on way to take the patient. It was repaired out of the insurance claim. It was known later that if the accident and the damage of the vehicle were reported to the donor, a new vehicle would have been granted to the organisation. Thus the organization is in good book of donor. The organisation is considering purchase of another ambulance to maintain continuity in service when one out is of station to transport the patients or out of operation for repair and maintenance.

The Dharmodaya has abundant resources in the form of land and cash donations from various individuals as well as national and international organisations. The backing of foreign donor and the commitment to social service with concern for propagating Buddhism have made ambulance operation a successful activity.

3.11 Lessons Learned

It might be unfair to expect a replication of the structure of success cases as these are tied in with their specific contexts. One cannot expect that the Lion's Club of Dantakali of Dharan or Dharmodaya of Lumbini or any other organisation could be replicated like biological cells. Instead of replications of success cases, the lessons learned can be applied to other contexts to operate and manage ambulance services. The major lessons learned from various cases are as follows.

i. **Management Committee:** A management committee comprising three to five persons representing main sections of the society and local bodies should be set up to look after the operation of ambulance.

ii. **Creation of Ambulance Fund:** An Ambulance Fund must be created and maintained by adding certain proportion of net annual earnings from the ambulance and funds received as donations from individuals and organizations.

iii. **Mobilisation of Local Support:** Local support should be mobilised in various forms, such as contribution in terms of fuel or driver's salary from the businessmen, free petrol from local petrol pumps, contributions from the MP fund and VDC/Municipality grant provided by the central government and contractors working in the area.

iv. **Community Participation:** Community participation in the management and operation of ambulance is key to its future sustainability. This can be achieved by representation of community people in the Ambulance Management Committee and raising fund for ambulance operation from each household located within the service area.

v. **Effective Communication:** Widespread information campaign should be initiated to make the people aware of the availability of ambulance and to encourage them to call for and use it in case of emergencies. Public Communication Offices and village shops/ tea stalls are the right places for disseminating information about the ambulance to the local people. Mobile phone in the vehicle would be an added advantage. If mobile phone is not possible, chord less phone is desired.

vi. **Account Keeping:** The income and expenditure of ambulance should be maintained separately.

vii. **Choice of Vehicle:** The choice of vehicle must be made in terms of the topography and road condition of the area where the ambulance is to be stationed and service to be provided.

viii. **Maintenance of Vehicle**: Vehicle must be kept in good running condition by undertaking maintenance before the need arises and detecting the possibility of unanticipated breakdown with the help of instruments, such as vibration analysers, amplitude meters, gauges, etc.

ix. **Selection of Driver:** Driver must be a local person, committed to social service and courageous to travel in the night and also long distances, backed by the support of the family members.

x. **Two Drivers:** Organisations operating a single vehicle should have two drivers.

xi. **Training of Driver:** The driver should be given basic training in emergency health care.

xii. **Insurance of Driver and Vehicle:** The driver and the vehicle must be insured.

xiii. **Incentive to the Driver:** The driver should be provided incentive in the form of certain percentage of net annual earnings from the ambulance and creation of welfare fund out of income earned every month.

xiv. **Maintenance of Logbook:** A logbook must be maintained showing the necessary details of every movement of the vehicle.

IV. ALTERNATIVES TO FOUR-WHEEL MOTOR AMBULANCE

4.1 Background

The four-wheel motor ambulance has obviously a part to play, but the ambulance need of rural population of Nepal could be met by the use some simple small-capacity vehicles. There are many types of small capacity vehicles ranging from animal propelled carts, bicycles and other pedal driven vehicles, motor vehicles based on motorcycles up to agricultural tractors. Of these the appropriate ones to be used as ambulances in the rural areas appear to be bicycles and motorcycles. Such simpler vehicles would have two advantages: firstly, the lower axle loads could result in savings in road construction costs by building to lower design roads, and secondly, such vehicles will be simpler, cheaper, easy to repair and maintain, and affordable by all.

In developed countries like USA, motorbike ambulances are used in some cities to provide immediate life saving treatment to the injured persons in road accidents until the ambulance comes to take the injured persons to the hospital. The motorbike ambulance is quicker to reach the spot, as it can penetrate even through narrow passages where vehicles cannot pass and make its way even in traffic jams and administer the life saving methods and drugs. The motorbike ambulance is driven by a para-medico with an assistant in the pillion. The operational mechanism of the motorbike ambulance is not, however, precisely known, but it is worth studying.

In some African countries, bi-cycle ambulance has been developed and put into use in rural areas to carry complicated pregnancies, unexpected epidemics, and accident and snakebite cases to a qualified local health clinic or town hospital. Rural transport in Africa, as in any rural area of an underdeveloped country, is characterized by the lack of affordable and reliable means of transport. Motorized vehicles are very rare and too expensive to be affordable by the poor and stretcher groups transport patients from the village to the clinic by carrying them on a stretcher even over longer distances up to 30 km. The management of such long trips require 12 or more people for sharing the load. This was time-and energy-consuming activity and sometimes the patient died on the way.

However, the experience with bicycle ambulance in a couple of African countries, where it has been introduced does not reveal all success. The case of Jinja/Uganda shows some success, whereas the case of Nsanje/Malawi shows a failure. A study conducted in Nsanje/Malawi found that many ambulance trailers were lying idle in

many health centres of Nsanje district.[4] The main factor that deterred pregnant women from using the bicycle ambulance was the cultural taboos.

4.2 Intermediate Technology Development Group, Nepal

The Intermediate Technology Development Group, Nepal headquartered in London, is working in Nepal since 1979 to improve the lives of poor people through research, application and dissemination of intermediate technologies in various activities that are of concern to the poor. The term is associated with the work of E. F. Schumacher, who defined Intermediate Technology as being " simple, low-cost, labour-intensive and decentralized". Nepal Office was formally established in 1991 and is headed by a Country Director. ITDG Nepal concentrated on energy sector, particularly hydropower for about two decades and has diversified its activities to include agro-processing and rural transport. The transport programme is focused on developing non-motorized bicycle based transport, appropriate river crossing technologies and appropriate means of transport in the hilly areas.

4.2.1 Bicycle Transport

One area, in which Nepal can boast of spectacular achievement in the last 40 years of planned development, though with foreign support, is the road network stretching from east to west and north to south direction. This has opened up road access to many villages, but there are so many other villages, which are not touched by the road. These villages are still remote due to the lack of access to the road and several hours walk is required to reach the nearest road point. For this reason rural poor farmers have to face a lot of difficulty in carrying their farm produces and livestock products from their villages to the road heads and urban centres. In order to address this problem, ITDG Nepal developed bicycle trailer based on Sri Lankan design for use in plain areas having feeder roads. The trailer can be added to any type of bicycle and separate designs are made for males and females. The bicycle trailer has been introduced in Makrahar VDC of Rupandehi district and Niglihawa VDC of Kapilbastu district. The users are reported to be quite satisfied with the bicycle trailers. The cost of a trailer is about Rs. 3900.

4.2.2 Bicycle Ambulance

Encouraged by the success of bicycle trailer, ITDG Nepal developed bicycle ambulance to transport sick persons and women with delivery complications in rural terai to the nearest health facility. It is also like a bicycle trailer, which can be fitted to or detached from any bicycle. While designing the prototype, local communities of Rupandehi and Kapilbastu, Rural Transport Committees, NGOs like Friends Services Council and RISE were consulted. Several refinements have been made in the design to make the trailer more comfortable to the patients. For example, in latter designs shock absorber has been introduced to absorb the jumps and bumps in the road.

[4] Kingsley Lungu, et.el, "Are Bicycle and Community Transport Plans Effective in Strengthening Obstetric Referral Systems in Southern Malawi"? Safe Motherhood Project, Blantyre, Malawi, Mimeo. 2000.

Further improvements consist of installation of folding canopy to protect the patients from exposure to the sun and the rain.

The bicycle ambulance is also introduced in the same VDCs, where the bicycle trailer has been introduced. A total of 10 ambulances - 6 in Makrahar and 4 in Niglihawa are currently in use. The mechanical engineer of ITDG designed the prototype of the trailer and the engineering work was done by a local engineering workshop in Bhairawa. Presently three different designs are available, which range in price from Rs. 4,200 to Rs. 5,000.

The bicycle ambulance is said to have a number of advantages:

i. Accessible to everyone in the village
ii. Low charges and hence affordable even by the poor
iii. Financially sustainable: low fixed as well as running cost for the community
iv. Manageable by one or two persons
v. Appropriate technology: easy handling and repair

However, in the absence of studies conducted to assess the impact of bicycle ambulances, it is not possible to come to any conclusive evidence on their effectiveness.

4.2.3 Motorbike Ambulance

ITDG Nepal is also considering development of motorbike ambulance as an alternative to motor ambulance. The motorbike ambulances are perceived as faster and more comfortable than bicycle ambulances. But development of motorized vehicle requires permission from the government and ITDG is in the process. It is considering designing a trailer to be attached to the 90 cc Trail Honda. Trail Honda has been chosen because of the strength as well as durability of Japanese engine to run in the rough and muddy roads. Currently engineers of ITDG Nepal are studying designs of different countries for adaptation to Nepal's conditions. ITDG Nepal has an experienced engineer with BE in Mechanical Engineering from India and MBA from Nepal, who is assisted by a young mechanical engineering graduate. The organisation has the capability to develop prototypes of motorcycle ambulance, supervise the fabrication work and put the ambulance into use. However, because the motorbike ambulance is a three-wheeler, it is susceptible to lose balance in bad and bumpy roads, which characterizes the road conditions of many hill districts of Nepal. It is also considered to be appropriate for the plains and some hill areas having roads with even surface.

V. AMBULANCE IN DAILEKH

5.1 Background

Situated in the mid-Western Development Region, Dailekh district is bordered by Surkhet, Jajarkot, Kalikot and Achham districts. It has an area of 1,502 square kilometers distributed over 55 Village Development Committees. According to 2001 Census, the population of Dailekh is 2,25.2 thousands and the total number of households is 41,140. The average household size is 5.47, which is close to national average. Of the total population, males constitute 48.9 percent and females constitute 51.1 percent[5]. By all socio-economic indicators, it is one of the poorest hill districts of the country. In the Human Development Report of Nepal 1998, this district, with human development index of 0.246, is listed at 65th position from the top out of 75 districts of the country[6].

The district head quarter, also called Dailekh, is connected to Surkhet district by a fair-weather road stretching 67 kilometres. It takes 6 hours drive for the passenger bus to reach Dailekh from Surkhet. One-way fare from Dailekh to Surkhet is Rs. 200. Vehicles ply on the road only in dry season from October to June. Six passenger buses from Surkhet and equal number of buses from Dailekh ply on the route daily at one hourly interval during the dry season. However, with the start of monsoon, bus service is suspended and other vehicles also stop plying on the road because of high water level in river Chupra. There is, however, a suspension bridge over the river for pedestrian crossing. During rainy season, a large portion of road is converted into squelching mud and buses plying over the mud make track to be followed in the dry season also. There is no regular maintenance and smoothening of road surface after the rainy season.

The district has one hospital (Dailekh District Hospital, located in the district headquarters), two Primary Health Care Centres, nine health posts and 49 sub -health posts. The district hospital has a sanctioned post of one district health officer and one medical officer, but they are not always present. The sanctioned post of Staff Nurses is three, and two are filled but both staff nurses are never available in post.

5.2 Need for Ambulance

A recent study carried out by NSMP shows that total number of live births in the district is 7732, and the annual number of expected maternal death is 42[7]. Although normal delivery care is available in the hospital 24 hours a day, but Basic Essential Obstetric Care (BEOC) and Comprehensive Essential Obstetric Care (CEOC) are never available and such cases are referred to Surkhet or Nepalgunj hospital. The maternal death in the district, as in other parts of the country, is usually the outcome of chain of

[5] National Population Census, Summary Sheets 2002., Central Bureau of Statistics, Kathmandu.
[6] Nepal Human Development Report 1998, Nepal South Asia Centre, Kathmandu.
[7] Needs Assessment Report: Dailekh District, Nepal Safer Motherhood Project, May 2001, Kathmandu.

events and disadvantages throughout a woman's life, not least of which is her lack of access to obstetric care. So an effective action is needed on different fronts to halt this silent and unnecessary toll of lives.

There is no motorable road linking VDCs of Dailekh district to the district headquarters and only 18 out of 55 VDCs are within the catchments of the district hospital.[8] Women with delivery complications in a large number of VDCs reach district hospital in stretcher, dokos, dolas or human back. Women with complicated delivery referred by the district hospital to Surkhet hospital or to Nepalgunj have difficulties reaching the referred health facility. Transport is a major issue. As there is no ambulance in the district, they have to travel by bus, which may further complicate the delivery problems and it may be even take a toll of woman's life. So, while there is a need to strengthen technical capability of Dailekh hospital in terms of trained health personnel, drugs, equipment and instruments, and physical infrastructure to provide obstetric services, there is also a need of an ambulance in the district to transport complicated delivery or emergencies to Surkhet or Nepalgunj hospital. Non-availability of an ambulance has also been perceived by the District Health Office as one of the major obstacles to transport women in need of caesarean operation or blood transfusion from Dailekh hospital to Surkhet or Nepalgunj hospital[9]. Since no organisation is taking initiative to run an ambulance in Dailekh probably because of high fixed capital cost as well as high operating cost, it is desired that NSMP provide a vehicle to an appropriate organisation for operating as an ambulance. This would be fitting with the NSMP's objective of improving maternal health in the district. The project has already started its activities in the district and it would be quite timely to start an ambulance service to strengthen the maternity services.

5.3 Appropriate Vehicle

Presently emergency cases from Dailekh are transported to Surkhet by bus during dry season and in doko or human back during rainy season. Ambulance of Reukayi of Surkhet is often called from Dailekh to transport emergency patients down to Surkhet or Nepalgunj. But the problem is that one or the other part of the vehicle is out of order, such as breaking of spring plate or leakage in fuel tank, while plying back and forth between Surkhet and Dailekh because of the bad road condition. This has happened to Reukayi ambulance. The possibility of breaking of parts is high if the vehicle is 3-4 years old. The income generated is about Rs. 1,200.00 to 1,500.00 and the cost of repair usually comes to be about Rs. 1,000.00. So the ambulance operating organisations in Surkhet are somewhat hesitant to provide the ambulance service, when called from Dailekh. Moreover, the fare of ambulance is beyond the reach of poor people.

[8] VDCs within the perimeter of a distance of a two- day walk from the hospital is defined as lying within the catchment of the hospital. (Ref. Needs Assessment Report).

[9] Needs Assessment Report, op. cit.

Discussions with knowledgeable persons in Surkhet revealed that four-wheel vehicle is needed for plying between Surkhet and Dailekh. They felt that light vehicles, such as Maruti van are not suitable because of utterly bad road condition. Their recommendation is Japanese vehicle in view of durability of parts and longer life span of the vehicle. Alternative to this is the Indian Mahindra and Mahindra jeep, which is the most popular vehicle, as is used by a large number of organisations.

5.4 Repair and Maintenance Facility

There are three workshops in Surkhet for repair and maintenance of vehicles. Running materials of Indian vehicles, such as Maruti van and Mahindra and Mahindra jeep are readily available in the workshops but expensive parts and materials are brought from Nepalgunj as and when needed. The workshop owners also claimed to be doing minor repairs and replacement of some running materials of Japanese Toyota and Mitsubishi Jeeps, but it is difficult to believe that they can do so.

For major repairs, and replacement of bigger and expensive parts all vehicles are taken to Nepalgunj, where relatively bigger workshops are available. Nepalgunj being the regional headquarters of mid-Western Region and a hub of industry, commerce, etc, considerably larger numbers of vehicle of different country origin are in use. Accordingly there exist bigger workshops with skilled mechanics to repair and service all types of vehicles. There are two big workshops in the Industrial Estate and several in the market, of which three to four are bigger ones. For Indian vehicles there is no problem of unavailability of spare parts as these are quickly procured from across the border in case of depletion of stock in the garage or the shop. The bigger workshops were observed repairing Japanese vehicles of different models. They said that they could do all types of repair and replace any part of the Japanese vehicle of any model. When asked about the non-availability of any spare part/material at any point of time, they replied placement of order in Kathmandu by phone and by next afternoon the part/material would arrive there at no extra cost to the customer.

5.5 Organisation to Manage the Ambulance

It has not been possible to assess the capability of governmental and non-governmental organisations that could be considered for the operation of ambulance in Dailekh. The organisations that could be considered are the district hospital, or district Red Cross Society. Whichever organisation is chosen for operating the ambulance service, a pragmatic management system should be designed and put into practice. An "Ambulance Management Committee" consisting of representatives all concerned organisations should be constituted and entrusted with the responsibility of managing the ambulance. The Committee will monitor use and maintenance of ambulance, thereby controlling its misuse and ensuring sustainability. For the sustainability of the service, it is important that an Ambulance Management Fund be created with contributions from the DDC, DHO and the VDCs within the catchments of the ambulance and general public as well as businessmen of the district. Since the overwhelming majority of people in the district are poor and they may be the ones to

require ambulance service, there is little prospect of revenue generation through charges to meet the running costs of the vehicle. So it is necessary to devise a system of concessions to the poor and disadvantaged communities and explore sources of fund for this provision.

VI. MAJOR ISSUES AND SUGGESTIONS

Ambulance is a critical determinant in providing individuals with immediate treatment for sudden illness, injuries and delivery complications. This is particularly so in a country like Nepal where advanced medical treatment is available only in limited urban centres. The Maoists have also honoured hospitals and ambulances even in their attacks, which have been intensified in the last one year. Although increasingly larger number of organisations is operating ambulances in many different areas, some working over longer and some shorter periods, but very few appear to be successful in terms continuity and sustainability of the service. What are the major issues in ambulance management that emerge from this study and what are the policy recommendations implied by these issues? An attempt is made in this chapter to answer these questions and bring to the forefront the main issues that have to be addressed for smooth operation and continuity of ambulance.

6.1 Issues

6.1.1 Financial Viability

Ambulances cannot be managed like a business, with strict attention paid to their financial viability because of social objective. Owing to their unique functions, such as service provision only when called upon and concessions to poor and members of the organisation, and free service in situation of accidents and mass casualties, they are constrained to maximize income. So the issue is how to make ambulances financially viable? Although bigger organisations having other sources of income are able to maintain financial viability by transfer of resources from other activities, smaller organisations are in a very difficult situation.

6.1.2 Vehicle Maintenance

In most organisations maintenance is done when the vehicle develops problems. No attention is given to preventive and predictive maintenance. This has resulted in high cost of repair and discontinuity of service. This problem is particularly evident in public organisations and big NGOs. These organisations seemed to depend on driver for the maintenance and repair of vehicle.

6.1.3 Problem of Single Vehicle

Organisations with a single vehicle are constrained in providing service to other needy persons when it is way and the situation becomes more awkward when it is away for a longer distance service. And service continuity is disrupted when the vehicle is stationed in workshop for repair and maintenance. This problem is quite acute in areas served by a single ambulance and absence of other means of transportation. On the other hand, it is not much of a problem in large cities because such cities are better

served by ambulances and people also have access to alternative means of transportation.

6.1.4 Problem of Single Driver

Organisations having single driver have difficulty in providing ambulance service 24 hours a day through out the year. The driver is also under stress to be on duty 24 hours a day all through the year.

6.1.5 Problem of Competition

Ambulance service is characterized by excess number of vehicles (excess capacity) in some places and lack of a single vehicle or inadequate number of vehicles in some other places. For example, there seems to be excess number of ambulances in some city areas such as, Itahari-Dharan, Biratnagar, and Butwal-Bhairawa, whereas many other areas do not have a single ambulance or have inadequate number of ambulances. A relevant question is whether excess capacity and competition in ambulance operation is desirable from the viewpoint of service continuity ? It is argued that competition among ambulance operators would increase consumer choice and satisfaction and drive down cost by increasing efficiency. But it is also possible that competition among vehicles may eventually lead to a situation where all carriers operate at a loss or some may be forced to stop the service or resort to unfair practices as is evident from the case in Butwal. So whether the ambulance service should be allowed to expand indefinitely in certain areas already having a large number of ambulances or should it be regulated is a serious issue to be considered by the government.

6.1.6 Problem of Indian Permit

Ambulances require permit from the Indian Embassy to carry patients across the border. It is found that ambulances in Biratnagar, Itahari, Dharan Dhankuta and Illam often have to go to Silguri, ambulances in Bhairawa to Gorakhpur and ambulances in Surkhet to Lucknow. The permit is issued by the Indian embassy in Kathmandu on quarterly basis. Photocopies of various documents, such as blue book, insurance, and recommendations of District Health Office need to be submitted along with the application for permit. Many organisations have found this very inconvenient, costly and often causing interruption of movement to India, should there be delay in obtaining the permit. Except district branches/sub-branches of Red Cross which get the task done through the Central Office in Kathmandu, others have to send a person to Kathmandu for 5 to 7 days every three month. If the validity of any document is expiring in less than three months, permit is issued for that period only. Some organisations also reported that Indian Embassy is demanding guarantee deposit of Rs. 1,00,000 (Indian currency) for entry of ambulance across the Indian border.

6.1.7 Misuse of Facility

There is also a tendency of misuse of ambulance facility for non-health purposes. Ambulances operated by public hospitals and large NGOs are the ones susceptible to

misuse because of free rider and related problems. The vehicle is taken as a public good and individually rationale thing to do with respect to public good is to be a free rider. Although evidence is hard to gather, arguments and counterarguments are made by the organizations about the misuse of ambulance for the personal use by the chief and senior staffs. There have also been cases of ambulances being caught by the army for bringing illegal goods while returning back from India. Some ambulances were also reported carrying ordinary persons, when plying without patient, which caused delays in reaching its station and providing service to the needful persons.

6.1.8 Variation in Charges

The variation in ambulance charges except necessitated by the difference in fuel type, vehicle type (Japanese vs. Indian), road type and topography is not justified. This means that ambulances are charging the users indiscriminately, taking advantage of the situation. This is not desired, as people are being subject to differential charges for the same service. Patients do not have the knowledge of differences in ambulance charges and the pressing need to rush to hospital may not permit them to compare prices of different suppliers and thereby call the cheaper one.

6.1.9 Disposal of Old and Non-Functional Vehicles

Old and non-functional vehicles of branches/sub -branches of Nepal Red Cross Society are difficult to sell because the government tax regulation requires the buyer to pay the custom duty in full as levied on the new vehicle. This means that buyers offer too low price, almost scrap value, to be acceptable to the Society. The disposal of old ambulance of district hospitals is a problem because of complicated procedures involved.

6.2 Suggestions

Suggestions are made at three levels for addressing the issues and problems associated with the management of ambulance and make the ambulance service effective and sustainable. The suggestions are made at the policy and organisation levels, and for the NSM, followed by an outline of an alternative management scheme.

6.2.1 Policy Level

- **Government Role**

At present the government does not seem to be much concerned with regard to ambulance service in its policies and programmes for reforming health care system of the country. One may justify this in the context of privatisation and liberalization in a variety of sectors including the health sector. But does this mean that the government has no role to play for the provision of goods and services as well as the rules and institutions that permit markets to flourish? Is it appropriate leaving the ambulance operation and management to the NGO or Trust initiative and the market forces with

government playing no role at all? Given the structure of the country and the problems of the private and NGO sector, the government has to be a partner, catalyst, and facilitator for economic and social development. With regard to ambulance, the vehicle is levied only 1 percent customs duty as against 100 percent in other vehicles on the ground of social service function of ambulance. Given this heavy customs duty concession, the misuse, and other distortions observed in ambulance operation is certainly a cause for concern. Another cause for concern is the uneven prevalence of ambulances among districts and within a single district. Furthermore the lack of coordination among the ambulance operating organizations in the district, and the consequent unfair competition in areas with large number of ambulances can have deleterious effect on the sustainability of the service. All these concerns can be well addressed only by putting in place a sound, well-designed and efficiently managed systems of regulation. The system of regulations should promote fair competition, maintain uniformity in price, protect users and foster higher quality of service along with a variety of other social and financial objectives. The appropriate government office for designing the regulatory system would be the Department of Health Services of the Ministry of Health. At the district level the responsibility of ensuring that ambulances abide by the regulations and coordination of ambulance services of the district should be entrusted to an "Ambulance Committee" that should be constituted under the leadership of either District Development Committee or District Health Office with members representing DDC, DHO, District Police, District Red Cross Society and other appropriate offices. The major focus of the regulatory mechanisms should be on the following:

i. Ensuring that quality standard are met, that misuse and other abuses do not take place and those requiring ambulance are not denied the services.

ii. Encouragement to operate ambulance service in areas not served or inadequately served by ambulances by providing subsidy for the first two to three year. The subsidy should be for meeting either driver's salary or for fuel. The place of ambulance station and the area of operation should be broadly specified.

iii. Maintaining uniformity in charges while allowing variation by type and fuel of vehicle, road category and ecological region.

iv. Maintenance of a logbook by each ambulance operating organization as per the format issued by the government.

v. Controlling unauthorised pseudo ambulance services solely motivated by profit motive.

vi. Promotion of public-private partnership in areas not served by ambulance.

Regulations can be implemented in a number of ways: by inspecting the vehicles, and by checking the permit, logbook, charge receipt pads, etc.

- **Indian Permit for One-Year Period**

There is hardly any rationale for quarterly system of permit from the Indian embassy, but it has created inconveniencies to the ambulance operating organisations. It is desired that the Nepalese government should talk to the Indian government for permit of one-year duration and also for not requiring any guarantee deposit.

- **Affidavit to the Poor**

Granting concessions in the charges to the poor patients has been a problem because of difficulty in deciding whether the claimant is really poor. Moreover, the case has to be decided by the driver because the poverty condition is stated at the end of the journey. So it is suggested that the concerned VDCs should issue an affidavit of poverty to the poor households living within their boundaries. This affidavit should entitle the holder to certain concessions and facilities in other activities also.

- **Custom Waiver on Old Ambulance Vehicles to the Buyers**

In order to facilitate sales of old ambulance vehicles of government hospitals, Red Cross Society branches/ sub-branches and other organisations at remunerative price, customs waiver should be given to the buyers to more than five year old vehicles and vehicles badly damaged in accidents.

6.2.2 Organisation Level

- **Attention to Various Factors**

Organisations should give meticulous attention to selection of driver and incentive system to the driver, maintenance of vehicle, communication between them and the potential users, account keeping of vehicle income and expenditure and maintenance of logbook. Attention should also be given to mobilization of community participation and local support.

- **Creation of an Ambulance Fund**

Organisations should be required to create an 'Ambulance Fund' of certain minimum amount as a safety net for use in difficult financial situation. Discussions with the organisations facing financial problems suggested that the fund should be in the range of Rs. 5,00,000 to Rs. 10,00,000 excluding the cost of vehicle. The interest earned on this fund should be added to the Fund itself. The concerned organisation or trust should make it mandatory to set aside a certain percentage of income earned by the ambulance to add to this Fund. Possible sources for this fund would be contributions from the VDCs and households of the area, and donations from private businessmen and contractors in the area. Contribution from the VDCs located within the catchments

of the ambulance will help to ensure sustainability of the service. The use of Fund should be strictly restricted to meet the shortfall of income from ambulance to meet the recurrent and repair cost of the vehicle.

6.2.3 Nepal Safer Motherhood Project

- NSMP should consider granting of ambulances to districts, which do not have or are inadequately served by ambulance. Organizations, which have dedicated team of volunteers and initiate fund raising campaign for the Ambulance Fund should be considered for the donation of ambulance. The Project should provide each ambulance with one year's spare parts with future provision conditional upon record keeping of their use, maintenance of vehicle and complete filling of logbook.

- The NSMP should consider conducting a study to assess the effectiveness of bicycle ambulances introduced by ITDG, Nepal, particularly with regard to obstetric cases. Based on the findings of the study, support may be extended to wide scale promotion of bicycle ambulances in the villages of terai districts. A study may also be made on the feasibility of motorbike ambulance with specific focus on providing transportation for obstetric cases.

6.2.4 Alternative Management Model

An alternative system of ambulance management would be pooling of ambulances located within a distance of one hour under a single management and organisational framework. This model will be workable in places like Kathmandu, Biratnagar, Dharan, Butwal and other cities, where a large number of ambulances exist at a closer distance. The organisations will be called associated organisations and they will retain their own identity inscribed in their respective vehicles, but they will be under one umbrella of management. The management responsibility will be entrusted to a committee comprising representatives from each associated organizations and other important offices, such as District Development Committee, District Health Office, District Administration Office and District Police Office, constituted under the Chairmanship of DDC Chairperson. This will be quite fitting with the government policy of decentralization of administrative power and resources to local bodies, empowering them to take responsibility of civic, community and development activities within their jurisdiction. The DDC or the District Health Office may be designated as the Secretariat of the Committee. The Committee will set up management modality and operational rules and regulations, and mobilize resources and maintain Ambulance Fund. The major potential benefits of this management would be:

- Reduction of operating cost
  Uniformity in charges and no unfair competition

- Convenient to the people

- Efficiency in service delivery
- Control of vehicle misuse for non-health purpose
- Improved quality of service
- Effective avenue for public-private partnership

Cost reduction will occur because of reduction in the number of staff and drivers. Instead of each organisation keeping one guard, one telephone receptionist and one or two driver(s) attached to a vehicle, a smaller number of these staff will be sufficient to perform the job. Unlike in the present situation, service charges will be fixed and no ambulance will be in competition with several others for the job. Public will also benefit because they need not try one after another organisation for the service. Service provision will be more efficient, as there will be no personal interest or preference to go to certain places only. Misuse of ambulances for non-health purposes will also be controlled. The quality of ambulance service can be improved by equipping some vehicles with the facilities for the care of critical cases such as, artificial ventilation, facilities for blood transfusion, and provision of a nurse to accompany the patient. The government will also have an effective avenue for support to the promotion of ambulance services.

Operationalisation of this management model requires large land area, construction of certain infrastructure such as, office, vehicle garage, and quarters for the drivers, and other facilities such as, electricity, telephone, water supply, etc in the very beginning. An arrangement could be made between government (Central/Local) and the associated organisations for this scheme in the spirit of public –private partnership with government playing a leading role. The government may choose one of the several forms of public-private partnership for this scheme[10].

[10] Some of these are: Operation and Maintenanace, Turnkey Operations, Lease-Purchase, Lease- Develop-Operate, Build-Transfer-Operate, Build-Own-Operate.

References

CBS (2002) **National Population Census,** Central Bureau of Statistics, 2002, Kathmandu.

Lungu, K. et. al. (2000) **Are Bicycle and Community Transport Plans Effective In Strengthening Obstetric Referral System in Southern Malawi?** Mimeo, Safe Motherhood Project, Blantyre, Malawi.

NESAC (1998) **Nepal Human Development Report**, Nepal South Asia Centre, Kathmandu.

NSMP (2001) **Needs Assessment Report: Dailekh District**, Nepal Safer Motherhood Project, Kathmandu.

UNDP (2002) **Human Development Report**, United Nations Development Programme, New York : Oxford University Press

Annex 1: List of Ambulance Operating Organisations Covered by the Study

S. N.	District		Name of the Organisation
1.	Kathmandu	i.	TU Teaching Hospital
		ii.	Om Nursing Home
		iii.	Jana Swastha Kendra, Ward No. 13
		iv.	Ward No. 7
		v.	Bir Hospital
2.	Morang	i.	Koshi Zonal Hospital, Biratnagar
		ii.	Biratnagar Sub-Municipality, Biratnagar
		iii.	Jay Bajaranga Trust, Biratnagar
		iv.	Red Cross Society, Morang
		v.	Chetensil Ambulance, Biratnagar
		vi.	Abadh Narayan Memorial Clinic, Biratnagar
		vii.	Belbari VDC, Morang
3.	Sunsari	i.	Red Cross, Itahari
		ii.	BPKIHS, Dharan
		iii.	Red Cross, Sunsari
		iv.	Lions Club of Danta Kali, Dharan
4.	Dhankuta	i.	Reukayi
		ii.	Red Cross
5.	Illam	i.	My Valley Savings & Credit Cooperatives
		ii.	Red Cross
6.	Rupandehi	i.	Dharmodaya of Lumbini
		ii.	Red Cross, Bhairawa
		iii.	Ram Pyari Samaj, Bhairawa
		iv.	Siddartha Hospital, Butwal
		v.	Nepal Chemists & Druggists Association, Lumbini Zonal Branch, Butwal
		vi.	AMDA Hospital, Butwal
		vii.	Rotary Club, Butwal
7.	Surkhet	i.	Red Cross
		ii.	Surkhet Hospital
		iii.	Reukayi
		iv.	Ram Medical Hall

Annex 2 : List of Persons Met and Interviewed

TU Teaching Hospital	**Position/ Department/ Section**
Chitra Kumar Gurung	Asst. Campus Chief, Institute of Medicine
Baikuntha Thapaliya	Incharge, Transport Section
Nathu Prasad Banskota	Incharge, Transport Section
Karna Prasad Pant	Ambulance Driver
Shakya Muni Nepal	Ambulance Driver

Om Nursing Home

Dr. Hari Krishna Shrestha	Managing Director
Krishna Pradhan	Administrative Officer

Ward No. 13, Kathmandu Metropolitan

Ved Raj Sharma	Member, Ward and Convenor, Ambulance Committee
Astha Maharjan	Ambulance Driver

Bir Hospital

Dr . Gopal Khanal	Act.Chief, Emergency Department
Bhagat Maharjan	Head Driver, Transport Section.

Ward No.7, Kathmandu Metropolitan

Uddav Badal	Member, Ward and Convenor, Ambulance Committee
Suddha Kr. Dhungel	Member Secretary, Ambulance Committee
Sunil Shahi	Ambulance Driver
Mahendra Shakya	Ambulance Driver
Sushil Sharma	Ambulance Helper

Biratnagar

Medical Superintendent,	Koshi Zonal Hospital, Biratnagar
Ashok Lal Das	Ambulance Driver, Purvanchal Nursing Home
Surya Kumar Shrestha	Ambulance Driver,Chetansil, Biratnagar
Ambulance Driver,	Abadh Narayan Memorial Clinic
Parsuram Koirala	Admnt. officer, Biratnagar Sub- Municipality
Tika	Ambulance Driver, Biratnagar Sub- Municipality
Rameshwor Babu	Chairperson, Jaya Bajarang Trust
Vikham Chand Saral	Member- Secretary, Jaya Bajarang Trust

Nepal Red Cross Society, Morang Branch

Kamal Koirala	Section Officer
Kumar Prasad Niraula	Programme Assistant

Belbari VDC , Morang

Shiva Prasad Baral	Chairperson
Kedar Giri	Secretary

Nepal Red Cross Society, Sunsari Branch

Tom Prasad Acharya	Chairperson
Bishnu Kafle	Minister
Dharma Raj Shrestha	Member

Nepal Red Cross Society, Itahari sub-Branch

Ram Babu	Section officer
Krishna Paudel	Convenor, Ambulance Committee
Ram Prasad Acharya	Office Assistant

BPKIHS, Dharan

Dr. Narayan Kumar	Hospital Director

Lions Club of Dantakali, Dharan

Mrs. Shyama Regmi	Chairperson
Gopal Bamjan	Ambulance Driver

Reukayi, Dhankuta

Harihar Maskey	Chairperson
Krishna Man Pradhan	Office Assistant

Nepal Red Cross Society, Dhankuta Branch

Jib Lall	Chairperson
Bipin Shrestha	Minister and Convenor, Ambulance Sub-Committee
Bishnu Krishna Joshi	Staff

My Valley Savings and Credit Cooperatives, Illam

Purna Bahadur Tamrakar	Chairperson
Dinesh Pradhan	Convenor, Ambulance Committee

Nepal Red Cross Society, Illam Branch

Bed Prakash Dahal	Convenor, Ambulance Sub-Committee
Shiva Prasad Gautam	Member, Ambulance Sub-committee
Rom Prasad Acharya	Member, Ambulance Sub-Committee

Dharmodaya of Lumbini

Kabindra Bajracharya	Manager
Mahendra Man Shrestha	Health Assistant
Dhan Bahadur Chhetri	Ambulance Driver

Red Cross Society, Rupandehi Branch

Sudarsan Nepal	Chairperson
Mahendra Shrestha	Minister
Niranjan Shrestha	Convenor, Ambulance Sub-Committee
Dal Bahadur Gurung	Ambulance Driver

Ram Pyari Samaj Bhairawa

Manoj Bhattachan	General Secretary

Siddartha Hospital , Butwal

Dr. Nanda Prasad Sharma	Medical Superintendent

Nepal Chemists & Druggists Association, Lumbini Zonal Branch

Babu Ram Bhattarai	Chairperson

AMDA, Butwal

Dhurba Shrestha	Administrative officer
Rajesh Basnet	Ambulance Driver

Rotary Club, Butwal

Rajendra Dhakal	Office Secretary
Shyam K.C.	Ambulance Driver

Surkhet Hospital, Surkhet

Dr. Ram Shanker Thakur	Medical Superintendent

Reukayi, Surkhet

Tanka Prasad Acharya	President
Rama Devi	Immediate Past President
Bhim Subedi	Office In-Charge

Nepal Red Cross Society, Surkhet Branch

Dev Prasad Gautam	Minister
Bishnu Bahadur Khadka	Member and Chairman, Ambulance Sub-Committee
Govinda Prasad Acharya	Section Officer
Lila Ram Subedi	Sub-Branch President

Ram Medical Hall, Surkhet

Kagendra Thapa	Proprietor

Bus Owners and Workshops in Surkhet and Nepalgunj

Nara Bahadur Basnet	Bus Owner, Surkhet -Dailekh Route
Narayan	Proprietor, Narayan Workshop, Surkhet
Sakhil KhanSahil Khan	Proprietor and Head Mechanic, Bagmati Workshop, Nepalgunj
Ran Bahadur Hitang	Proprietor, Ganesh Auto Works Udyog, Industrial Estate, Nepalgunj
Binay Kumar Sharma	Manager, National Automotive Works Pvt. Ltd., Industrial Estate, Nepalgunj

Intermediate Technology Development Group, Nepal

Dr. K. B. Rokaya	Country Director
Mahendra Bijukuchhay	Project Officer, Transport
Alok Rajouria	Manager, Planning, Monitoring & Evaluation Unit

Annex 3: List of Nepal Red Cross Society Branches and Sub-Branches Operating Ambulance

S. N.	District/ Place	S. N.	District
1.	Dolakha	26.	Lalitpur
2.	Sindhuplachowk	27.	Bhaktapur
3.	Kavrepalanchowk	28.	Gorkha
4.	Panchthar	29.	Kaski
5.	Illam	30.	Tanhau
6.	Jhapa (3)	31.	Dulegauda Sub-branch, Tanahu
7.	Morang	32.	Lamjung
8.	Sunsari	33.	Baglung
9.	Itahari Sub-branch (3)	34.	Palpa
10.	Dhankuta	35.	Nawalparasi
11.	Sindhuli	36.	Kapilbastu
12.	Udayapur	37.	Rupandehi
13.	Saptari	38.	Argakanchi
14.	Siraha	39.	Gulmi
15.	Sarlahi	40.	Syngja
16.	Mahottari	41.	Parbat
17.	Rautahat	42.	Myagdi
18.	Dhanusa	43.	Dang
19.	Parsa	44.	Banke
20.	Makwanpur	45.	Berdiya
21.	Palung Sub-branch, Makwanpur	46.	Surkhet
22.	Chitwan	47.	Kanchanpur
23.	Gunjnagar Sub-branch, Chitwan	48.	Doti
24.	Jutpani Sub-branch, Chitwan	49.	Dadeldhura
25.	Kathmandu	50.	Achham

Source: Nepal Red Cross Society, Central Office, Tahachal, Kathmandu

Note: Figures in parentheses show number of ambulances of the branch/sub-branch.
Plan to start ambulance in Bara, Kailali and Nuwakot in near future.