Evaluation Report

On
NRCS Blood Transfusion Services

In Kailali, Surkhet and Baglung Districts

Evaluation Conducted for and Report Submitted to

Nepal Safer Motherhood Project
Nepal Red Cross Society

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CHAPTER I

INTRODUCTION AND METHODOLOGY

1.1. Background

Nepal Safer Motherhood Project (NSMP), which aims to contribute towards the national programme of HMG Nepal by improving maternal health is supported by Department for International Development (DFID), United Kingdom. The Project being implemented in three districts of western and far-western Nepal since 1997 has two programme components. First, service provision under which systems to manage services for women of reproductive age are established, which includes improvements to the physical infrastructure of hospitals, equipment and supplies, training of personnel and adequate supply of safe blood. Second, user demand under which awareness of and demand for services are promoted so that women whose health is potentially at risk due to pregnancy related and childbirth causes utilise the health services. The provision of safe blood supply under the first programme component is managed by Nepal Red Cross Blood Transfusion Centres (BTCs) of the respective districts. During the first phase of the Project (January 1998 to June 2000), the BTCs of Kailali, Surkhet and Baglung were supported through grants from NSMP for improving their capacity for provision of safe blood at all times. This review is conducted to evaluate the performance of BTCs of three districts in particular, and provide recommendations to ensure sustainable blood transfusion services.

1.2 Objectives of the Review

The main purposes of the review are twofold. First, it is to evaluate the current management and technical practices and competencies of three BTCs managed by Nepal Red Cross District Chapters of Kailali, Surkhet and Baglung. Second, provide recommendations on an appropriate package of inputs required for strengthening the management capacity of NRCS district chapters to ensure sustainable blood transfusion services with access to emergency transfusion for all clients regardless of their economic condition.

In order to achieve these broader objectives of the review, the output as well as the tasks to be accomplished were developed and agreed upon between NSMP and the consultant team. For detailed terms of reference of the review, please refer to Annex 1. However, the scope of the study expanded significantly during the review process to accommodate the critical areas, particularly national policy issues, which have significant influence on the working procedures and performance of the district level BTCs. This can be found if TOR of the study and this report is compared.

1.3 Methodologies and Approach, and Timeframe of the Review

The Review Team (RT), before initiating the review task, discussed the objectives of the review and the methodologies to be applied with NSMP and Nepal Red Cross Central BTC officials. In order to accomplish the objectives of the review, data and information was collected using both primary as well as secondary sources. The secondary sources consisted of project documents, MOU between NRCS and NSMP and other services records on blood transfusion. The primary sources consisted of participatory observation of blood transfusion services, interview with broad range of persons consisting of policymakers, health service managers and providers, blood donors to blood recipients. While interview was taken with Mayors, DDC Chairmen, and local government body office bearers, detailed discussion was held with Medical Superintendent and other hospital staffs in the districts.

The Review Team, consisting of three members-one independent person, one representative each of NSMP and NRCS Central Blood Transfusion Services used a fully participatory approach. Apart from participatory discussion as mentioned above, the following methodology was adopted:

a) Discussion with NSMP officials,
b) Interview with senior officials of Ministry of Health,
c) Interview with central office bearers of Nepal Red Cross, and central blood transfusion centre officials,
d) Interview with few local government officials of the programme districts,
e) Interview with few blood donors-institutional as well as individuals,
f) Exit interview with few patients receiving blood transfusion in the hospitals,
g) Focus Group Discussion with Nepal Red Cross District Chapter Executive Committee and Blood Transfusion Centre Committee in the programme districts,
h) Focus Group Discussion as well as individual interview with blood bank technicians,
i) Focus Group Discussion with Hospital staffs, consisting of Medical Superintendent, OT staff, emergency staff, matron etc., in the programme districts,
j) Observation of blood bank, its management system and procedures
k) Review of project proposal, progress reports and other field visit reports of NSMP officials
l) Review of circulars by NRCS Central BTC to district BTCs
m) Analysis of blood utilisation record in the hospital and BTCs
n) Review and analysis of financial records and financial statements and records,
o) Review of literature in the blood transfusion services of few other countries, and NRCS blood transfusion service rules.

The draft report was presented to NSMP, senior officials of Ministry of Health, representatives of UNICEF, WHO, GTZ, DFID and other bi-lateral and multi-lateral agencies and Nepal Red Cross, and their comments and suggestions were considered in preparing this final report.

The review was carried out during the period of September- October 2001. The team spent about two weeks observing blood transfusion services, and discussing with various stakeholders, policy makers and programme managers in three programme districts, and about a week discussing with officials of Ministry of Health, NRCS officials and other concerned persons.

1.4 Organisation of the Report

This report is presented in 4 Chapters. Whereas the first chapter starts with the background and methodology of this Review, the second chapter elaborates in detail the observations and findings of the Review Team. Conclusions and recommendations of the Review are summarised in the third chapter, and the fourth chapter concludes the report with summarisation of some lessons learnt.

The report also contains five tables and four annexes.

CHAPTER II

OBSERVATIONS AND FINDINGS

2.1 History of Blood Transfusion Services

In 1616 William Harvey discovered the theory of circulation of blood in the human body. In 1666 Dr. Richard Lower, an English man, succeeded in transfusing the blood of one dog to another. In 1818 Dr. James Blundell, an English obstetrician tried transfusing human blood to a man dying of cancer of the stomach. The blood seemed to revive the patient a little but he died a few days later, which was inevitable any way. After this incident, Dr. Bundell was encouraged to continue human-to-human transfusion. In 1900 Karl Landseiner discovered ABO grouping system for the first time. This was a great achievement in the field of blood transfusion service. In 1931 first Blood bank in the world was opened in Barcelona, Spain. In 1940 Landsteiner and Weiner discovered another important system of blood grouping i.e. Rh system.

In Nepal, in the year 1966 Nepal Red Cross Society set up the first blood transfusion centre in Kathmandu named Laxmi Blood Bank. In the year of establishment 157 units of blood were collected and supplied. Mr. Daya Bir Kansakar was the first blood donor of Nepal. In the year 2000/01 around 60,000 units of blood was collected all over the country.

2.2 Organisation of blood transfusion Services at the Central and District level

Nepal Red Cross, the largest NGO and humanitarian organisation in Nepal is providing comprehensive services relating to blood transfusion services in Nepal. Nepal Red Cross Society, which was mandated as a sole agency to co-ordinate and conduct blood transfusion related services programmes in the country by His Majesty's Government of Nepal in 1991, presently operates 51 blood transfusion service centres in 38 districts of Nepal. The blood transfusion service in Kathmandu which is expected to serve as a central BTC responsible for providing guidelines and monitoring the services of the districts is managed by a Committee headed by Co-ordinator of central health sub-committee of Nepal Red Cross with the representatives of Government and private sector and blood donors association being nominated to the Committee. The representation to the Committee is not on ex-officio basis, but being practised as such by NRCS for several years. Unlike at the Central level, at the district level where the blood banks are operated, NRCS Blood Transfusion Services Rules provide for ex-officio representation to the Management Committee, which includes Medical Superintendent and representative of blood donors. However, the practice has differed from one district to another.

While Kailali and Surkhet BTC Committees has all NRCS members only, Baglung Committee has Committee structure as prescribed by the Rules. In Surkhet, though the Medical Superintendent is a member to the District Chapter Executive Committee, he is not in the BTC Committee.

2.3 National Blood Transfusion Services Standards

Nepal Red Cross has two sets of guidelines in the blood transfusion services, namely Blood Transfusion Services Rules and Standard Operating Procedures. While the former which attempts to elaborate on the donor recruitment, staffing structure, essential requirement of blood technicians and other administrative procedures which are very internal to NRCS, the later called Standard Operating Procedures (SOP) tries to address standard donor motivation, mobile blood collection procedure, storing procedures, and technical standards on prevention of hazards, standard laboratory and blood supply procedures. ***Though the SOP, which has been developed in 1998, has been submitted to Ministry of Health for approval, NRCS has not received any response from the Ministry so far.*** The Ministry has not even reviewed it as confirmed by one of the senior officials. NRCS seems to have given up the efforts to have the SOP reviewed and approved by Ministry of Health. It must, however be mentioned that the SOP does not define many issues relating to quality assurance mechanism and guidelines for lab tests, but also it does not adequately elaborate on the technical standards sought to be included in the SOP. ***Thus, it does not serve as Standard Guidelines for blood transfusion services. Moreover, the SOP has no legitimacy and legal binding for compliance in view of the fact that this is solely developed by NRCS which is not legal enforcing authority for national standards.***

2.4 Collection, Demand and Supply of Blood

2.4.1 Blood Collection and Supply Trend

The first and foremost factor for assessing the performance of BTC is whether there are any deaths due to unavailability of blood and whether it has been able to cater the need of the blood as required by the Hospital. The following table provides a summarised view of blood collected and supplied to the Hospital:

Table 1

Trend of Blood Collection and Supplies

District	**Collection (in units)**			**Total Collection**	**Supplies (in units)**
Kailali	**Mobile Camps**	**Replacement**	**Volunteers**		
2000/01	122	596	296	1014	984
1999/00	118	668	25	811	783
Surkhet					
2000/01	106	249	122	477	412
1999/00	36	74	100	236	210
Baglung					
2000/01	147	144	5	296	279
1999/00	142	110	10	262	224

In all the three districts, reliable data for 1998/99 as per the above format are not available due to paucity of records. Baglung has included blood collection through institutional donors in Baglung Bazaar in the mobile camps. However, while it is apparent that the blood collection and supply has increased dramatically in Surkhet by

100% in a year's time, the collection has increased steadily in Kailali and Baglung districts. ***The reason for significant increase in blood collection and supply in Surkhet is directly attributable to the provision of surgeons and other three doctors in a regular manner.*** Surkhet supplied just 42 units of blood in 1998/99 when there was only one doctor.

2.4.2 Blood Replacement and Supply for Obstetric Care

As evident from Table 1, all the three districts stringently regulate the replacement system of blood supply. All the BTCs, however, in very exceptional cases, supply blood to the patients in emergency needs without replacement. This is particularly important in Surkhet where the patients as far as from Jumla and other neighbouring districts come to the hospital for treatment who are often unaccompanied or accompanied with someone who is not in a position to donate blood. Though some difficulties are faced by patients due to stringent system of blood replacement, there is no record where blood supply was denied, in case of absolute emergency, due to inability to replace. However, we met with the relatives of few people with severe anaemia who required blood but returned without transfusion because they have nobody to replace. When this issue was discussed with NRCS Committee, there was a unanimous view that most of the people want blood without replacement, and without strict replacement compliance, shortage of blood would be encountered.

The supply of blood for obstetric care is increasing in all three districts. ***In view of the fact that records distinguishing blood supply for emergency obstetric care and for other procedures were not maintained before NSMP support, it is not possible to compare the pre-NSMP and post-NSMP support performance.*** The following table provides a trend of blood transfusion for EOC and other purposes of the last two years:

Table 2

Trend of Blood Transfusion for Obstetric Care

District	Total Transfusion (in units)	EOC (in units)	Other purposes (in units)	% of EOC to total transfusion
Kailali				
2000/01	984	399	585	41
1999/00	783	444	339	57
Surkhet				
2000/01	412	194	218	47
1999/00	210	103	107	49
Baglung				
2000/01	279	104	175	37
1999/00	224	175	49	78

Although we tried to examine three year's trend to make it comparable with NSMP's project initiation; it was not possible to compare the data for three years due to paucity of records. From the above table, it is evident that the blood supply for obstetric care accounts for about half in Surkhet and Kailali, which is more than three fourth in Baglung in 1999/00. In Baglung, out of 658 units supplied in the last four years, 417 units has been supplied to the women of reproductive age, which includes for EOC as well.

2.4.3 Demand and Supply of Blood

In order to assess whether any gaps exist between demand and supply of blood, besides verification of hospital and BTC records, we organised in-depth focus group discussion with Hospital staff as well NRCS DC Executive Committees in all districts. ***Here is the summary of findings we consider very interesting and worth mentioning:***

a) In all the districts, while NRCS believed that it was and is still supplying blood as per the requirement, the hospitals felt that NRCS is unable to cope with full demand. Seti Zonal Hospital Medical Superintendent and other staff felt that Kailali BTC is able to cope with about 75% of the demand, which Surkhet hospital considers about 60%.

b) While NRCS felt that it is supplying blood as soon as possible, mostly within an hour of the demand for common blood groups, hospital felt that it takes about 3-4 hours.

It was however, impossible to find out the exact percentage of supply against the demand made by the hospital due to paucity of records. The units of blood required as per hospital requisition form is returned to the patient without recording by the BTC. Though BTC maintains record of blood supplied, it does not do so for blood requisitioned by the Hospital, thus making it impossible to investigate on the mismatch between demand and supply. ***Thus, the report being compiled and provided to NSMP providing monthly break-up of blood requested and supplied during the last three years, which reflects matching supply to requirements does not reflect real picture.***

2.4.4. Emergency Preparedness Practices

Considering that any blood transfusion services programme should be able to provide blood supply of the group, in the quantity and at the time required, we assessed the emergency preparedness practices in all the three districts in the context of the following factors:

a) ***Buffer Stock of Blood***: None of the BTCs have the system of maintenance of buffer stock of blood at the time of absolute emergency, though all the BTCs had some stock at the time of our visit. Surkhet and Baglung reported that they have run out of stock sometimes. Kailali has 21 pints, Baglung has 16 pints of four groups, and Surkhet has 5 pints. It is important to maintain some stock of blood of balanced group at all times.

b) ***Round the Clock Service:*** All the BTCs have ensured the availability of at least one technician at all times, and no patients have returned without blood due to absence of staff. ***Our interview with a few patients admitted in the hospital in all three districts that received blood transfusion was satisfied with the services and its timeliness***.

c) Donors List: Though all the BTCs have maintained the list of persons who have donated blood with address detail, ***none of the BTCs were found to have***

maintained the list of volunteer donors who have committed to donate blood at any time. This is particularly important for rare blood group. One of the last year incident in Baglung warrant special mention; when women admitted in Baglung for emergency obstetric problem needed O –ve blood, the person listed in the 'donors list' demanded Rs 5,000 which the patient was unable to pay. The search started hurriedly for finding right kind of donor, and after test one ANM student was ready to donate. Similarly, many of the relatives and close persons of a patient who developed post-delivery complication required AB –ve blood were assembled for blood grouping during our visit, which after few days and a match was found. Such a problem would not have arisen had the BTC maintained the list of 'committed donors'.

2.5 NRCS, BTC Committees and their Role and Responsibilities

2.5.1 NRCS NHQ, District Chapters and BTC Committees

NRCS, which manages the blood transfusion services, has district chapters in all the 75 districts of the country. The NRCS NHQ, in essence, plays the role of Federation, and each of the District Chapters are autonomous in much as they are free to plan and design a programme and explore donors-both national and international within the framework of NRCS mandate and implement the programme. NRCS NHQ issues directives, manuals and in some cases procedures as a guide for standard working procedures. Accordingly, it has developed 'Blood Transfusion Services Rules 2052 (1995)' which defines some of the aspects of management of blood transfusion services in the Centre as well as in the districts. The District Chapters in the districts take all the policy decisions relating to blood banks, and they have formed 'Blood Bank Committee' to manage the day to day operations and monitor and supervise the performance of the Bank. ***It was interesting to note that the district 'blood bank committees' have not read the Rules, and thus compliance with the standards is not monitored.*** Our assessment and discussion with the Committees revealed that some of the standards are not implemented or implementable, such as staffing structure in the districts.

The Blood Bank Committees as called in the districts have varying structures in terms of its composition, number and representation. The DC Executive Committee which forms the BTC Committee mostly immediately after its election has similar tenure, though it could be dissolved or modified at any time by the DC just like any other sub-committees.

Kailali has members from NRCS Executive Committee only, Surkhet has Exco member and District Officer, and Baglung has committee with the representation of hospital, blood donors and NRCS. While the later structure is able to invite the participation of different sections of the society, which is prerequisite for a programme of such nature, the former structure is confined to NRCS and thus limits the scope of participation of other sections of the society.

2.5.2 Roles, Responsibilities and Effectiveness of the Committees

None of the DCs have provided any terms of reference to the BTC Committees. The BTC Committees are not very clear on their roles and responsibilities, frequency of the meetings, working procedures etc. Thus, the roles and responsibilities are different in

three districts. While, Kailali Committee takes all decisions except the policy decision, in case of Surkhet and Baglung, DC Committee takes day to day decisions. The Surkhet BTC Committee for instance met in October 2000 and than only once during the whole year in September 2001. No meetings of Baglung BTC has been held in last 18 months. Thus, while Kailali BTC Committee is very active, dedicated and efficient, Surkhet and Baglung Committees need to enhance their efficiency and effectiveness. This has affected the motivation and work efficiency of the technicians also. Though Baglung BTC Committee Co-ordinator, who is also the vice-chairman of DC was considered very effective, the committee chaired by him has been dissolved reportedly due to conflicts with the district NRCS leadership, and reformed. However, though the current co-ordinator does not reside in Baglung and thus is unable to provide leadership to the BTC, he still holds the chair.

The TOR of the BTC Committees with well defined roles; authorities and responsibilities need to be developed. Inability to fulfil the expected roles should result into punishment which should include *inter alia* ouster from the Committee. The Committee structure should be broadened in order to include Medical Superintendent, DDC Chair, Mayors, representative of blood donors and others committed to the cause of BTC.

Interestingly, none of the BTC Committees have had any orientation on the blood bank management so far, and skills to manage the Centre have been gained through experience only. ***Their skills-management, communication and technical, though of varying degrees in three districts, are visibly limited***. In the course of discussion, for instance, some of them were using the term 'sales of blood for x amount' meaning testing charges, which is how most general people inappropriately feel. One knows very well that sale of blood is illegal, and NRCS only charges for test to ensure that each individual receives safe blood. This approach is unable to counteract public rumours.

2.6 Collaboration and Co-ordination of NRCS, Hospital and other Stakeholders in the Districts

The success of any blood transfusion services hinges upon effective collaboration and co-ordination of various stakeholders. We tried to assess the co-operation and co-ordination system between three major players of blood transfusion services. First, suppliers of blood- donors- individual and institutional; second, the demand side-hospital and patients; and the third, NRCS who manages and co-ordinates blood transfusion services.

2.6.1 NRCS and the Blood Donors

In all the three districts, NRCS is found to have very effective collaboration arrangements with the blood donors. Apart from individual donors, all the three DCs have been able to secure blood donation from various social organisations, such as Nepal Jaycees, Reuikay, Political Parties and their class organisations, NRCS Junior Red Cross Circles and Sub-chapters and other organisations, such as Nepal Buddhist Association in Baglung. Mobile blood donation camps are also being organised at regular intervals, especially in Surkhet and Kailali. For instance, 112 units of blood were collected from 9 mobile camps in Kailali during the fiscal 2000/01. Similar number of camps were organised in Surkhet which was just 2 in the fiscal 1999/00. Though mobile camps were not organised in Baglung in the last year, no shortage of blood was, however, faced by the hospital.

Baglung also maintains effective collaboration with NRCS Kaski BTC by way of sending the excess blood and securing supply at the time needed for the patients referred from Baglung. No such co-ordination, however, exists between Banke DC and Surkhet DC. ***Thus, while Banke has short supply of blood, Surkhet has expired stock at the same time.***

2.6.2 NRCS and Hospital

Effective co-ordination between NRCS and Hospital is prerequisite for ensuring that the blood is supplied as per the quantity, group and at the time required. We examined the collaboration and co-ordination between the Hospital and NRCS at both policy and workers level. Considering that both formal and informal co-ordination mechanism is critical for sustained institutional collaboration, we not only interviewed and organised discussion with Hospital officials but also with NRCS DC Executive Committee, and cross verified their views on how it is actually operating. The collaboration mechanism differs from DC to DC; for instance, Kailali has developed very good informal co-ordination with Hospital, though this is not up to desired level in Surkhet. Accordingly, though Kailali and Surkhet have no formal co-ordination mechanism at the policy level, Baglung has developed such a framework by way of representation of the Medical Superintendent to the BTC Committee. Lack of effective co-ordination in Surkhet resulted into expiry of 56 units of blood in the last fiscal, which were 26 units in 1998/99. ***While, a number of anaemic women were returned without blood transfusion, large stock remained at BTC and later expired.*** Five units of blood expired in Baglung in the last fiscal due to over collection of a group for which demand was low. No blood expiry is however, noted in Kailali in the last three years.

2.6.3 NRCS and Local Government and other Donors

Blood transfusion services', being the concern of all, demands the assistance and commitment of all the sections of the society, particularly local government. NRCS has not been able to secure the support of local government, particularly DDC and municipality in any of the districts we visited; though Kailali is getting some support. Surkhet and Baglung DDC and Municipalities appear to be indifferent to the activities of BTC, as substantiated during our discussion with Baglung Mayor. While confirming no current assistance and expressing concern over NRCS's apathy of seeking co-operation, in response to our question whether Municipality will consider support for provision of blood to poor without any charge, the Mayor replied in negative. Our effort to meet DDC chair and Mayor did not succeed in Surkhet. Our long discussion with Kailali DDC chair and Dhangadi Mayor about creating fund for poor patients had some positive response, though there is apparent inclination to withhold the decision to approve the fund with them instead of developing criterion for identifying poor patients and providing them support through NRCS. One can easily garner the hidden 'political agenda' behind this inclination though continued efforts by NRCS DC are expected to bring in positive results.

2.7. Human Resources and their Utilisation

2.7.1 Staffing Pattern and Work Hours

In all BTCs, the only human resources working full time are blood technicians. The BTCs has following staffing pattern:

Table 3

Staffing Pattern of BTCs

S.N.	BTC	No. of Staffs
1	Kailali	3
2	Surkhet	2
3	Baglung	3

The BTC staffs comprise blood technicians only, and there are no other managerial and accounting staffs. The technicians perform broad spectrum of functions, besides blood related technical functions, such as motivation of potential blood donors, maintaining records and accounts and other blood bank related administrative tasks. The blood technicians have no orientation on maintenance of accounts and office records, due to which no proper accounts able to provide information for management decision making were found maintained in all the DCs. In all the districts, Kailali very recently, the accounts are being maintained by the District Chapters staff.

Though BTC Committee in Kailali District Chapter monitors the blood bank related progress reports and financial reports, there is no system in other districts to feed BTC Committees with the performance and financial reports at regular intervals.

In case of Kailali with three blood technicians duty hours are arranged in such a way that one person works about eight hours a day, though there is a concern expressed by DC and the BTC Committee that in case of emergency or leave of one person a fourth technician is necessary for ensuring smooth operation of the BTC. We, however, feel that the need of fourth technician is not pressing. ***The work hours of three technicians in Baglung are not allocated in a judicial manner***, where one technician is unjustifiably allocated more than 12 hours. One of the technicians works during 7AM to 11 AM and between 5 PM to 7 PM; the other technician between 11 AM to 5 PM; the third technician working rest of the time. However, during our visit to Baglung, the third technician was called from BTC for indefinite period to work for DC, which resulted into work hours of one technician 10AM to 4 PM, and the other one responsible for rest of the time. The duty hours of two technicians in Surkhet are arranged evenly.

2.7.2 Skills and Competencies of Technicians

Two types of technicians are performing blood transfusion related services in all three districts.

a) Assistant blood technicians-who are trained in central blood transfusion centre for the period of 12 months. Their course of study is designed by CBTS and this includes theory and practice of basic blood banking.

b) lab assistants-who are trained in government approved CTEVT affiliated institutions for the period of 15 months. This includes 3 months on the job training in related field also.

NSMP during the project period has supported the blood technician course to four persons nominated by concerned NRCS District Chapters. Three existing technicians also received refresher course. The minimum academic attainment for qualifying one-year blood technicians' course is School Leaving Certificate (SLC) pass.

The lab assistants were provided 7 days refresher course by CBTS. ***Most of the technicians currently working have received some refresher course once, they are not however, provided refresher course at regular intervals. Though theoretical knowledge of some of the technicians is far below desired level, their practical skills are satisfactory. The theoretical knowledge of two technicians in Baglung who completed one-year course from CBTS in October 1999 and one refresher course recently is very poor.***

We are of the opinion that there are mainly two reasons for inadequate skills of the technicians:

a) No standards or criterion was developed for selection of the person for blood bank technician's training by the NRCS District Chapters, which resulted into nomination of persons lacking desired level of qualification and aptitude,

b) The 12 months' training program does not have scientific curricula allocating the course as per credit hour, teaching methodology etc. It is simply a course outline, and the blood technicians have reported that they did not receive adequate training in theoretical aspects, and were mostly taken to mobile blood camps for practical training. Lack of well-defined curricula has resulted into lack of uniformity of training, and approach and skills of the trainers has correlated impact on the knowledge and skills of the trainees.

Though no blood transfusion related contraindications are reported so far in any of the districts we visited, there are possibilities that NRCS may face legal problems, if some complications arise, due to lack of recognition of blood technician's course by the Government.

2.7.3 Job Satisfaction and Motivation

The blood technicians were normally found to be dedicated to their work. However, the degree of satisfaction, dedication and motivation differs from one BTC to another. The participatory approach involving the blood technicians in the management processes, regular interaction of BTC Committee with the technicians and due recognition of their work have served as non-monetary motivating factors in the Districts. This has resulted into acceptance of more workload and internalisation of long working hours by technicians without much discomfort such as in Kailali. One of the blood technicians in Kailali, who is trained as CMA, assists the hospital staff beyond his working hours in the BTC. This has helped into bringing more co-ordination between hospital and BTC at the staff level.

However, lack of these participatory management processes has discouraged the technicians, for instance in Surkhet and Baglung. Other factors which have created frustration include temporary contractual job of blood technician for continuous three and half years and providing same salary scale to all technicians in spite of different skills and service years in Baglung, reduction of existing take home salary of the technician, by almost 15%, who has been continuously in the job since the establishment of Surkhet BTC in March, 1995. Unequal division of working hours amongst the technicians is considered discrimination and therefore has been a barrier for staff motivation.

There are mainly two aspects associated with retention and motivation of the technicians:

a) the retention of blood technician trained only as such by CBTS is more likely (even with reduced motivation), as they have no other job alternatives. Possibilities of use of their skills in other organisations are remote, as NRCS is the only organisation providing blood transfusion services in Nepal.

b) the retention of other technicians who are trained as CMA and lab technician hinges upon their sustained motivation.

Our participatory and exploratory investigation on the factors contributing to their motivation and retention brings out the following aspects:

a) fear of loss of skills- CMA and lab technician have concerns that their skills may be lost over the years, and therefore NRCS should create an opportunity of using their non-blood bank related skills,
b) enhancement of knowledge and skills through refresher training, participation in the workshops, exchange visits to more advanced facilities and supportive supervision would play a motivating factor,
c) participatory management processes which is able to create 'sense of belongings' and recognition of work emerge as other factors,
d) provision of salaries and allowances as per NRCS structure would contribute towards integration of district BTC programme with that of CBTS. The salary scale of one BTC differs from that of another apparently due to freedom provided by NRCS HQ to fix the salary of staff as per the paying capacity of DCs.

In Dhangadi, there are four private pathologies and DC and blood technician commonly feel that BTC may provide pathological services, which shall also contribute towards financial sustainability of BTC. However, prospects of diversification is although assessed by Baglung and Surkhet BTCs, NRCS Committee and technicians fear of non-co-operation of doctors which is pre-requisite for its success.

2.8 System and Procedure to Ensure Safe Blood Transfusion Services

We reviewed in detail in three programme districts, namely Kailali, Surkhet and Baglung districts the system in place and procedures applied to ensure safe blood supply to the needy persons. We attempted to examine the elements of safe blood supply system, such as donor selection and screening procedure, blood collection and preservation, screening test and kits used, infection prevention practices etc., and our findings are summarised below:

2.8.1 Donor Recruitment

Provision of safe blood service starts from donor recruitment, and therefore its is absolutely critical to have 'good donor'. When a motivated donor comes to blood bank for blood donation, he/she is asked to fill in a donor form and the blood technician screens the donor following the checklist as below:

i) Age: 17-60
ii) Pulse: Normal
iii) Blood pressure: 100-160 mm Hg (Systolic)
70-100 mm Hg (Diastolic)
iv) Haemoglobin: >12.5 gm/dl
v) Temperature: Normal
vi) Interval between donations: 3 months
vii) Weight: > 45 kg
viii) Absence of any chronic diseases
ix) Not pregnant in last 6 months.
x) Last menstruation cycle > 7 days.
xi) Currently not taking any therapeutic measure.

The above checklist appears to be satisfactory.

It was observed that amount of haemoglobin is presumed after looking at eyelid, and any doubt about the haemoglobin level sufficiency will stop the donor from donating. Selection of donor was based on question and answer on health status between technician and donor.

Blood is collected from mainly two types of donors (i) volunteer (ii) replacement. Volunteer donors are mostly institutional donors such as students union, government employees, religious groups, Reyukai, Youth Red Cross, Jaycees etc. For conduction of mobile donation camp interested institutions send a letter of information and request for date regarding mobile blood donation camp. Mostly mobile team is led by senior technician and team number depends upon expected donor number. Motivation programme is mostly conducted for new group of blood donors, and no such system is integrated in the camps.

2.8.2 Blood Collection and Preservation

After screening process is complete, 350 ml of blood is collected in JML blood bag with CPDA solution (J. Mitra company, India). Collected blood is sent for blood grouping, serological screening test and preservation. When demand of blood is requested to the blood bank, the relatives of the patient are asked to bring patient's blood sample for grouping and cross-matching which is regrouped for both patient and donor. However, in Kailali, on duty technician himself goes to ward for collecting blood sample who brings in the sample in syringe without a label. In Surkhet, the relatives of the patient first come to blood bank, with a request of blood demand to check whether appropriate blood is available. In blood bank requisition form is filled up and they are sent back to ward for collection of blood sample for grouping and cross matching. Usually sample is brought in syringe without label. In Baglung also blood sample is sent in syringe itself without labelling.

Replacement is considered mandatory in all the districts, though exceptions are allowed in case of emergency where the patients or his/her relatives are not able to find the suitable blood donors.

In all three districts refrigerators for blood storage were maintained well and provided with thermometer for temperature monitoring. Daily temperature monitoring is done but system of recording on paper is not seen.

2.8.3 Screening tests, Kits used and Supply of Blood

Donors are screened and blood pressure is checked using sphygmomanometer. Medical history is also taken to verify health status of the donor. The collected bloods are first arranged in order and then ABO grouping and Rh typing is done by cutting pilot tube. Only one person does blood grouping and normally front grouping is done; back grouping is seldom done in Kailali and Baglung districts. Front grouping is done using Anti-A, Anti-B and Anti-D and Anti-AB is not used in Kailali and Surkhet. In Baglung, Anti AB is also used. Though in Surkhet, two persons do blood grouping, and both front grouping and back grouping are done. After completion of blood grouping, bloods are proceeded for serological screening tests. In Kailali and Surkhet, three serological screening tests, namely HIV, HBsAg and VDRL are being done. While, Hepatitis C test was introduced as routine screening test in Baglung on 16th July 2001, this is not done in other two districts. Apart from kits supplied by J. Mitra & Co., India, serodia (Japanese kit) is also used for screening HIV in Kailali. Internal quality control of screening tests are done by using positive and negative control provided in kit pack itself and no known human serum samples are used for quality control in Kailali and Baglung. However, purchased kits are

directly used for testing and therefore there is no system of internal quality control of new kits in Surkhet.

In all three districts, cross matching is done using room temperature control, saline and albumin mediums. Normally coombs serum is not used in cross matching. After completion of cross matching, the report is written on blood requisition form. Normally date, B. B. no., compatibility report, date of collection, date of expiry, time of issue and

signature of technician is written on cross-match report. Patient's name is written on supplying blood bag for identification and normally blood bags are handed over to patient relatives'. While in Kailali, blood was seen supplied wrapped in newspaper; it is supplied in polythene bag and wrapped in requisition form in Surkhet and Baglung respectively.

Kailali

- Collected blood is sent for blood grouping, serological screening test and preservation.
- When blood is demanded, on duty technician himself goes to ward for collecting blood sample and brings the sample in syringe itself without label.
- Regrouping of both patient and donor is done.
- Cross matching of donor blood with patient blood is done using room temperature, control, saline and albumin mediums. Normally coombs serum is not used in cross matching.
- Patient's name is written on supplying blood bag for identification.
- Blood is sent through patient relatives wrapped in the newspaper.
- Three serological screening tests are done i.e. HIV, HBsAg, and VDRL.
- Hepatitis C test is not done.
- Serodia is also used for screening HIV (Japanese kit).
- CBTS approved kits are used.
- Positive and Negative control provided in kit pack are used for internal quality control.
- No system referral of positive samples to CBTS for confirmation of positivity.
- Front grouping is done using Anti - A, Anti - B and Anti - D.
- Anti - AB is not used.
- Back grouping is not done.
- Normally only one person does grouping.

Surkhet

- Collection blood is sent for blood grouping, serological screening test and preservation.
- Patient's relatives come to blood bank with a request of blood who go back to ward for collection of blood sample for grouping and cross matching. Usually sample is brought in syringe without label.
- Regrouping of both patient and donor is done.
- Cross matching of donor blood with patient blood is done using room temperature, control, saline and albumin mediums. Normally coombs serum is not used in cross matching.
- Patient's name is written on supplying blood bag for identification.
- Blood is sent through patient's relatives wrapped in polythene bag.
- Three serological screening tests are done i.e. HIV, HBsAg, and VDRL.
- Hepatitis C test is not done.
- All the kits are bought from Nepalgunj Red Cross blood bank.
- CBTS approved kits are used.

- No system of internal quality control of kits. Purchased kits are directly used for testing.
- No system of referral of positive samples to CBTS for confirmation of positivity.
- Front grouping is done using Anti-A, Anti- B and Anti - D.
- Anti - AB is not used.
- Back grouping is done.
- Normally two persons perform grouping.

Baglung

- Collection blood is sent for blood grouping, serological screening test and preservation.
- When blood is demanded, blood sample is sent to blood bank in syringe itself without labelling.
- Regrouping of both patient and donor is done.
- Cross matching of donor blood with patient blood is done using room temperature, control, saline and albumin mediums. Normally coombs serum is not used in cross matching .
- Patient's name is written on supplying blood bag for identification.
- Blood is sent through patient's relatives wrapped in requisition form.
- Four serological screening tests are done i.e. HIV, HBsAg, UDRL, and hepatitis C.
- Positive and Negative controls provided in kit pack are used for internal quality control.
- Positive samples are not sent to CTBS for confirmation.
- Front grouping is done using Anti - A, Anti - B, Anti - D and Anti - AB.
- Back grouping is not done.
- Normally one person performs grouping.

Though Kailali has 3 HIV positive, 22 HBaSg and 2 VDRL cases, and Surkhet and Baglung has 4 and 8 HBaSg cases respectively in the last year, ***none of the BTCs have referred positive samples to Central Blood Transfusion Centre (CBTS) for confirmation of positivity.***

Thus, all three concerned blood banks are using CBTS approved kits though they are bought from different sources. Quick tests are used for screening test in all districts.

Our examination concludes that the procedure of ensuring safe blood is satisfactory. However, system of labelling samples does not exist which is most necessary. Further coombs serum is not regularly used in cross matching, which needs to be regularised.

2.8.4. Infection Prevention and Waste Disposal Practices

Due to the increasing prevalence of Hepatitis B, C, D, and HIV, the focus of infection prevention has shifted towards considering that all clients/patients are potentially infected. It is important to direct attention towards preventing infection of service provider and client/patients. Therefore, the major objectives of the infection prevention practice should be, *inter alia*, prevention of client/patients and service providers from the transmission of the serious diseases such as hepatitis B, hepatitis C and HIV/AIDS.

The situation of three districts we visited in terms of infection prevention practices is observed as follows:

Kailali

- Only one technician is trained among three. The peon working 24 hours in the BTC is not trained
- Technicians usually do not use protective barriers such as waterproof apron, face shields during the procedure. These protective barriers protect the service provider's eyes, nose and mouth from splashed blood
- There is no regular supply of virex and other IP supplies such as utility gloves, apron, puncture proof container etc.
- Support staff do not have knowledge about the preparation and use of virex and about the appropriate techniques of waste disposal.
- BTC Committee is not aware about the importance of IP practices in the blood bank.
- All waste products such as paper glasses, syringes are collected in a plastic bucket and disposed off in the hospital incinerator.

Surkhet

- Both the technicians are not trained in IP. One is newly appointed and senior technician got the opportunity for the training, but due to time constraints, he was not able to participate as he was working alone before the new technician's arrival.
- One support staff who is helping BTC technicians is also not trained.
- All waste products are collected in a plastic bucket and disposed off in the pit.
- Technicians are not aware of protective barrier such as face shields, waterproof apron during the procedure
- Support staff do not use utility gloves while cleaning the contaminated test tube, slides and disposing waste without gloves due to lack of knowledge and supplies.
- No supply of the IP supplies. Senior technician is not interested to improve the IP practices due to lack of motivation and support from the BTC committee

Baglung

- Only one technician is trained, the other two are not; though the trained one by NSMP is not practising the skills effectively
- Support staff are not trained
- There is lack of IP supplies. Red Cross chapters are not supportive for IP supplies due to lack of awareness and knowledge about the IP
- Technicians do not use protective barriers during blood examination procedure
- No regular supply of water in the blood bank; water is collected from the hospital in a plastic bucket

The practices followed for disposal of expired or unusable blood is not proper either. Whereas Surkhet was found burning the blood with the bag, Kailali throws in the drainage. Baglung throws the blood in the toilet, and burns the bag. ***It is necessary to***

disinfect the blood with sodium hypochlorite and dispose in the drainage with large amount of running water.

Thus, in all three BTCs, IP and waste disposal practices are very poor due to lack of awareness and importance of ensuring IP practices. NSMP input would be necessary for better improvement of the IP waste disposal practices in the BTCs.

2.8.5 Bedside practices of providing transfusion to the patients

In all three-district hospitals, only a doctor is responsible to order blood. Though hospitals have developed a standard blood request form to requisition blood from the BTC, it is not always used. According to hospital staff, blood transfusion centres are providing blood effectively though the provision of rare blood such as O –ve, AB-ve is still a big problem in all districts in general and in Baglung in particular.

2.9 Equipment Available in the BTCs and their Adequacy

Though all the three BTCs have essential minimum equipment, some of them are not in working condition. For instance, 2 refrigerators, waterbath and centrifuge in Kailali are not in working condition. Similarly, out of 4 Sphygmomanometers, two are not in working condition in Kailali. Similarly, of the two Sphygmomanometers, one is not in working condition in Surkhet, and one centrifuge is not used at all. The list of equipment being available in all three BTCs and their working condition is appended in Annex 3 a, b, c, and d.

All the three BTCs lack some essential equipment. For instance, none of the BTCs have view box, which is essential for better blood grouping. Surkhet does not have a microscope, Surkhet and Baglung need to have a needle destroyer. ***None of the BTCs have system of regular maintenance of equipment and validation of their functioning.***

2.10 Replenishment of Reagents and Kits

The Central BTC decides on the reagents and kits to be used by the BTCs in the districts. Accordingly, blood bags and kits produced by J. Mitra Company India are approved for use by BTCs. The districts BTCs may procure the reagents and kits from Central BTC or from the producers directly. Both the systems are in place currently. Kailali BTC use to procure the kits from Centre, which has been discontinued due to delay in receipt. Surkhet experienced similar problem, and therefore it started buying from Banke BTC. Due to shortage of funds, in Kailali and Surkhet, the payables to Centre accumulated, which has been cleared now after NSMP, support was received for revolving fund equal to four months' supply. The BTCs further could not maintain buffer stock of reagents and kits due to shortage of funds. Thus, none of the BTCs in three districts have developed any system of maintaining buffer stock, reorder level, reorder quantity based on the consumption pattern and the lead time required for replenishment of stock. Baglung has stock of expired antisera and some other are at the verge of expiry. Similarly, 40 HIV kits expired in Surkhet due to supply in excess of normal demand. ***Thus, care should also be exercised to follow FEFO (first-expiry-first-out) to ensure that the reagents and kits do not go date expired.***

The price of reagents and kits was also found different in the BTCs. Kailali bought anitsera (J. Mitra & Co, India) at Rs 930 per 10 ml, which cost Rs 514 in Surkhet (Tulip Company), both of which are approved. Some consider Tulip even of higher quality. Further, the CBTS rate has differed significantly compared to Districts. CBTS bought antisera of J. Mitra at a price little higher than Rs 500, compared to Kailali's cost of Rs 930.

2.11 Supervision and Monitoring System

The role of central blood transfusion services vis-à-vis the district BTCs, though is not clearly defined anywhere in the NRCS Rules and Regulations, its role is widely perceived as co-ordinator of blood transfusion services in Nepal responsible for setting standards and issuing guidelines. Nepal Red Cross has, in the Blood Transfusion Services Rules 2052, provided some standards for staffing structure, donor motivation etc at the district level, however the technical support to districts has been minimal. ***Though reference is made of 'quality monitoring form' developed by Central BTC in the NSMP inception report and in the TOR of this study, no such system is found developed***. The supervision and monitoring system by CBTS is absolutely lacking as substantiated by the fact that no monitoring visit has been done by CBTS in any of the districts save visit of 'administrative nature' in Baglung during the last three years. It is interesting to note that central BTC has sent no circular or letter to District BTC, except for circular for participation in the training/seminar, in the last three years. ***It is thus testimonial to that fact that district BTCs get no technical assistance or guidelines on new developments from CBTS at regular intervals.***

2.12 Provision of Services to Poor patients

Though all the BTCs have some system in place for the provision of blood supply free of any charge to the poor patients, however, no criterion has been developed for identifying poor patients nor uniformity exists in the districts for provision of such facility. Baglung, for instance, provides supply free of charge on the recommendation of Medical Superintendent who also sits in the BTC Committee. In doing so, the doctor on duty, instead of complying with any standard criterion, makes his own judgement. Kailali, possibly is the most liberal in providing blood bags free of charge to 'poor patients'. Kailali, during the period of July 2000 to August 2001, provided 89 bags free of charge, which accounts for 9% of total blood supply. Out of this, the charges for 61 bags have been reimbursed by Municipality, 2 by DDC and 2 by Netherlands Leprosy fund and rest on NRCS's own account. Accordingly, during the 12 months' period of the last year, Surkhet has distributed 28 bags (25 bags in the earlier year) free of charge which accounts for 7% of blood supplied compared to 12% in the previous year. NRCS Surkhet bears the entire cost of blood bags supplied free of cost by itself. However, no reliable record of supply at free of charge is maintained in Baglung. Further, though the record of blood supplied free of cost exists***; there is no record of how many units were supplied to poor patients who can't afford to pay.***

Since none of the BTCs have developed any standard criterion for identifying poor patients in terms of free supply, it is apparent that the facility is used by even those people who can afford to pay. The Dhangadi Mayor openly confessed that though the purpose of fund allocated by Municipality is to allow absolutely poor patients to get the

benefit; he is providing this facility whoever comes to him. He further adds that being a political person, neither he can deny the request from any person nor he can screen the patients who can't afford to pay.

2.13 Cost of Service Provision

We also attempted to compare the cost of providing one unit of blood in three districts. Despite our long efforts during our visit, and even after a long time of our visit, we were not provided with the bills and invoices of reagents and kits; thus we are unable to determine the cost per unit in Baglung. The table below provides comparative statement of service charge, cost and surplus/deficit on one unit of blood:

Table 4

Comparative Statement of Service Charge, Cost and Surplus Margin

	Central BTC	**Kailali**	**Surkhet**
Service Charge (per unit of blood) in Rs		**505**	**650**
Direct Cost			
Blood Bag	38.00	57.00	60.00
IV Set	20.00	20.00	20.00
Grouping (patient+donor)	10.28	37.20	13.20
Cross Match	3.12	27.30	5.20
HBaSg	41.60	65.00	60.00
HIV Test	100.00	104.43	104.00
VDRL	2.00	10.00	10.00
Disposable Syringe	5.00	5.00	5.00
Total	**220.00**	**325.93**	**277.40**
Salary and Allowances of Technicians (Total Salary spread over no. of blood units)	Not compared	265.40	277.67
Utilities		34.15	39.32
Total Direct Cost (without depreciation on equipment and building)		**625.48**	**594.39**
Surplus/Deficit per blood bag in Rs.		**(120.48)**	**55.61**

The following issues deserve special mention concerning the above analysis:

a) While Kailali did not even recover the full direct cost, Surkhet had a surplus in direct cost of Rs 55.61 per unit.

b) J. Mitra's Antisera cost Rs 930 in Kailali compared to Rs 514 in CBTS. Tulip antisera cost Rs 660 per 10 ml in Surkhet. The consumption pattern shows that 10-ml antisera were used for 50 units of groupings in Kailali against 100 in Surkhet. Thus, less cost as well as efficiency in use has reduced cost per unit in Surkhet.

c) 10 ml bovine albumin which was used for 22 cross matches in Kailali cost Rs 600 against use of 100 cross matches in Surkhet at a cost of Rs 520 per 10 ml. Thus, Surkhet cost per unit proved cheaper compared to Kailali.

d) Difference in price in other kits as evident from Table 4 also resulted into higher or lower cost.

e) The CBTS invites bids every year for purchase of reagents and kits, and therefore price is competitive. However, if the district BTCs procure from centrally approved suppliers in the districts, they generally have to pay retail price. This has resulted into high price of regents and kits for the district BTCs

2.14 Financial Analysis of the BTCs

2.14.1 Operating Income and Expenses Trend

The following table provides an analysis of financial picture of three BTCs over the period of three years covered by this review:

Table 5

Comparative Financial Statement of the BTCs

	Kailali	**Surkhet**	**Baglung**
Year 2000/01	**Rs**	**Rs**	**Rs**
Income from Transfusion Services	**554,554**	**245,634**	**196,826**
Reagents, Kits & other consumables	220,239	123,600	75,079
Salaries & Allowances of the Technicians	293,984	114,400	109,530
Utilities	34,592	16,200	16,120
Other Administrative Expenses	29,260	22,000	14,007
Total Expenses	**578,075**	**276,200**	**214,736**
Operating Loss	**23,521**	**30,566**	**17,910**
Other Non-operating Income	69,549	47,100	125,003
Net Surplus (without depreciation)	**46,028**	**16,534**	**107,093**
Year 1999/2000			
Income from Transfusion Services	**419,810**	**126,750**	**163,060**
Reagents, Kits & other consumables	152,193	76,592	74,099
Salaries & Allowances of the Technicians	180,048	100,100	104,210
Utilities	24,028	14,400	8,300
Other Administrative Expenses	16,265	15,000	3407
Total Expenses	372,534	206,092	190,016
Operating Surplus/Deficit	**47,276**	**(79,342)**	**(26,956)**
Other Non-operating Income	42,680	47,100	**111,458**
Net Surplus/Deficit (without depreciation)	**89,956**	**(32,242)**	**84,502**
Year 1998/99			
Income from Transfusion Services	**293,686**	**92,760**	**61,701**
Reagents, Kits & other consumables	60,596	39,200	32,463
Salaries & Allowances of the Technicians	110,235	56,520	54,858
Utilities	48,597	12,560	7,800
Other Administrative Expenses	240	11,200	12,007
Total Expenses	**219,668**	**119,480**	**107,128**
Operating Surplus/Deficit	**74,018**	**(26,720)**	**(45,427)**
Other Non-operating Income	79,629	37,200	72,712
Net Surplus (without depreciation)	**153,647**	**(10,480)**	**27,285**

From the above table, one can easily gather the following:

a) Baglung BTC is continuously making surplus over the period of last three years. The main reasons are-service charge is Rs 790 per unit, which is considered to be the highest in Nepal and Rs 285 more than Kailali, and Rs 140 more than Surkhet. Further, Baglung earns about Rs 100,000 from house rent it shares at 80:20 with the hospital, which is Rs 47,000 in Surkhet.

b) All the BTCs incur operating loss (except Kailali in 1999/00 and 1998/99), and will continue to be so if part of cost is not covered by other income generating activities. However, if the present service charge were to be continued combined with no increment of expenses, Surkhet would be at break even at 550 units against the current blood supply of 412 units.

2.14.2 Determination of Service Charges

As mentioned in the above paragraphs of this report, the blood transfusion service charges significantly vary in all the three BTCs covered by this study. It is Rs 505 per unit in Kailali, Rs 650 for hospital patients and Rs 725 private patients in Surkhet, and Rs 790 in Baglung. When discussed on the basis of fixation of such rates, all the BTCs have same answer-charges were determined on the basis of charges of neighbouring districts. However, this is not so in practice. ***This clearly suggests that no basis was adopted for determination of charges***. None of the BTC Committees or staff members have any vague idea on the cost of providing one unit of blood apparently due to lack of skills, and cost elements are not monitored in order to evaluate the possibilities of curtailing cost. As already dwelt upon in detail, there are efficiency related costs, which can be significantly reduced particularly in Kailali.

One of the senior officials of NRCS quips that most of the BTCs appear to have profit making objectives in practice, and NRCS NHQ has not been in a position to take policy decision on the pricing issues, and exploring the possibilities of raising local funds to partially fund or share the cost of blood transfusion services programme.

Further the present policy is either to recover the full service charges or fully subsidise. Possibilities of cross subsiding which allows adjusting service charges according to ability to pay are never explored, though implementation may not be easy.

2.15 NSMP Support and its Impact

a) ***Provision of HIV and Hepatitis B Test***: Based on the findings of need assessment mission in 1997, NSMP provided various types of support to the BTCs. The need assessment showed that only one BTC screened the blood for HIV and Hepatitis B, and none of the Centres had system of quick test provision for HIV and Hepatitis B in the event of obstetric emergency. These services have been introduced in all three districts after NSMP provide training, reagents and kits.

b) ***Training of Technicians:*** Shortage of trained technicians coupled with lack of adequate skills of the existing technicians also affected the quality of the services. In order to address these dire needs, NSMP supported one-year blood technician's

course for four technicians, one each in Kailali and Surkhet, and two in Baglung. Further, three technicians were provided refresher training. This has ensured the provision of three technicians in all the BTCs, though one of the technicians in Surkhet has already left to join Banke BTC. Though the objectives of supporting training for new technicians is to understandably fill in the human resources gap thereby ensuring reduction of duty hours from 24 hours to normal 8 hours, the BTCs have not been able to manage and allocate duty hours in a judicial manner, particularly in Baglung. Since, both the technicians trained were women; they find it difficult to work in the evening and night shift.

c) ***Support for essential equipment and testing kits:*** After NSMP's support of essential equipment and testing kits for an estimated period of four months, all the BTCs have strengthened their services and introduced the system of HIV quick test, and Hepatitis B. Further, support for revolving fund for testing kits has not only resulted into clearance of long dues for kits purchased to CBTS, it has also ensured availability of kits at all times. Kailali BTC is well maintaining the revolving fund; it has opened separate account and puts all efforts not to allow the use of the money for any other purpose except for kit purchase. Baglung does not have shortage of resources for day to day operations, Surkhet however, has not maintained any revolving fund as stipulated in the agreement.

d) ***Motivation Training:*** Nine motivators, three in each of the districts have been provided training to enhance their motivational skills. The effect of this training has been excellent in Kailali and Surkhet, it has however, created no impact in Baglung. One of the members of the BTC in Surkhet openly admitted that he did not even think of donating blood due to a hidden fear that it weakens the biological system of the body, which was completely changed after motivational training. He has not only donated blood a couple of times after training, but also motivates others to donate blood. While all the participants were from NRCS or institutional blood donors in Surkhet and Kailali, Baglung nominated the people who are no members or associated with NRCS, who no more reside in Baglung.

e) ***Support for ambulance:*** Baglung ambulance was not in working condition for a long time which has started operating after NSMP's support of Rs 154,230 for repair. However, the ambulance is not used for inter alia, blood bank purposes.

f) ***Support for photocopier:*** Kailali BTC submitted a plan to NSMP for operation of photocopier for income generation purpose. The main objective of this plan was to achieve financial self-reliance of BTC operation, which was continuously incurring deficit over the years. Kailali found, after photocopier operation for income generation about one year, that it was not an appropriate decision. The photocopier required major repair, and was not still properly functioning during our visit. The main reason appears to be lack of proper handling and appropriate maintenance. The warranty period has expired, and even during this period, the photocopier supplier did not provide good service.

g) ***Other supports:*** In terms of software support, the NSMP's continuous efforts have also contributed to improve the collaboration and co-ordination between BTC and the hospital, which really needed improvement. These supports have contributed to ensure the availability of safe blood round the clock.

From the above discussion it is apparent that the support of NSMP has been in core area, particularly those described in para (a) to (d). Without these supports, the BTCs would not have been able to integrate HIV and Hep B test in the absence of trained technicians,

equipment, reagents and kits. Support for revolving fund for ensuring smooth supply of reagents and kits has ensured regular supply. The support for training of technicians has not only ensured availability of trained persons in the districts, but also ensured round the clock service.

2.16 Feasibility of Commencing Blood Transfusion Services in Myagdi

The Consultant team visited Beni Bazaar of Myagdi district to explore the possibility of initiating the much demanded blood transfusion services in Beni. Guided discussion was held with Chairman, Vice-chairman, Secretary, and other office bearers and members of the NRCS DC, and VDC chairman. Discussion was held with hospital staff, patients' flow in Myagdi district hospital and those referred to Pokhara for blood transfusion.

A participatory guided discussion was organised with the NRCS DC Executive Committee with the primary objective of understanding the rationale of initiating BTC, and DC's perspective and perception on what is needed to initiate and manage BTC.

a) Are blood transfusion services required at all in Myagdi ?

All the members felt that yes, and opined that Baglung and Pokhara BTCs can't provide services in case of emergency. However, the members have no reliable information, such as surgical procedures or others requiring blood transfusion, and those referred to other advanced hospitals, to justify that blood bank is needed. Further, although the Hospital has two sanctioned post of Medical Officers, there is no position of surgeon and only one doctor has been on the post on and off during the last two months.

The hospital records of the last year suggest bed occupancy ratio of about 60%, with average 10 monthly deliveries. In the last year, about 20 patients were referred to other hospitals for blood transfusion. Annually, about 35 persons are estimated to require blood transfusion in Beni if such a facility is started. However, estimate has to be made on the basis of severe anaemic case trend requiring blood transfusion, which is possible to extract from hospital records.

b) What type of blood transfusion services is than needed ?

In the absence of any service statistics and lack of knowledge and experience to manage the blood transfusion services, and in view of para (a), issue discussed was whether full-fledged blood bank is required. Though there was consensus opinion on the need of full-fledged bank, the Committee discussed on the possibilities of other options, when feasibility of full-fledged blood bank was questioned by the evaluation team. Of the several options identified, such as collection of blood and storing it in advanced facilities in Pokhara or Baglung, maintaining limited stock in Beni etc, one of the options considered most feasible was beginning with emergency blood transfusion services at this stage, and continue to consider other options as the demand for blood grows.

c) How should the emergency blood transfusion services be managed then ?

Two options were considered and discussed. First, initiate and mange the BTC by NRCS alone, placing it on its own physical facilities, provision of appropriate human resources and equipment and managing fund. Second, establish in conjunction with Hospital and share the resources. The second option was considered most feasible, and strategies required to initiate the second option was discussed.

d) Can hospital and NRCS manage the resources together for setting up EBTS?

The four Hospital Support Committee members who are also in NRCS Committee, and Medical Officer and other hospital staff expressed commitment to initiate and mange together. Hospital is committed to free some space for setting up EBTS (Emergency Blood Transfusion Services), use of equipment and human resources. NRCS has to share the responsibility of other requirements, such as additional equipment, motivating and maintaining the list of donors, training of technician, providing fund and other management support.

NRCS confirmed that it would be able to have donors' list in the range of 20-25, though more than 150 donors are already listed. Equipment, reagents and kits would be supplied from NRCS's resources, either from NHQ or through one time support of the donors, and NRCS is willing to commit resources for training and share the cost of equipment.

The following conclusion emerges in the light of above discussion:

i) It is feasible to initiate EBTS only instead of setting up full-fledged BTC. Experience of NRCS Surkhet Committee who after 5 years concluded that they should have started in a small scale instead of full fledged centre, and experience of 25 bed Tikapur hospital, with catchment area of 27 VDCs of Bardiya and Kailali, of successfully managing EBTS for the last one year justifies setting up EBTS only. Myagdi Hospital and NRCS should work together to jointly establish EBTS, where the blood will be donated to the patients at the time they need by the persons included in the committed donors list. NRCS would recruit the donors; hospital would be equipped with trained human resources, testing equipment, reagents and kits. However, no storage of the blood would be made.

ii) If Hospital and NRCS begin the groundwork, such as maintenance of donors' list, provide refresher training to the existing lab technician, and commit to share the resources, NSMP may consider providing additional support.

iii) Potential NSMP support at the beginning would be-orientation to the Committee members, provide revolving fund for supply of reagents and kits, and matching fund for additional equipment required.

We spent a day discussing with the BTC Committee members and medical officer and other hospital staff in Tikapur PHC which is successfully managing BTC of the nature we have phrased as Emergency Blood Transfusion Services (EBTS) in this report. The

hospital and NRCS share the resources to manage it-NRCS recruits the donor, trained the hospital lab technician in blood technology and pays additional incentive to him for working extra hours. The hospital has integrated this facility with the lab services, which is a cost-effective approach.

In the hospitals, particularly where the patients requiring blood transfusion number less than 100 annually, it is not advisable to open a full-fledged blood bank. EBTS is recommended in such a case. Reagents and kits of small quantity should be used and coordination mechanism should be developed with neighbouring BTCs to ensure cost effectiveness of the services. For instance, if antisera of 5 ml is opened once, it is sufficient for 50 persons. If the blood transfusion is required for 30 persons, such as in Myagdi, antisera would go wasted. This is one of the reasons, among many other elaborated in this report, for co-ordination with other BTCs and hospitals.

CHAPTER III

CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The history of blood transfusion services in Nepal dates back to 1966 to the establishment of first blood transfusion service in Kathmandu called Laxmi Blood Bank. In the year of establishment, 157 units of blood were collected and supplied; the first donor being Daya Bir Singh Kansakar. Since then 51 blood transfusion service centres have been established in 38 districts of the country. This review undertaken during the period of mid-September to mid-October is primarily confined to the performance assessment of three BTCs being operated in Kailali, Surkhet and Baglung districts, and attempts are made to relate to central policies in the context of district performance.

The BTCs, which were established during different times-Kailali (1987), Surkhet (1995), and Baglung (1994) are at different stages of development. Kailali and Surkhet were established as full-fledged blood bank at the beginning, whereas Baglung remained as an emergency blood transfusion centre for about 13 years until 1994, encountering ups and downs over the period. The performance of all the BTCs is satisfactory in terms of provision of blood supply to the needy people, though one is better than another in one aspect and vice versa. The blood collection and supplies in all the three BTCs is showing upward trend in the last three years, Surkhet being top in the list with more than two fold increase in just one year. Their capacity is also different- Kailali which collects and supplies over 1000 units, Surkhet over 400 units and Baglung being the lowest at 296 bags in the current year. Blood supply for emergency obstetric care comprises about half of blood supply in Kailali and Surkhet, which is as high as 78% in Baglung in 1999/2000. Thus, the BTCs are greatly contributing towards the national policy of ensuring safe motherhood.

All the BTCs have distributed some blood free of service charges (Kailali-9%, and Surkhet-7%), but there is no record or any clue on how many of them were poor patients who were unable to pay. Since supply of blood is demand driven and without doctors demand can't be created, the reasons of varying performance are obvious. Kailali is a Zonal hospital with more than 6 doctors working, Surkhet has patients from neighbouring districts and with 4 doctors working from this year, whereas Baglung feels proud with the placement and retention of one doctor at least. However, none of the BTCs have been able to fulfil the demand of blood fully. Though there is no record of blood request, verification of the supply data and discussion with hospital staffs suggest that Baglung meets about 90% of the demand, Kailali about 75 %, and Surkhet a little over 60%. However, there is clearly different perception of supply side-NRCs, and demand side-hospitals, NRCS claiming to have met all the demand, hospital negating the claim. This has in essence resulted from lack of desired level of collaboration and co-ordination between NRCS and the hospital at both workers and policy level. Though Baglung BTC Committee is de facto dormant, because of presence of the medical superintendent in the BTC committee, has resulted into better synchronisation between demand and supply. Further, Kailali BTC Committee is probably the most committed and active among the three covered by this review, but lack of hospital representation in the BTC Committee,

among several reasons though, has resulted into significant mismatch between blood demand and supplies. But all the NRCS district chapters have potentialities to enhance the collection through mobile camps and promoting institutional donors; significant improvement though, is warranted for strengthening system to provide rare group blood and emergency services. Efforts are also called for to counteract the rumours that blood is sold by NRCS. All the BTCs though have the list of persons who have donated blood, none have maintained 'donors' list' encompassing all blood groups which has posed difficulties to supply blood during emergency services.

In the absence of any 'test protocols', the BTCs have followed different system. Screening tests are not uniform in the districts; Baglung screens blood for Hepatitis C tests also, the other two do not. For instance, while one uses Anti- AB for blood grouping other two do not. Coombs serum is not regularly used in cross matching. Infection prevention practices and waste disposal system is still to be internalised by the BTCs. Significant improvements are noted after NSMP support which ensured the provision of three technicians each in all the districts, availability of reagents and kits due to introduction of revolving fund scheme, and increased co-ordination between hospitals and BTCs. However, the procurement of reagents and kits is still done on ad-hoc basis; the BTCs do not have the system of buffer stock, reorder level and reorder quantity resulting to significant date expiry and stock outs sometimes. Though all the BTCs are using the reagents and kits approved by CBTS, the price has varied significantly in three districts due to procurement from different system. Procurement from centrally approved suppliers directly by the district has caused higher price due to retail rates, a critical area warranting attention of the NRCS NHQ.

The service charges also vary significantly in the districts, Baglung charging the highest at Rs 790 considered highest in the country, Surkhet (Rs 650) and Kailali (Rs 505) following. All the BTCs have incurred operating deficit, and other incomes mainly house rent has been used to meet the deficit. Thus, none of the BTCs are in financial crisis so far as day to day operations are concerned, though support is required for additional equipment, improving physical facilities, enhancing management and technical skills, organising motivational camps and finally ensuring the financial sustainability of the BTCs. The determination of service charges is not based on any standards, but every one is apparently guided by 'no loss' attitude, though 'profit motive' is not directly visible.

The role of CBTS as a technical assistance provider has been minimal. No circulars, technical instructions or supervision visits to the districts are made by CBTS in the last three years, thus quality monitoring is almost non-existent. Lack of national standards and guidelines in blood transfusion services is invariably a critical factor for quality services. Due to these reasons, we have attempted to develop fundamental elements for opening a new BTC, which are elaborated in Annex 4. The quality of the blood technicians is far from satisfactory in Baglung particularly. The effectiveness of 12 months' blood technicians' training provided by CBTS is questionable.

Despite these limitations, the BTCs are providing very good services to the needy people, and there is tremendous scope of improvement. Blood transfusion services is mistakenly considered as the sole responsibility of NRCS, which has been a hindering factor for overall effectiveness of blood transfusion services in the country. The government' support has been minimal, limited to a financial grant of Rs 100,000 per annum, and it

has not taken any initiative to develop national guidelines for blood transfusion services in the country. Though buy and sale of blood has generally stopped, law prohibiting the sale requires to be enacted.

3.2 Recommendations

The recommendations of this review are already elaborated in the different paragraphs of Chapter II and IV, however main of them are reproduced here for quick reference.

3.2.1. HMG Ministry of Health should develop national standards on blood transfusion services with utmost urgency. A technical committee should immediately be formed consisting of representatives of Ministry of Health, Central Laboratory, WHO, NRCS and other experts with specific responsibility of doing so within a definite timeframe.

3.2.2 A national Steering Committee should be formed with utmost urgency with the representation of Ministry of Health (preferably head of Policy, Planning, Monitoring and Foreign Aid Division and Director General), Director of Central Blood Transfusion Centre (CBTS), NRCS Secretary General or any other office bearer such as Central Co-ordinator of Health Sub-Committee and other experts MoH deems appropriate. The main responsibilities of this Steering Committee would be monitoring the implementation of the national standards and procedures, and recommending the Government on new policies and guidelines, and developing and approving training curricula of the technicians' etc.

3.2.3 The management structure of CBTS, which is being currently managed by NRCS alone, should be converted into national semi-autonomous body so as to develop this into sustainable and effective services. MoH and NRCS should share the risk, cost and resources together instead of entirely leaving this activity to NRCS. A joint workshop should be organised to explore, discuss and agree on the future modalities of co-operation throughout the country. However, it need not be overemphasised that NRCS's role is critical for motivation, counselling and donor recruitment.

3.2.4 At the district based BTC level, the present committee structure should be enlarged to include Hospital Superintendent, representative institute of the blood donors, DDC and municipality instead of currently confining the membership to NRCS members only. This will help not only to improve collaboration with the hospital, but also increase the participation of local government in sharing resources of the BTC. Representation of NRCS District Chairman to the Hospital Board/Support Committee would also contribute towards strengthening collaboration and co-ordination at the management level.

3.2.5 The TOR of the District BTCs committee should be well defined. The Committee should be provided with full authority and responsibilities to take decisions on day to day affairs of the BTC instead of NRCS DC Committee retaining all the authorities.

3.2.6 The CBTS should develop standard 'test protocol' to be uniformly applied throughout the country, and issue standards and guidelines-such as physical environment, cleanliness, infection prevention, waste disposal etc which are to be complied with by all BTCs.

3.2.7 The CBTS should develop a list of reagents and kits that are to be used by all BTCs throughout the country, which would be reviewed annually. No use beyond this list would be granted without the permission of CBTS. Accordingly, a list of essential minimum equipment should also be prepared, and monitored against the actual existence.

3.2.8 Procurement of reagents and kits should be advised by a technical committee who shall include WHO representatives also to ensure that they meet WHO standards. The CBTS should facilitate the forecast of consumption of reagents and kits in the ensuing year for all BTCs in the country and procure them through competitive bids. The CBTS should supply the goods to district BTCs as per the calendar agreed. The district BTCs, if are allowed to procure goods, would not only pay high cost as they are now but may not be acceptable in quality grounds. For instance, 4 blood bags were found defective in Surkhet in the last year.

3.2.9 The CBTS should provide supportive supervision to all BTCs and provide all types of assistance concerning technical and management aspects. Each of the BTCs should be visited at least once a year, any problems tried to be solved at the spot.

3.2.10 The NRCS NHQ need to clarify very clearly on the objectives of managing BTCs and pricing philosophies. CBTS should thus, develop pricing policies keeping in mind the service motive instead of providing full liberty to determine the service charges of blood transfusion services to individual BTCs in view of the fact that the inefficiency related costs should in no way be shouldered by the people. It does not however, mean that CBTS should specifically prescribe the charge.

3.2.11 CBTS should develop and issue standards-physical facilities, location, equipment, donors list, blood collection and preservation for opening of new BTCs of different nature-for instance, EBTS or full fledged or that has to be maintained by the existing BTCs. The physical facilities in three districts are completely different-Baglung and Kailali have more spacious than Surkhet-which is basically operating in two small rooms.

3.2.12 The current 12 months' blood technician's training course is not only inappropriately designed, but also not approved by the Government. The blood technicians lack legal immunity in the event of some complications. Thus, this type of training should be stopped and all blood technicians gradually replaced by lab technicians who have further training in blood technology. The current blood technicians employed by NRCS should, as far as possible provided an opportunity for lab assistants' training.

3.2.13 There are conflicts, more acute in Surkhet and Baglung on the ownership and use of buildings where BTCs are placed. The buildings have been constructed by NRCS on the land provided by Hospital, which demands a portion of rental. Conflict continues, and therefore NRCS NHQ and MoH should enter into agreement allowing to use the building for BTC purposes permanently. Alternatively, the ownership should be transferred to NRCS.

The following are particularly recommended for implementation in Kailali, Surkhet and Baglung. However, they may be equally valid for other district based BTCs too.

3.2.14 The BTCs should not only develop the list of persons who have donated the blood, but also list of 'committed donors' willing to donate blood at any time. List of blood donors of the rare group should also be maintained, which is absolutely lacking in Surkhet and Baglung. This is particularly important during emergency hours.

3.2.15 Sustained efforts are required to counteract the widespread rumours that NRCS sells the blood. NRCS office bearers and volunteers should be provided orientation to enhance their motivational and communication skills to counsel the potential persons to donate blood as well improve communication skills to disseminate the message that the charges are the cost for ensuring that safe blood is transfused to each and every individual.

3.2.16 NRCS Sub-chapters and other institutional networks, CBOs, NGOs, class organisations of the political parties and civil societies should be mobilised to increase institutional donor base as well as organise mobile camps to meet the demand of blood. However, care should be taken to ensure that significant mismatch does not exist due to over collection of a particular group of blood, which is one of the reasons, though not the main, of blood expiry.

3.2.17 Awareness of the BTC Committee and technicians should be increased to maintain clean physical facilities and environmental hygiene, and infection prevention and waste disposal practices. For instance, Kailali's store keeping need to be improved, blood testing room of Baglung need to be clean and Surkhet should avoid throwing disposable here and there.

3.2.18 Pending the issue of standard testing protocols, laboratory guidelines and other quality assurance mechanisms, the BTCs should make immediate changes in the procedures of blood screening. For instance, regular uses of coombs serum in cross matching and shift to ELISA method for better quality. All the BTCs should use same reagents and follow uniform screening procedures. Surkhet and Kailali need to introduce HCV test, and there is a need in all three districts to develop internal quality control system for every batch of new kits by both methods i.e. positive & negative controls provided in kit pack, and using known human serum samples. Records of daily temperature monitoring of refrigerators need to be maintained.

3.2.19 Despite CBTS system, none of the three BTCs were found to have sent the HIV+ve and Hepatitis B results to CBTS for confirmation clearly due to lack of communication to this effect. The CBTS should issue clear-cut guidelines, and BTCs should begin doing so.

3.2.20 The BTCs lack some critical equipment. For instance, all the BTCs need view box for better grouping. Baglung and Surkhet need to be supplied with needle destroyer and Surkhet with microscope. All the BTCs have many equipment which are not in working condition for a long time (List appended in Annex 3), which require repair. A system of validation of functioning of the equipment should also be introduced.

3.2.21 The technicians should be provided training on quality assurance and counselling, both pre-test and post test to HIV infected people. A system should be developed for provision of refresher training after every two years.

3.2.22 Equipment should be maintained properly. A maintenance fund should be created to ensure that no equipment remain in non-working condition for lack of repair due to paucity of funds. Similarly, revolving fund should be created for reagents and kits for ensuring smooth supply at all times.

3.2.23 All the BTCs should develop the system of maintaining buffer stock of reagents and kits. Based on the consumption pattern, estimated forecast and lead time, reorder level and quantity should be decided.

3.2.24 Co-ordination with other BTCs is required in Surkhet to supply extra blood collected sometimes to other needy BTCs particularly Banke. Baglung and Kailali have already developed this system.

3.2.25 Collaboration and co-ordination is required through formal as well as informal structures between hospitals and BTCs. While formal co-ordination need to be improved in Kailali at the management level, informal mechanism need to be established to improve co-ordination in Baglung. However, both formal and informal collaboration is required in Surkhet at both management and workers' level. This should include regular meetings, sharing reports and taking joint decisions.

3.2.26 The record keeping system in all BTCs need to be improved, particularly in Surkhet and Baglung. The record keeping should include, *inter alia*, blood requested and supplied, purpose, free distribution to the poor patients, group of blood supplied and expired and above all update of accounting and inventory records at all times.

3.2.27 The BTC Committee need to be provided orientation on overall management of the BTCs which none of the Committees have ever received.

3.2.28 NRCS NHQ should as far as possible, attempt to bring in uniformity in the salary and allowances of the technicians. Less monetary benefits compared to the CBTS, such as hazard allowances, OT and even less salary scales in Baglung and Surkhet, coupled with long working hours has caused general demotivation. Care should be exercised to ensure judicial distribution of working hours, and avoid nepotism and favouritism. The technicians need to be recognised for their work. Utilisation of skills of technicians, particularly lab technicians within the NRCS system would not only increase resources of NRCS, but also increase the chance of staff retention.

3.2.29 Ad-hoc supply of blood free of any charge, as is being done currently, should be discouraged. Poor patients' fund should be created for providing blood free of any charge. A standard criterion should be developed for provision of such facility to the poor, which shall include recommendation of the attending doctor. Criterion should also be developed for screening of the poor patients so that those who can afford to pay do not misuse this benefit. DDC, Municipalities and other agencies should be encouraged to contribute to this fund to be managed by NRCS for administration of which transparent policies and procedures would be developed. Any contributory of course will receive all the required reports.

3.2.30 Our recommendations concerning minimum standards and essential elements including the equipment required for opening new BTCs are appended in Annex 4.

CHAPTER IV

SOME LESSONS LEARNT AND BEST PRACTICES

The three BTCs in Kailali, Surkhet and Baglung have been established at different points of time and due to different circumstantial reasons. Kailali was established in 1987, Surkhet in 1995 and Baglung started blood transfusion in the corner of the hospital in 1981 in the wake of devastating flood, and established full-fledged blood bank in 1994 only. These Centres have gained different experiences though many of them are common, and they are summarised here, so that these lessons are considered before setting up the services in the future.

4.1 Think Big Act from Small

Surkhet and Baglung started in different way, the former with full-fledged blood bank, and the later with emergency transfusion service in the corner of the hospital. While Surkhet repents its decision, Baglung considered that it has taken a right decision. Surkhet due to constant management and financial problems even considered closure at some point of time, though it survived difficult days. The present situation reflects that Surkhet's performance has improved tremendously though external binding factors from supply side have contributed more than internal factors.

4.2 Develop a Long-term Plan

Though services may be started in the form of 'emergency transfusion services' a long-term plan should be prepared for institutionalisation of blood transfusion services which ensures the provision of 24 hour safe blood supply to the needy persons. The long-term plan should include, *inter alia*, physical infrastructure, system of supply of equipment, donor recruitment and above all financial resources to sustain the activities of the Centre.

4.3 Community Mobilisation and Networking

Since the blood transfusion services can't be the concern of a particular section of the society, community mobilisation and networking is most to not only ensure donation of blood at a time required, but also for sharing the resources required for managing the Centre. Networking with the CBOs, NGOs and other civil societies is critical.

4.4 Institutional Blood Donors

Over-dependence on replacement and individual donors may not ensure provision of sufficient blood supply, and therefore it is important to develop the base of institutional donors. However, special mechanism is required for supply of rare group blood in the event of emergency.

4.5 Non-partisan Leadership and Committee

Though NRCS DC leadership inclined to a particular political belief may result into short-term benefit depending on the political leadership of the local government, it always pays in the long run to isolate NRCS from a particular political belief. This alone guarantees the free participation in the BTC programme by all sections of the society.

4.6 Co-ordination and Networking with Local Government and Hospital

Co-ordination with local government is critical for securing support-programmatic or financial particularly for marginalised and deprived sections of the society. Without proper co-ordination with the hospital, the programme would be unable to provide services to the needy people in an effective manner.

4.7 Advocacy and Lobbying

Without the provision of doctor, the demand for blood transfusion services can't be created as experienced in Surkhet and Baglung. The NRCS should also strengthen lobbying and advocacy with the Government to ensure placement and retention of doctor in the hospital.

4.8 Local Technicians

While selecting the technicians for training and recruitment, priority should be given to the local people. Experience has shown that while outsiders have left, local technicians remain even after 5 years.

The above is not an exhaustive list, but illustrative only.

Annex 1

Terms of reference
Evaluation of 3 District Red Cross Chapter's Blood Transfusion Services

1. Background

The DFID- supported Nepal Safer Motherhood Project (NSMP) aims to support HMGN National Safe Motherhood Programme (SMP) by contributing to improved maternal health in selected districts. The project has two components: **service provision** under which systems to manage services for women of reproductive age will be established - including improvements to the physical infrastructure of hospitals, equipment and supplies, training of personnel and adequate supply of safe blood and **user demand** under which awareness of, and demand for, services will be promoted so that women whose health may be at risk as a result of causes related to pregnancy and childbirth utilise services.

2. Specific Background

The District Chapter of Nepal Red Cross Society (NRC) manages the Blood Transfusion Centres (BTC) at district level. The Kathmandu based Central Blood Transfusion Centre is responsible to monitor and manage the quality control system.

A needs assessment carried out in 1997 by NSMP in the three selected districts of phase I showed that only one of three services screened the blood for HIV and Hepatitis B and none of the services had "quick test" provision for HIV and Hepatitis B in the event of an obstetric emergency. It was also identified that due to a lack of technicians 24 hours availability of blood was not ensured and there was big communication gap between the services and the hospitals staff.

During Phase I (Jan 1998 – Jun 2000) the BTCs of Surkhet, Kailali and Baglung were supported through grants from NSMP. The following are the general support provided to all three sites:

2.1. Three technicians undertook refresher course
2.2. Four new technicians undertook one year course
2.3. Provided essential equipment and testing kits that includes HIV, hepatitis and VDRL (including quick tests for emergency) to cover a four month period
2.4. Nine motivators have been trained
2.5. Provided financial assistance to organise motivation campaigns to increase volunteer donors
2.6. Support to on-site supervision from the central BTC (which included technical & management support as well as quality assurance monitoring) – NSMP paid supervision cost
2.7. Support to explore how to raise funds (revolve) to maintain the supplies of testing kits after four months supplies ceased

Apart from these inputs other district specific inputs were:

2.8. Provided financial assistance to Baglung Chapter for Ambulance repair; Surkhet Chapter for laboratory improvement and Kailali Chapter to purchase a photocopier for income generating purposes

The support provided were in order to ensure that safe and adequate supplies of blood are available 24 hours, to ensure that the services are sustainable (especially supply of blood free of charges to needy women and the retention of technicians) to ensure maintenance of recurring costs and to enhance relations with the hospital staff.

After 2½ years NSMP believed that the Central BTC was behind in their follow-up supervision to the districts. NSMP then outlined (inter office memo of 12 Oct 1999 written by the then Project Director to Contracts Manager) some of the issues that needed to be clarified and/or to be reviewed. The major areas were as follows (details are attached as annex – 1 to TOR).

2.9. **Management related issues**

Supply system of kits; management of revolving fund; use of provided equipment & its effect on services; system for supplying blood rapidly, free of charge to needy women in emergency, communication between hospital & district level NRC and BTC, balancing supply & demand, provision for extra blood, employment, retention and training of technician,

2.10. **Quality Control**

Minimum tests prior to transfusion, quick tests in emergency, measuring the quality against standards set for the districts, infection prevention practices and waste disposal system, central supervision and support to maintain the quality, emergency service/walking blood bank for PHCs

In this regard a meeting was held on 1 November 1999 at central BTC to discuss the issues. The meeting decided to provide inputs to strengthen the capacity of the local NRC chapters and BTC staff to manage the blood transfusion services. The meeting ended with agreement on an idea of a joint working group between NSMP and Central BTC person that the NSMP identified. On that ground, following the meeting NSMP developed a TOR (Annex – 2 of the TOR) and started working. Some exercises (questionnaire developed and sent to the districts) were done by the team but due to the time constrains of project staff as well as Central BTC staff, the work did not progress well (poor response from districts and no one tried hard to get replies back).

In September 2000, NSMP undertook an extensive needs assessment in six new districts where strengthening and/or establishing BTCs will be addressed in some districts as part of NSMP's package of support. The project input for safe blood supply may improve as a result of supports in training, supplies and equipment but the managerial problems/issues could remain the same as in Phase I districts unless Phase I learning is addressed.

In 2000 UNICEF's Woman's Right to Life and Health Project commenced and is also intending to support blood transfusion service. Therefore, the project wishes to commission an evaluation of the effects of the support to BTCs in the phase I districts and assess the technical & management competence of these local chapters. The finding shall inform the design of NSMP's support to the BTCs in some Phase II districts and shall assist UNICEF in its planning.

3. Purpose

3.1. To evaluate the current management and technical practices and competences of the three BTCs managed by District Chapters of NRC in Kailali, Surkhet and Baglung districts and identify best practises.

3.2. To provide recommendations on an appropriate package of inputs required to strengthen management capacity of district chapters of the NRC, to guarantee a sustainable blood transfusion service with access to emergency transfusions for all clients regardless of their economic condition.

4. **Tasks:** The team will be:

4.1. Briefed by the HRD Manager and the Service Support Manager on the requirements of NSMP and agreed on how to take forward the activities.

4.2. Undertake an assessment process in the three districts (Baglung, Surkhet and Kailali) in a participatory and appreciative manner (appreciative inquiry approach). This will include developing tools to:\

4.2.1. Review existing management structures and practices

4.2.2. Review processes in place to ensure safe blood transfusion practices:-

- quality of screening tests and their usage
- blood collection and preservation,
- infection prevention practices and waste disposal practices
- "bedside" practices of proving the transfusions to the client

Use the quality monitoring form used by Central BTC, Kathmandu.

4.2.3. Review of existing communication practices between NRC District Chapter, Blood Transfusion Centres at both district and central level and the district hospital

4.2.4. Review of current practices for emergency preparedness

4.2.5. Review of current systems or exemption practices for poor patients – especially for women in obstetric danger

4.2.6. Review of recurring cost management systems in place

4.2.7. Review trends of blood utilisation since 1997

4.3. Explore the feasibility of managing an emergency blood bank at Harichaur PHCC of Baglung, Tikapur PHCC of Kailali and the hospitals of Myagdi & Parbat

4.4. Presentation of the findings and recommendations to the NSMP and relevant key stakeholders (NRC district Chapter/BTC, Hospital, central level NRC/BTC, MoH/DoHS etc.)

5. Consultant Team

The team leader is ultimately responsible for managing the team, appointing responsibilities, report production and for presenting the findings. The team leader will have managerial expertise with good facilitation skills to explore possibilities in an appreciative manner for improvements, to articulate and disseminate the findings among individuals, small groups and the entire organisations. Familiar with blood bank management will be an asset.

The Team Leader will manage one senior blood transfusion technician seconded by the Central Blood Bank - duly qualified & competent enough to review the quality of blood transfusion (ensuring that all the required tests are in place and doing properly).

NSMP second one of its Human Resource Development Officers to the team. The HRD Officer will be familiar with district level transfusion services.

6. Outputs

The output of the consultancy will be as follows:\

6.1. A report

6.1.1. The consultant will submit a draft report on findings within two weeks of the assessment completed. This will include:

6.1.1.1 Recommendations on management practices. This shall include recommendations on peer monitoring process, addressing recurrent costs, emergency preparedness, poor patient funds and improved communication systems.

6.1.1.2 Recommendations on an appropriate package of support that NRC blood transfusion centres (via such agencies as NSMP) should provide The package will detail the inputs that needs to be delivered to strengthen management capacity of district chapters of NRC, ultimately aiming to ensure sustainable blood transfusion service with access to emergency transfusion for all clients regardless of economic condition. The programme should have well defined objectives and expected outcomes, should include agreement on responsibilities the NRC/BTC staff, hospital staff and central NRC/BTC. It should detail agreement on local standards for BTC running.

6.1.1.3 Recommendations to improve the technical competency and standards of the blood transfusion service from point of donation straight through to delivery of blood.

6.1.2. The draft will then be discussed with the consultant and the relevant stakeholders (NRC & BTC at both district and central level) if necessary.

6.1.3. Final report will then be submitted within a week after receiving NSMP feedback.

6.2. Presentation

The consultant will present the findings to HMGN, Red Cross and other interested agencies

7. NSMP inputs

7.1. NSMP will co-ordinate with central blood bank, local chapters and hospitals for meetings, if necessary or to set the dates with them and the consultant.

7.2. NSMP will pay the consultant his professional fee and other direct expenses that might incur during the assessment (not the secretarial works) in accordance with the schedule of payment as stated in section five of this contract. The fee shall cover the accommodation and food cost.

7.3. NSMP will manage and pay the cost of team member seconded from central blood bank.

7.4. NSMP will manage the travel arrangements for the team.

7.5. NSMP will organise a meeting for presentation

8. Time Frame

From 10 September to 10 November 2001 – maximum of 40 working days

	Kathmandu	**Kailali**	**Surkhet**	**Baglung**
Meeting	10 Sep 2001			
Field visits		15 – 18 Sep 2001	19 – 22 Sep 2001	27 – 30 sep 2001
Draft Report	08 – 12 Oct 2001			

Production				
Debriefing of findings	19 Oct 2001			
Final Report Production	First week of November (2 days)			
Presentation	09 November 2001			

Annex 2

People met

Kathmandu

1. Dr. L.R. Pathak, Director Family Health Division, DoHS
2. Dr. Benu B. Karki, Director, Policy Planning, Monitoring and Foreign Aid Division, Ministry of Health
3. Dr. Govinda Ojha, Director, Kanti Hospital
4. Mr. Arjun B. Singh, Senior Public Health Officer, Policy Planning, Monitoring and Foreign Aid Division, Ministry of Health
5. Ms Susan Clapham, Project Director, NSMP
6. Mr. Dev Ratna Dhakhwa, Secretary General, NRCS
7. Mr. Tirtha Raj Onta, Executive Director, NRCS
8. Mr. Shiva Shrestha, Co-ordinator, Central Health Committee, NRCS
9. Mr. Rishi Khanal, Senior Administrative officer, Central BTC, NRCS
10. Dr. Manita Rajkarnikar, Medical officer, Central BTC, NRCS
11. Dr. Indira Basnet, Human Resources Development Manager, NSMP
12. Mr. Gopal Kafle, Service Support Manager, NSMP

Kailali

1. Mr. Hem Raj Ojha, Chairperson, Nepal Red Cross District Chapter Kailali
2. Mr. Ramesh Poudel, Co-ordinator, Kailali, BTC
3. NRCS Kailali District Chapter office bearers and members
4. Three BTC technicians
5. Dr. K.K. Rai, Medical Superintendent, Seti Zonal Hospital, and other hospital staff, Matron, OT incharge, Incharge of emergency services etc.
6. Mr. Krishna Gopal Sinha, Act. DPHO
7. Mr. Narayan Datta Mishra, Chairman, District Development Committee
8. Mr. Khem Raj Pandey, Mayor, Dhangadi Municipality
9. Dr. Awasthi, Medical officer, Tikapur Hospital
10. Mr. Uttam Joshi, Co-ordinator NRCS Sub-chapter, Tikapur
11. Mr. Kirti Bahadur Chand, NRCS Co-ordinator Emergency BTC, Tikapur
12. Mr. Dilli P. Pant, Lab Technician/Blood Bank Technician, Tikapur Hospital

Surkhet

1. Mr. Bhavani S. Dhakal, Chairman, NRCS Surkhet Chapter
2. Mr. Lila Ram Subedi, Secretary, NRCS Surkhet Chapter
3. Mr. Kali Pd. Pandey, Co-ordinator and other members of BTC Committee
4. NRCS Surkhet DC office bearers and members
5. Mr. Govinda P. Acharya, DC officer, Surkhet Chapter
6. Mr. Prakash Shrestha, Blood Technician
7. Dr. RS Thakur, Medical Superintendent, and other three Medical Officer, Surkhet Hospital,
8. OT in-charge, sister-in-charge and other hospital staffs

Baglung

1. Mr. Biswa Nath Regmi, Chairman, NRCS District Chapter
2. Mr. Tika Ram Sapkota, Vice Chairman, NRCS District Chapter
3. Mr. Ashok Govinda Rajbhandari, Vice Chairman, NRCS District Chapter
4. Mr. Jagdish C. Upadhyay, Secretary, NRCS District Chapter
5. Dr. Tarun Poudel, Medical Superintendent and other hospital staffs
6. Mr. Lalit Tamrakar, Ms Pramila Sharma and Ms Amina Shakya Blood Technicians
7. Mr. Shiva KC, Vice-chairman, Baglung Jaycees
8. Mr. Arun Khanal. DHSP, Baglung
9. Mr. Rishi Ram Sharma, Mayor, Baglung Municipality

Myagdi

1. Dr. Bhupendra Khadka, Chairman, NRCS Myagdi District Chapter
2. Mr. Mukti Roka, Vice-chairman, NRCS Myagdi District Chapter
3. Mr. Resham Baniya, Vice-chairman, NRCS Myagdi District Chapter
4. Mr. Hari Krishna Shrestha, Secretary, NRCS Myagdi District Chapter and VDC Chairman, Beni VDC
5. Other office bearers and members and NRCS Myagdi District Chapter
6. Dr. Devi P. Bhusal, Medical Superintendent, Myagdi Hospital
7. Mr. Surendra Karna, Lab Technician, Myagdi Hospital
8. Staff nurses, ANMs and Administrative Assistant of Myagdi Hospital

Annex 3a

Kailali

List of equipment available

S.N.	Name of equipment	Nos.	Remarks
1	Refrigerator	4	2 not working
2	Deep freezer	2	(Attached)
3	Centrifuge	3	1 not working
4	Water bath	2	1 not working
5	Hot air oven	2	
6	Incubator	1	
7	Microscope	1	
8	Balance	1	
9	Distillation plant	1	
10	Colorimeter	1	
11	Autoclave	1	
12	Auto pipette	2	
13	Stethoscope	4	
14	Sphygmomanometer	4	2 not working
15	Sample rack	10	
16	Insulated blood transfusion box	1	
17	Working tables	2	
18	Generator	2	1 not working
19	Needle destroyer	1	
20	Bleeding beds	2	

Annex 3 b

Surkhet

List of equipment available

S.No.	Name of equipment	Nos.	Remarks
1	Refrigerator	2	
2	Deep freezer	2	(Attached)
3	Centrifuge	2	1 not being used
4	Water bath	1	
5	Hot air oven	1	
6	Incubator	1	
7	Microscope	-	
8	Balance	-	
9	Distillation plant	-	
10	Colorimeter	-	
11	Autoclave	1	
12	Auto pipette	-	
13	Stethoscope	2	
14	Sphygmomanometer	2	1 not working
15	Sample rack	4	
16	Insulated blood transfusion box	1	
17	Working tables	1	
18	Generator	1	
19	Bleeding beds	1	

Annex 3c

Tikapur

List of equipment available

S.No.	Name of equipment	Nos.	Remarks
1	Refrigerator	1	
2	Deep freezer	-	
3	Centrifuge	1	Not working
4	Water bath	1	Not in good condition
5	Hot air oven	-	
6	Incubator	-	
7	Microscope	-	
8	Balance	-	
9	Distillation plant	-	
10	Colorimeter	-	
11	Autoclave	-	
12	Auto pipette	-	
13	Stethoscope	1	
14	Sphygmomanometer	1	
15	Sample rack	1	
16	Insulated blood transfusion box	-	
17	Working tables	-	
18	Generator	-	
19	Bleeding beds	1	

Annex 3 d

Baglung

List of equipment available

S.N.	Name of equipment	Nos.	Remarks
1	Refrigerator	3	
2	Deep freezer	3	(Attached)
3	Centrifuge	3	
4	Water bath	1	
5	Hot air oven	1	
6	Incubator	1	
7	Microscope	1	
8	Balance	1	
9	Distillation plant	1	
10	Colorimeter	1	
11	Autoclave	1	
12	Auto pipette	2	
13	Stethoscope	1	
14	Sphygmomanometer	2	
15	Sample rack	4	
16	Insulated blood transfusion box	1	
17	Working tables	3	
18	Generator	1	

Annex 4

Sample Illustrative Elements/Consideration for establishing BTC (Annual collection and supply upto 1000 units of blood)

1. Physical structure

The following minimum physical facilities are recommended**:**

a) Lab room -1 (10'x12')
b) Donor room -1 (10'x12')
c) Night room -1 (8'x10')
d) Store room -1 (6'x8')
e) Toilet

2. Equipment

The following minimum equipment are recommended**:**

S.N.	Name of equipment	Nos.	Remarks
1	Refrigerator	2	(250 litres)
2	Deep freezer	2	(Attached)
3	Centrifuge	1	
4	Water bath	1	
5	Hot air oven	1	
6	Incubator	1	
7	Microscope	1	
8	Autoclave	1	
9	Stethoscope	2	
10	Sphygmomanometer	2	
11	Sample rack	4	As required
12	Insulated blood transfusion box	1	
13	Working tables	As required	
14	Generator	1	
15	Bleeding beds	1	
16	Furniture	As required	
17	View box	1	
18	Distillation plant	1	Optional
19	Needle destroyer	1	
20	Test tubes	As required	
21	Grouping tile	As required	

3. Supply of reagents and kits

Supply of reagents and kits should be ensured after estimating the consumption. Buffer stock should always be maintained.

4. Human Resources

At least two trained technicians

5. Networking with community organisations and local government

Networking with community organisations and local government is required to ensure collection of blood, and to secure support.

6. Collaboration and co-ordination with hospital

Collaboration and co-ordination with hospital in the manner and for the purpose dealt in detail in this report.

7. Effective Governance Structures

Effective governance structures should be designed and implemented with well-defined system and procedures for effective management of BTC.

8. Hospital services and availability of doctor

The demand for blood can't be created without the provision of doctor.

9. Financial Resources and cost sharing mechanism between different stakeholders

To manage the BTC effectively.

Acknowledgements

This review encompassing the blood transfusion services implemented by Nepal Red Cross Society in Kailali, Surkhet and Baglung districts was conducted with the primary objective of assessing the performance in the context of support of Nepal Safer Motherhood Project during the period of 1997-2000. However, the scope of the review enlarged during the review process so as to include central policy issues, which have direct bearing on the performance of these three districts. The review team would like to express sincere gratitude to Ms Susan Clapham, NSMP Project Director for bestowing confidence on the team to conduct this first ever review in the history of 35 years blood transfusion service programme in Nepal. The team would like to express sincere thanks to Dr L.R. Pathak, Director, Family Health Division Ministry of Health for his comments and input in the report, as well as for facilitating dissemination to a wider section of Government, bi-lateral and multilateral agencies and obtaining their comments and input on the review report. We are also thankful to Dr Indira Basnet and Mr.Gopal Kafle, NSMP officials for providing input for the review. We are indebted to the officials of NRCS particularly Mr Dev R. Dhakhwa, Secretary General and Mr. Tirtha R. Onta, Executive Director and Mr. Rishi Khanal CBTS for their valuable suggestions. We would like to put on record sincere appreciation to the chairpersons and office bearers of NRCS district chapters, and Medical Superintendent and staffs of the concerned hospitals we visited for patiently responding to our questions, providing documents, information and input without which the review would not have been completed. Lastly, thanks also go to DDC Chairmen and Mayors for taking time to discuss with us.

Ram K. Neupane, PhD
Team Leader

Contents

Acronyms

ANM	Auxiliary Nurse Midwife
BT	Blood Technician
BTC	Blood Transfusion Centre
CBTS	Centre Blood Transfusion Services Centre
CMA	Community Medical Assistant
CTEVT	Council for Technical Education and Vocational Training
DC	District Chapters
DDC	District Development Committee
DFID	Department for International Development
DoHS	Department of Health services
EBTS	Emergency Blood Transfusion Services
EOC	Emergency Obstetric Care
IP	Infection Prevention
MoH	Ministry of Health
NRCS	Nepal Red Cross Society
NSMP	Nepal Safer Motherhood Project
PHC	Primary Health Care Centre