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FINAL REPORT

DECEMBER 1983

AN

EVALUATION STUDY

OF

USAID-N / TRAIL SUSPENSION BRIDGE PROJECT (367-0119)

CONDUCTED FOR

USAID - NEPAL

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PDAAP 009

LIST OF ABBREVIATIONS USED

APAC	=	Asia Project Approval Committee
CBS	=	Central Bureau of Statistics
CNAS	=	Center for Nepal and Asian studies
DOR	=	Department of Roads
DR	=	Development Region
FY	=	Fiscal Year
GON	=	Government of Nepal
HFL	=	High Flood Level
HMG-N	=	His Majesty's Government of Nepal
PP	=	Project Paper
KHARDEP	=	Koshi Hill Area Rural Development Project
MPLD	=	Ministry of Panchayat and Local Development
NA	=	Not Available
NPC	=	National Planning Commission
IBRD	=	International Bank for Reconstruction & Development
IRR	=	Internal Rate of Return
IRD	=	Integrated Rural Development
SATA	=	Swiss Association for Technical Assistance
SRD	=	Suspension Bridge Division
TOR	=	Terms of Reference
TSB	=	Trail Suspension Bridge
TSBP	=	Trail Suspension Bridge Project
TU	=	Tribhuvan University
UNDP	=	United Nations Development Programme
US	=	United States
USAID-N	=	United States Agency for International Development/Nepal
USOM	=	United States Operation Mission now United States Agency for International Development

Best Available Document

PREFACE

Building of foot trail suspension bridges in the hills of Nepal has been taken up by HMG-N only since 1964 in a determined way. A Suspension Bridge Division was opened under the Department of Roads with USAID's initiative in 1964 and a planned effort was started. However, USAID(USOM then) has been involved in this field since 1958. Between 1958 and 1975, 23 suspension bridges with USAID fund were constructed in different parts of the country.

In August, 1979 USAID provided US $ 3.0 million as grant assistance to HMG-N to finance the procurement, fabrication and transport cost of materials to construct 24 to 36 trail bridges throughout Nepal over three years. The project was named USAID - TSBP : 037-0119 and in addition to bridge construction, it included provision for financing a contract which would undertake preparation of a countrywide map of trails and trails bridges, a study of boatmen displaced by the bridge construction and alternative employment opportunities as well as to provide short and long-term training.

The goal of the project as stated in the Project Paper is:

"To enhance the quality of life of rural population of Nepal by increasing the flow of goods and services to and from the rural areas".

The strategy of achieving the project's goal has been to upgrade HMG-N's institutional capacity to rationally improve the national bridge and trail network. The selection of bridge sites would be based on a survey utilising the objective selection criterion defined in the Project Paper.

The project has been under way since 1979 and the total number of bridges taken up to date is 41 out of which 22 bridges are completed, and the target for completion of the remaining 19 bridges was set at end of December 1983.

In view of the fact that the project is in its final stage of completion, an in-depth evaluation of the project, to determine the extent to which the project has been implemented to achieve its goals and purposes, was not only necessary for USAID-N but such an evaluation would be the important documentation for HMG-N to seek future donor assistance for building suspension bridges in future. To be more clear the objective of evaluation as stated in the 'Scope of Work' (Annex 1) will be in order here :

> "The overall objective of this final indepth project evaluation is to determine the extent to which these project goals and purposes have been achieved. The evaluation will review the effectiveness of project inputs in achieving results at the output and purpose level, as indicated in the PP's logical framework. Further, it will look at the assumptions upon which the project was designed, in order to determine their appropriateness for project success. Project Paper analysis (technical, economic and financial) will be reviewed retrospectively to determine accurateness and relevance for future project designs, Since this evaluation will be used by the Government of Nepal in planning for future bridge construction and in seeking other donor assistance for such construction, it is imperative that the evaluation presents documentation and recommendations that will be useful for this purpose, i.e. based on the results of this project, what changes, refinements, etc., should be considered in follow-on projects or within the Suspension Bridge Division 'SBD) itself".

EAST Consult (P) Ltd., which had conducted two studies for USAID-N on Trail Suspension Bridges, in 1977 and 1980 was once more assigned this important responsibility in July 31, 1983.

The 'TOR' of the evaluation study has addressed itself to five specific questions (Chapter 1.4). Five bridge sites which were possible to visit during the middle of rainy season were selected for impact studies. However, as two bridges were under construction, their impact evaluation could not be done and only technical observations were made (Annex 3).

A methodology was developed during the early phase of the study and was finalised with USAID officials. (Annex 2).

This draft report is the culmination of the whole exercise done by the study team during the last two and half months, and includes findings and recommendations of the study.

The report has been presented in five different chapters. Each chapter provides the answers to the specific questions raised in the 'TOR'. The first chapter however is only the Introduction. On the whole, the present report basically follows the format prescribed in the contract document.

Limitations : The study suffers from two major limitations - firstly there was no proper recording and maintenance of information in the SBD. Even information like the number of requests for bridge construction, survey reports of recently constructed bridges of initiation and completion of bridges, annual progress reports on targets and achievements etc, which ought to have been readily available, was either unavailable or incomplete. Therefore, much of the analysis and conclusions necessarily had to be based on qualititative information and impressions obtained through interviews with the SBD officials. Secondly, the timing of the study during the monsoon period as well as limited time available made it necessary to visit only the easily accessible bridges for impact evaluation (Chapter 2). Therefore the evaluation has been an impressionistic generalization for all the bridges constructed will not be valid.

The poor record keeping system in SBD, coupled with the difficulty of obtaining even the available data in time from some SBD officials, resulted in a little delay in the submission of this report.

However, in in-spite of these limitations, we have made an honest effort to conduct this important study and tried our best not to deviate from the reality and truth as we have perceived at the time of writing this report.

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December 1983

ACKNOWLEDGEMENT

During the course of the study, valuable information and relevent data were provided to us by varinus officials, bridge users, local leaders and knowledgeable persons of bridge site areas. We sincerely acknowledge their useful help and would like to offer our sincers thanks to all of them.

Special mention is made here of Mr. S.K. Lakoul, SBD Chief, and his assistant engineers, SATA's Mr. Guyer who tried their best to provide us with almost all information relevent to this study. Their patience in answering our lengthy questions is worthy of our appreciation. We heartily thank them.

Thanks are due to Mr. Virgil Miedema, and Mr Damodar Suwal of USAID-N, who provided us access to their valuable records and documentation at USAID-N, on TSB Project, contributing to the better understanding of the Project.

Lastly Mr. S. Bhadra who edited the language of the report as well as the report preparation team is worthy of our appreciation and we sincerely thank them.

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EXECUTIVE SUMMARY

1. Maximum positive impacts of trail suspension bridges are achieved when they are constructed on major/medium rivers and located in the major/main trails.

2. Current bridge site selection procedure of the SBD is subject to personal judgement and political pressures. There exists a fairly good system of screening bridge demands and survey but no objective basis and guidelines for selection and ranking. The USAID's attempt to introduce objective selection and ranking criteria failed due to lack of will and commitment of SBD and laxity of the USAID. Also its use may not have assured a judicious selection. A more appropriate system of selection and ranking is proposed which improves upon the existing system and takes into consideration national needs and priority.

3. The fiscal procedure agreed for release of USAID grant did not w ork properly due to bad fiscal management of the SBD. A 'revolving fund system' is suggested for future aids but this does not substitute the need for better fiscal management and scientific accounting system within the SBD.

4. Technical capability of the SBD has significantly improved during recent years. The main problem is efficient organization management, and planning. Very little technical support will be necessary in future aid projects.

5. An effective preventive maintenance system of suspension bridges constructed by SBD throughout the country should be instituted without delay.

STATEMENT OF CONCLUSION AND RECOMMENDATIONS

A. Impacts of Trail Suspension Bridges

Conclusions :

1. In general, suspension bridges have enhanced socio-economic mobility of local people. But the extent of the impacts vary with the type of trail and type of river on which a bridge has been erected.

2. Bridge constructed on a minor river, like Kokaha has created very little local impacts. Since the Kokaha bridge is also located on a major trail its main benefit is limited to savings in time and money of long distance traffic during occasional flash floods in wet season.

3. Bridge located on a major river and a main trail like Benighat has significant social and economic impacts on the life of the local people.

4. Bridge located on a medium river and main trail has potential of enhancing socio-economic mobility. But no definite conclusion can be drawn from the case of Andhi Khola Bridge (which have there characterstics) since it merely replaced an old but serviceable suspension bridge.

5. Negative impacts have been noted only in the case of Benighat bridge which displaced traditional ferrymen and increased the rate of exploitation of forest resources on the right bank.

Recommendations :

1. Construction of bridges by the SBD should be limited to major and main trails located on major and medium river only.

2. Before deciding to construct a new bridge a careful assessment should first be made on the adequacy or improvement possibility of existing crossing facility, particularly when there already exists bridge as in the case of Andhi Khola (Galyang).

B. Judicious Bridge Site Selections

Conclusions :

1. Attempt to introduce an objective site selection and ranking criteria by the USAID failed due to varicus factors like lack of will and commitment of the SBD, SATA's reluctance to introduce the change, laxity of enforcement of grant agreement and expediency on the part of USAID.

2. The USAID proposed PP criteria does not incorporate national needs and priority and its use may not ensure judicious site selection.

3. Although a fairly appropriate system of screening demands for bridge construction now exists in the SBD, there is a lack of reliable information, of a good trail network and bridge map, of specific guidelines for survey crew, and of a systematic procedure for priority ranking. Therefore, site selection is currently subject to personal judgement and political pressures.

4. Demands being far in excess of the SBD's capability the current selection process must be improved.

5. Deletion of the 'National Trail Classification Map and Study' of the TSBP Agreement has set back the institutionalization of judicious site selection process within the SBD.

Recommendations :

1. The current method of soliciting bridge request from the District Panchayats should be continued.

2. Total annual budget of the SBD should be appropriated to the five development regions and on this basis a short list of potential bridge sites be prepared.

3. The SBD should construct bridges located only on 'major' and 'main' trails. For defination of major/ main trails, see Effects of Trail Bridges Vol I, East Consulting Engineers, June 1978, Appendix D-A-4, which provides indicative classifications of Trails, class A as Major, and class B as Medium (main) trail.

4. The existing SBD-SATA check list can be used for site surveys with suitable modifications for feasibility assessments.

5. If the survey-in-charge determines that the requested site is located in the major or main trail and if existing crossing facility is inadequate then detail technical survey should be undertaken.

6. After completion of surveys priority ranking within each development region should be made by the SBD using the following criteria :

   (a) Top priority to bridges on 'major' trails and lower priorities to 'main' trail.

   (b) Within each category of 'major' and 'main' trails higher priority to sites with larger volume of traffic and on major rivers.

   (c) Cost should not be considered if it lies within a fixed reasonable upper limit.

7. High priority should be given to the completion of the proposed National Trail & Bridge Network mapping.

C. Evaluation of the Fiscal Procedure

Conclusions :

1. Reimbursement system of fund release is not practical because the SBD lacks access to working capital.

2. From the SBD's point of view 'advance' system is the must. But the bad state of fiscal management within SBD must improve for any system of fiscal procedures to work effectively.

3. Since last years fiscal management has improved due to new addition of accountants and relatively prompt submission of accounts from construction sites.

Recommendations :

1. A scientific accounting system which gives exact cost incurred in each bridge construction is recommended to be introduced within the SBD although it is not statutorily required by the overall HMG's accounting procedures.

2. In future aid projects a fixed 'revolving fund system' is suggested to be instituted which has elements of both the advance and reimbursement system but may be more appropriate for control of funds.

D. Institutional Capability of the SBD

Conclusions :

1. Physical achievement and technical capability of the SBD has improved significantly during recent years.

2. With recent increase in staffs, technical manpower (engineers, overseers etc.) is now adequate to complete 40-45 bridges per annum.

3. The training provided outside the country by the USAID under the TSBP Agreement has not been beneficial to the SBD. The SATA initiated regular in country training programms in the SBD have been more effective to ungrade staff capability.

4. Financial resource has not been a constraint for the SBD so far.

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5. The major problem in the institutional capability of the SBD is the administrative, fiscal, and store management problems which must be improved for its more efficient functioning.

6. Project planning in the SBD is defecient. Annual planning, as at present, cannot ensure proper functioning of SBD whose activities are necessarily time phased for several years.

7. There is no preventive bridge maintenance program. Current bridge maintenance activities are ad hoc and unplanned.

8. Although the SBD has developed technical capability, planning and administration needs improvement for its more effective institutionalization.

Recommendations :

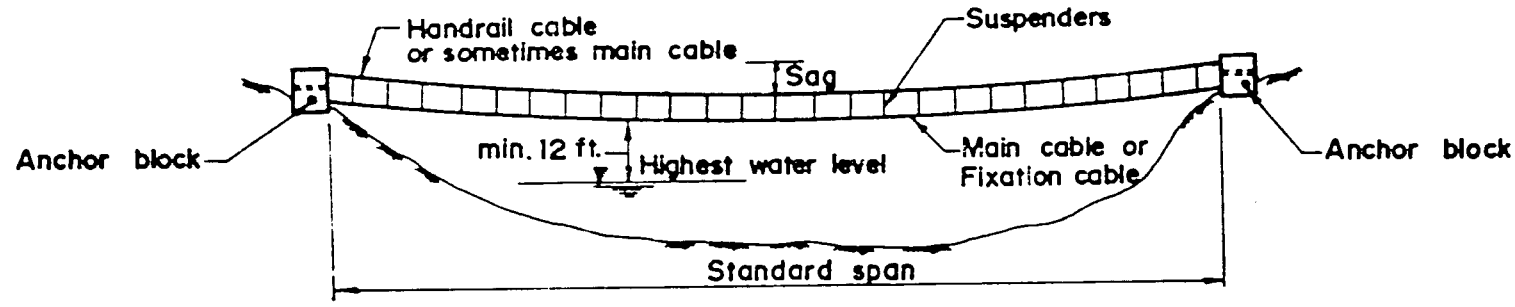
1. In future aid projects very little technical support will be necessary for the SBD.

2. Although finance has not been a major constraint so far, the termination of USAID support and gradual withdrawal of SATA may create a gap in future. The government should either increase its allocation substantially or seek alternate sources of foreign aid in future.

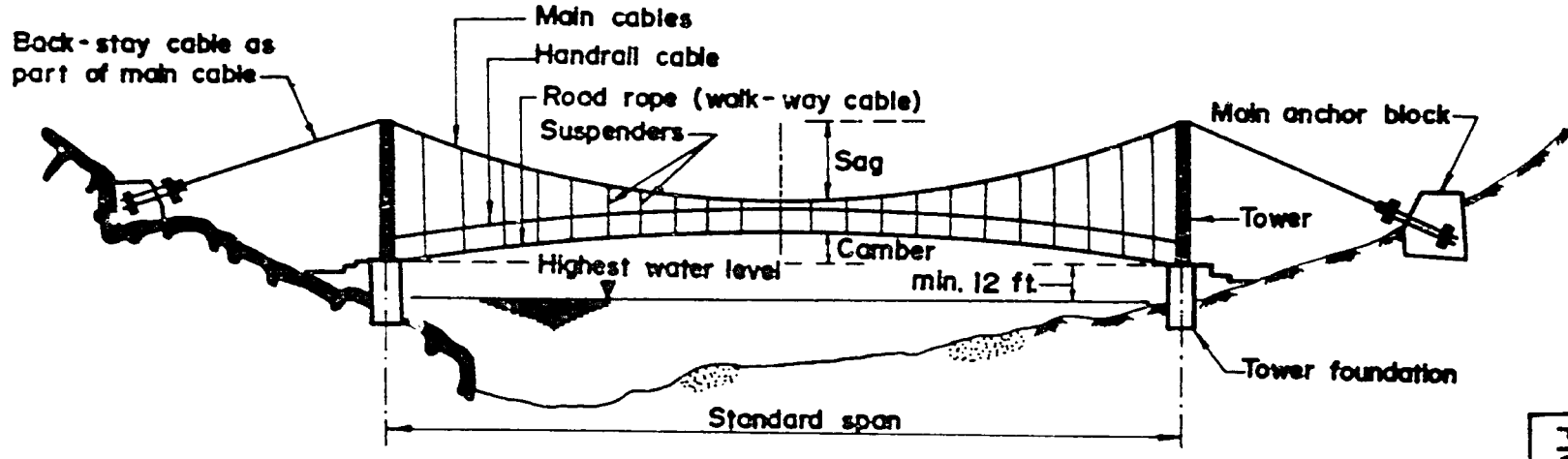
3. The administrative and fiscal management problems must be improved for maximum achievement of its potential. Since these problems are not limited to the SBD alone but exists in all government agencies in general, improvement in these areas could only be gradual.

4. A medium term planning system should be introduced so that various time phased activities like survey, design, fabrication, transportation and erection can be planned well in advance.

5. An effective preventive maintenance system of suspension bridges constructed by the SBD throughout the country must be initiated and implemented without much delay.



TYPICAL TRAIL SUSPENDED BRIDGE



TYPICAL TRAIL SUSPENSION BRIDGE

FIG.- 1

USAID
TRAIL SUSPENSION BRIDGE PROJECT
EVALUATION STUDY

TYPICAL SKETCH OF TRAIL
SUSPENSION & SUSPENDED BRIDGE

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CHAPTER - 1

INTRODUCTION

1.1 Need for Trail Suspension Bridges in Nepal

Nepal's hill regions between the Terai and the Tibetan plateau are extremely complicated geophysically, reinforcing the traditional sense of separate identity among the various hill communities. The combination of various mountain ranges and the river system running in counter directions has made communications in the hills of Nepal extremely difficult. Nevertheless people in the hills have been moving, out of necessity, from one place to another creating countless trails over these hills. However, the tendency has been to develop better communication links either with India to the south or with Tibet to the north. These north-south trade routes (major trails) supporting trans-Himalayan barter trade, exchanging Tibetan salt and wool for Nepali food grains and Indian consumer goods, were once an important source of income for hill Nepal. However following restrictions from the Chinese the barter trade has declined sufficiently, but the trade routes still from the major supply lines to the hills. These north-south trails are crossed at many places by regional routes, and many minor trails link up with this major trail system serving mainly local needs of importance. The weakest points on these trail systems are the countless rivers and Kholas which cross them in counter directions creating big obstacles to the smooth and proper communications. The problem of bridging these rivers and Kholas for integrating the diverse social and regional units into a modern nation-state is still very real. The solution to this problem is not the development of a nation-wide road system which would not be a feasible proposition for many years to come, because Nepal's economy for sure, will not be able to support such a road network system. And therefore, one is left with the only option of building improved trails and trail bridges.

Building of improved trails and bridges in the hills has, no doubt, had potential socio-economic benefits which can directl help the rural poor. These people in the hills whose time, money and labor are saved in crossing the rivers, are the potential benefeciaries. There is no doubt that the rural population in the hills therefore wants and will accept assistance in building bridg The unusually high demand and requests for trail suspension bridge from every corner of the country itself testify to the validity ar immediate need for building these bridges.

And apart from the socio-economic benefits, the TSB Program will serve a potential political need i.e. the integration of Nepa as a modern nation-state. And in this direction, it is felt, only a begining has been made.

1.2 Brief History of Suspension Bridge Division

Although building of trail bridges in the hills of Nepal, with Government effort and resources, was started around 1903, people in the hills out of sheer necessity have always built their own bridges. Around 1903, during the reign of Maharaja Chandra Samsher J.B. Rana, some modern suspension bridges at vital points of interest to the ruler himselfwere built with British technical help. Very little attention was however given to the needs of the people as such.

After 1951, when the Ranas were thrown out, and some interest in the needs of the people was taken by some public leaders a new dimension to this very important project-building of trail bridges in the hills - began to take shape. And in this process a planned suspension bridge building program for the needy people of the hills took shape in 1958 under USOM's aid program. A target

of 25 trail bridges with equal funds from USOM and GON was set in the plan. A revised project agreement in 1962 was signed, which had an ambitious plan to construct 72 bridges and cableways throughout the country and when this program ended up in a bitter failure, reflecting its inability to construct even one till 1964[1/], a revised plan to construct 36 bridges was drawn up. The result was the recognition of the fact that until enough institutional capability was developed within GON's organisational structure, it would be futile to set just ambitious 'paper' plans. And therefore one can conclude that this severe jolt of a drastic failure of a plan led American doners to give a serious thought to developing an institutional infrastructure to carry out suspension bridge projects in Nepal, to which USAID so closely adheres even now. Thus in 1964, USAID proposed to establish a separate Suspension Bridge Division to be jointly administered by HMG and USAID. And this led to the birth of SBD under the Department of Roads of HMG in 1964. And this organisation was then successful to build at least 12 out of 36 planned suspension bridges within 4 years, i.e. upto 1968. USAID continued its aid up to 1975 and SBD built 23 bridges with USAID fund; however the plan was to build 46 bridges.

In 1971, HMG requested SATA to provide SBD with technical personnel. SATA's contribution to SBD between 1972 and 1977 is note-worthy, it performed reconnaissance of new bridge sites, created a design section, and provided direct assistance in design and construction of bridges. A survey and design manual was prepared for the first time in SBD, and a record file on the bridge conditions of completed bridges to be maintained as 'Bridge Register' was also initiated in SBD with SATA effort.

1/ See Effects of Trail Bridge Part A Vol. I Final Report pp 9 Table O-T-1, East Consulting Engineers, June 1978.

Though SBD has made remarkable improvements in technical capabilities to build bridges in the last decade it was not able to give much attention to the project preparation process. Most of SBD's time was spent organising construction management as well as acting as a coordinating agency between different aid donors such as SATA, USAID, UNDP, IBRD. And in this race to increase bridge building capacity, SBD's initial aim to provide bridge facilities to the most needy people of the hills has been overshadowed during this period. "And the Fifth Plan (1975-80) marked a major departure from the earlier plans in terms of a new emphasis on the need to conduct detailed techno-economic feasibility studies before the programming of suspension bridges".[2] In 1975-76 'German Consult' conducted a study to select bridge sites based on a cost/benefit analysis, the study was financed by UNDP and executed by IBRD. Out of 43 bridges, 22 bridges showed IRR of more than 10%.

In 1977, USAID entrusted a study to East Consulting Engineers, and the aim was to develop a set of criteria for bridge sites selection, based on factors related to socio-economic benefits that would acrue to the rural poor. The study thus focused its findings on defining a selection process and provided a prescription to follow. This is reflected in a statement in the EAST report "while we are of the opinion that there should be major realignment in the institutional structure at the central level for an effective country-wide trail bridge program, the <u>selection process</u> recommended here details the most effecient ways of decision making within the institutional arrangement existing under HMG at present".[3/] The study was completed in June 1978.

2/ Effect of Trail bridges Part A, Vol. I East Consulting Engineers, June 1978 pp 13.

3/ Effects of Trail Bridges, Part A Vol. I, East Consulting Engineers, June 1978 pp 44.

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In this way the problem of 'Judicious' bridge site selections was once again brought to the attention of SBD authorities. The selection process elaborated in the study however was not taken seriously by SBD and no efforts were ever made to actually implement it. Therefore in 1979-80, USAID tried to introduce a new concept of objective model formulation. A set of "priliminary criteria have been worked out by GON, USAID and SATA personnel drawing upon the General Consult and East reports and the GON/SATA (SBD) experience in the field"[4/]. However the East report (1978) never recommended in favour of an objective model formulation. East report in its preface (pp ix) clearly states "it is not practicable to indulge in objective model formulations only in such a subjective and politically delicate problem as bridge site selection. It is necessary to try to devise a mechanism, or a system based on a subjective approach, by making use of a framework which explicitly incorporates the social, economic and political factors as a whole"[5/].

However USAID included this PP ranking criteria in the TSB - agreement and gave sufficient emphasis to SBD's use of these criteria as an objective tool for bridge site selection. The application of these criteria was a pre-condition for release of funds under section 4.3 of the Grant Agreement.

USAID being desirous of refining and developing the PP ranking criteria, with the aim of incorporating them eventually into the SBD's site survey process, entrusted East Consulting Engineers with the task of testing the PP criteria on ten pre-selected bridges. East Consulting Engineers tested the PP criteria and came out in November 1980 with a site Survey Manual to be utilized by the SBD's survey teams for ranking the potential trail bridges. East Consulting

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4/ PP 'Economic Analysis' pp 20.

5/ Effects of Trail Bridges, Part A Vol. I, East Consulting Engineers June 1978, pp ix.

Engineers submitted 100 copies of a brief, step-by-step, bilingual (Nepali/English) Field Manual for utilisation by SBD survey teams.

SBD was thus provided with an opportunity to test the validit of an objective site selection tool. However because of various reasons the Manual was never used by SBD, and therefore the hypothesis that "the Manual will make a substantial contribution to the enhancement of SBD's present professional and institutional capacit for selecting and ranking trail bridges sites in the country in a more rational way"[6/] could never be tested in practice.

1.3 USAID's TSB - Project

In August 31, 1979 USAID signed an agreement with HMG-N which provided US $ 3.0 million grant to finance the procurement, fabrication and transportation of materials to construct between 24 and 36 bridges throughout Nepal over three years. In addition, the project included preparation of Map of classification of trails in Nepal, a study of tradesmen (boatmen) who are displaced by the construction of bridges and recommendations for alternative employment opportunities as well as long term and short term training.

The targets of the project as stated in the project Paper are as follows :

- "To systematize the method of selecting bridges to be constructed, so as to maximize the socio-economic considerations and to minimize political pressures in setting construction program priorities. To this end selection criteria were incorporated into the project".

- "The present estimate indicated that the USAID would finance the costs for 24 to 36 bridges throughout the life of the project".

6/ Site Survey Manual, East Consulting Engineers, November 1980, pp (i).

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The project was built upon the existing, ongoing HMG program by concentrating on the development & utilization of a methodology for bridge site selection.

The USAID Grant of $ 3,000,000 had the following components:

1.	$ 2,600,000	Construction of 24 to 36 bridges
2.	$ 250,000	Development of Trail Map
3.	$ 65,000	Training Costs of DOR Engineers in Geological Fields.
4.	$ 10,000	Study on Tradesmen Displaced
5.	$ 25,000	Project Evaluations
6.	$ 20,000	Imports for Local Bridge Program
Total	$ 3,000,000	

Under the Project Fund SBD has taken up 41 bridges for construction and to date 22 bridges have been completed. The initial project period was up to August 1982, which was later extended to June 30, 1983. The targeted completion date for all the remaining 19 bridges is December, 1983[7/]. However, USAID obligation for financing the cost has terminated along with the termination of TSBP agreement on June 30, 1983.

1.4 Statement on Evaluation Objectives

The main objective of the proposed final indepth project evaluation, as spelled out in the Scope of Work, is to determine the extent to which the project goals have been achieved. Five specific questions which the evaluation is expected to answer are:

1. How and to what extent have the lives of the people living in the bridge-site areas been affected by this project ?

7/ Bridge list supplied by USAID - TSBP. See Annex 5.

2. Are the bridge-site selection criteria which are actually used in the project adequate to assure judicious selection of construction sites ? How do these criteria compare with those used previous to this project ?

3. Did the fiscal procedures developed during the course of this project contribute to the smooth running of the Project? What specific recommendations can be made regarding procedures to be used in any future project ?

4. Has the ability to plan,budget for, construct and maintain bridges been sufficiently institutionalised within the SBD to assure its functioning efficiently without technical assistance from any outside donor ?

5. Has the lack of certain planned inputs hindered project success ? Since this evaluation will be used by HMG in planning future bridge construction, it is imperative that the evaluation presents documentation and recommendations that will be useful for this purpose.

The methodology used for the evaluation of these objectives is given in annex 2.

CHAPTER - 2

IMPACT OF TRAIL SUSPENSION BRIDGES

2.1 Expected Impacts of Suspension Bridges :

EAST Consulting Engineers (now EAST Consult) in 1978 had already conducted a detailed impact study of 13 bridges throughout the Kingdom.

This detailed and comprehensive study has clearly shown the social, economic, institutional and environmental impacts the bridges have had on the rural hill population of Nepal. In congruence with the similar objective, the present study has been initiated to make an impact study of five bridges : Kokaha, Gallyang, Benighat, Naikhandi and Raighat. However, only three bridges - Kokaha, Gallyang and, Benighat were completed recently and the other two are still under construction. This study therefore is focused on the effects of only three completed bridges[1/]. A seperate technical observation of the two other bridges is presented in Annex 3.

The expected impacts of the bridge are as follows :

Social Impacts

- Safety in travel (improvement in access to and mobility of people);
- increased access to educational facilities;
- increased access to health facilities (including family planning services and wider access to faith - healers);
- increase in social and religious interactions (including marriage across the river);

1/ The bridge completion dates are as follows : Benighat Aug. 1979; Kokaha - July 1981; and Gallyang July 1981.

- increased access to governmental and semi-governmental institutions;
- improved government services because of mobility of government officials and extension agents;
- improvement in women's welfare due to time and labor savi in collecting fuel, fodder and in grazing livestock.

Economic Impacts

- Saving in time and money :
- increase in agricultural production;
- increased flow of good and services, particularly exports
- impetus to growth of non-agricultural economic activities (e.g. cottage industry);
- regularity in food supply and consequently seasonal stabilization of price.

Institutional Impacts

- development of market centers/growth points.

Environmental Impacts

- effects on forest resources.

The discussion below shows the impacts the bridges have had on the people of the area under study.

2.2 Survey Findings :

Characteristics of the bridge sites : It is worth noting that each bridge site surveyed in this study presents uniqueness due to its geographical setting, the type of the river and the kind of trail served.

The Kokaha is a 'minor' river[2/]. It is not fordable only during flash-floods in the wet season[3/]. The Kokaha bridge connects two districts-Sunsari in the south and Dhankuta in the north. The bridge serves a major trail[4/]. It has mostly 'through' (long distance) traffic. It links the major trading centers in the south -- Chatara and Dharan (one of the largest trading centers for the hill districts of Eastern Nepal) and in the north -- Bhojpur, Khotang, part of Dhankuta and Diktel districts.

The Andhi Khola, on the other hand, is a 'medium' river. The river can be forded at certain places during the dry season. The bridge over the Andhi Khola is situated in Syangja district. The bridge serves a main (medium) trail used by the people of part of Syangja, Gulmi, Parbat and Baglung district. The bridge is located at less than a half kilometer distance from the main Gallyang bazaar located on Pokhara-Sunauli Highway and a new bazaar has also been developed since 1977 right at the bridge site.

2/ For the indicative classification,of rivers, see Effects of Trail Bridges, Vol 1, Final Report (Appendix D-A-5, Part A), EAST Consulting Engineers, Kathmandu, June 1978.

3/ The local people reported that the Kokaha Khola (river) sometimes blocked traffic for 1-3 days during the wet season before the bridge construction.

4/ For the indicative classification of trails see Effects of Trail Bridges, Vol 1, Final Report (Appendix D-A-4, Part A) EAST Consulting Engineers, Kathmandu, June 1978. Also see Chapter III of this report.

The Trisuli is a 'major' river. It is unfordable throughout the year. The Benighat bridge over the Trisuli river connects two districts - Gorkha in the west and Dhading in the east. The traditional ferry crossing at Benighat served a major trails for long distance traffic before the completion of the Prithivi Rajmarga - Gorkha highway. The long distance traffic has now declined because of the diversion of traffic through this highway. But Benighat has developed into a major supply center and the trail is still being extensively used by the people of the southern part of Gorkha District.

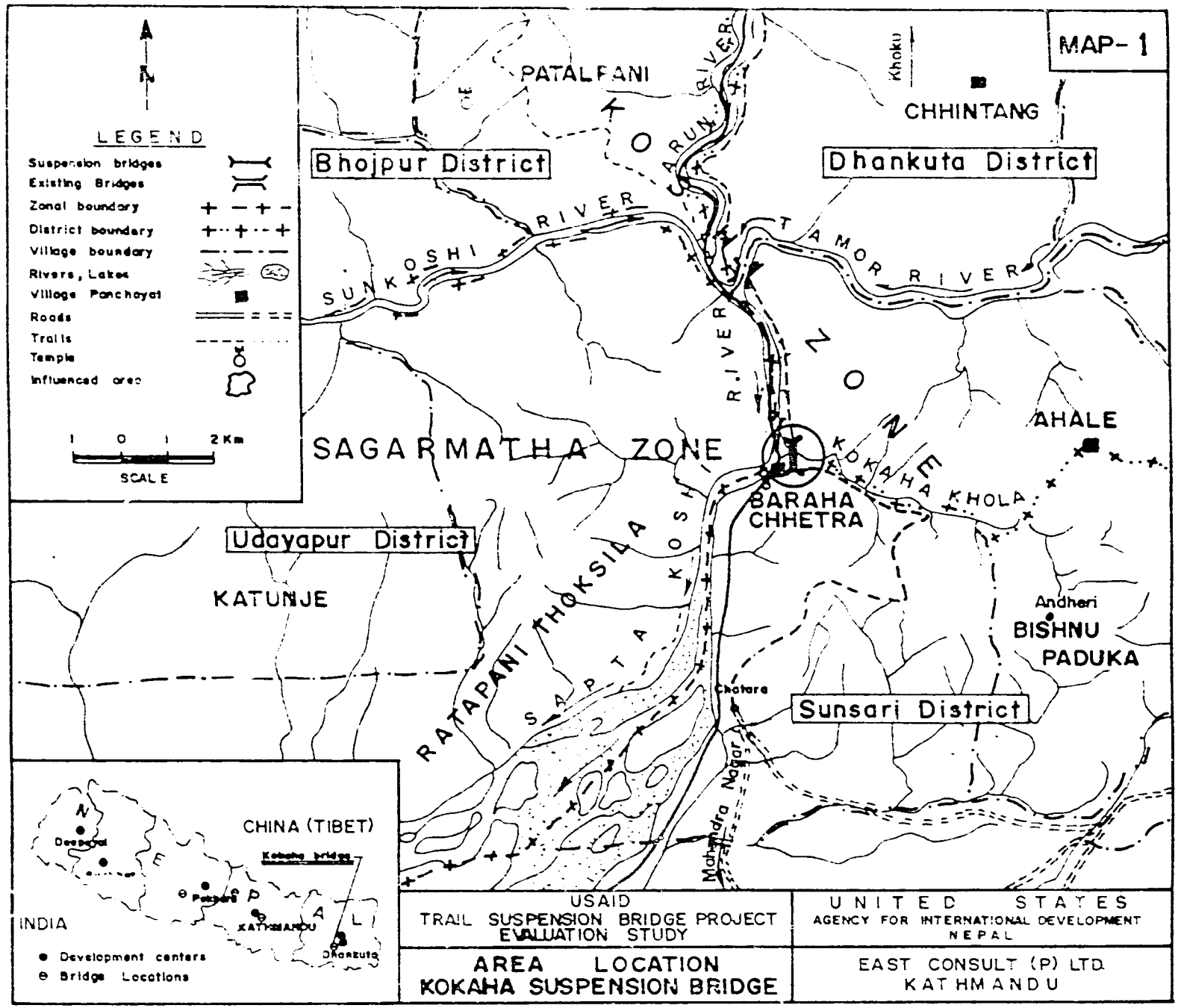
The approximate area of influence[5/] of the bridges mentioned above are shown in the maps (Map 1,2 and 3). An estimated number of people influenced by the bridges is given in Table 2.1.

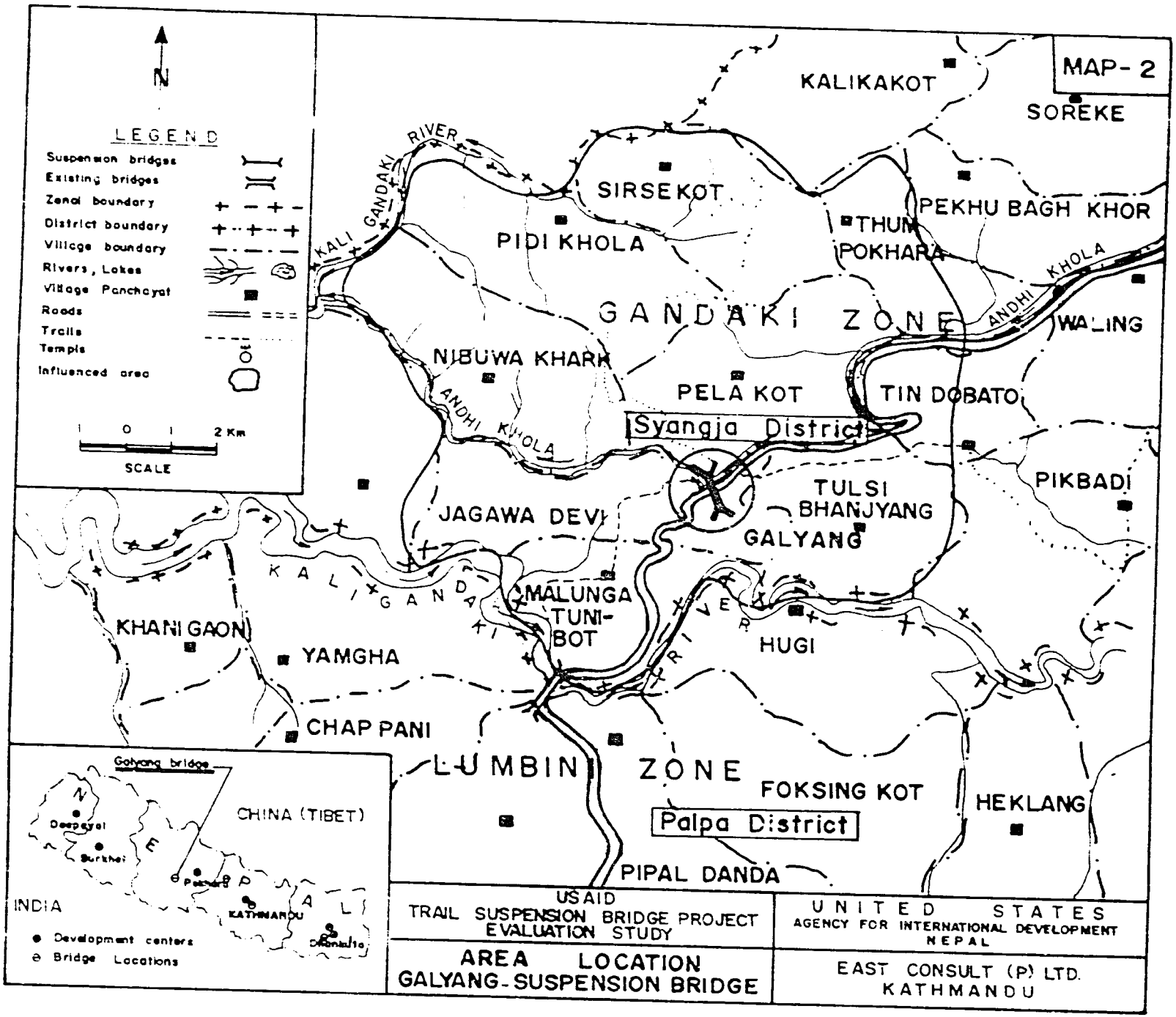
Table - 2.1

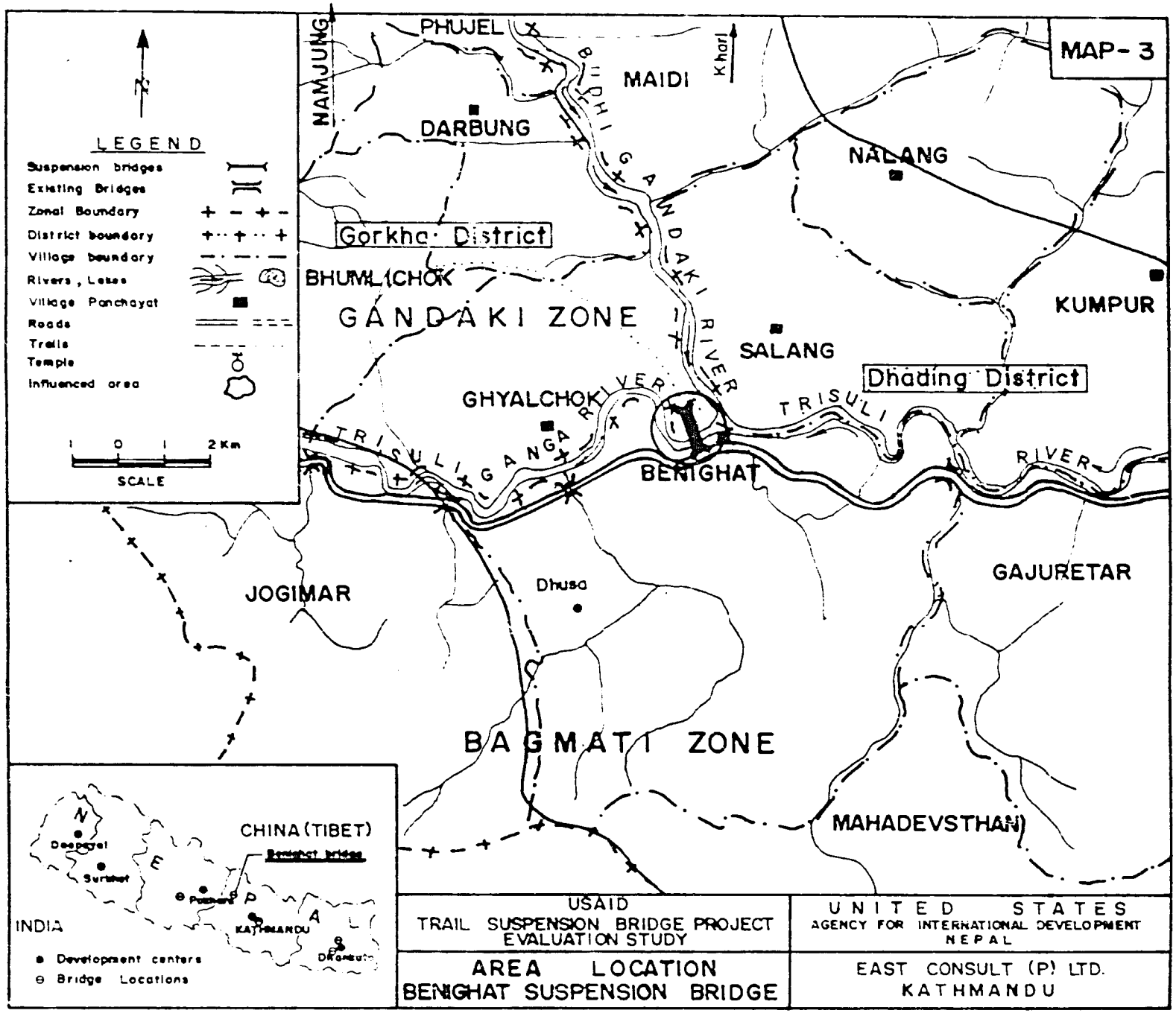
Estimated Number of People Influenced by the Bridges

Bridge	Estimated number of People influenced		
	Right Bank	Left Bank	Total
Kokaha	10,025	25,639	35,664
Gallyang	20,548	17,048	37,596
Benighat	20,399	19,635	40,034

5/ The area of influence as noted here, indicate those areas which lie within a day's back and forth walking distance from the bridge site.


MAP- 1
LEGEND
Suspension bridges
Existing Bridges
Zonal boundary
District boundary
Village boundary
Rivers, Lakes
Village Panchayat
Roads
Trails
Temple
Influenced area
1 0 1 2 Km
SCALE
N
PATALPANI
CHHINTANG
Khoku
Bhojpur District
Dhankuta District
SUNKOSHI RIVER
ARUN RIVER
TAMOR RIVER
SAGARMATHA ZONE
KOKAHA KHOLA
BARAHA CHHETRA
AHALE
Udayapur District
KATUNJE
RATAPANI THOKSILA
SAPTA KOSHI
Chatara
Sunsari District
Mahendra Nagar
Andheri
BISHNU PADUKA
CHINA (TIBET)
Kokaha bridge
INDIA
Deepayal
Pokhara
KATHMANDU
Dhankuta
Development centers
Bridge Locations
USAID
TRAIL SUSPENSION BRIDGE PROJECT
EVALUATION STUDY
UNITED STATES
AGENCY FOR INTERNATIONAL DEVELOPMENT
NEPAL
AREA LOCATION
KOKAHA SUSPENSION BRIDGE
EAST CONSULT (P) LTD.
KATHMANDU


MAP- 2
N
LEGEND
Suspension bridges
Existing bridges
Zonal boundary
District boundary
Village boundary
Rivers, Lakes
Village Panchayat
Roads
Trails
Temple
Influenced area
0 1 2 Km
SCALE
KALIKAKOT
SOREKE
KALI GANDAKI RIVER
SIRSEKOT
PIDI KHOLA
THUM POKHARA
PEKHU BAGH KHOR
ANDHI KHOLA
WALING
GANDAKI ZONE
NIBUWA KHARK
ANDHI KHOLA
PELA KOT
TIN DOBATO
Syangja District
PIKBADI
TULSI BHANJYANG
GALYANG
JAGAWA DEVI
KALI GANDAKI RIVER
MALUNGA TUNI-BOT
HUGI
KHANI GAON
YAMGHA
CHAP PANI
LUMBINI ZONE
FOKSING KOT
Palpa District
HEKLANG
PIPAL DANDA
Gotyang bridge
CHINA (TIBET)
INDIA
Deoprayal
Burkhai
KATHMANDU
Development centers
Bridge Locations
USAID
TRAIL SUSPENSION BRIDGE PROJECT
EVALUATION STUDY
UNITED STATES
AGENCY FOR INTERNATIONAL DEVELOPMENT
NEPAL
AREA LOCATION
GALYANG-SUSPENSION BRIDGE
EAST CONSULT (P) LTD.
KATHMANDU


MAP- 3
LEGEND
Suspension bridges
Existing Bridges
Zonal Boundary
District boundary
Village boundary
Rivers, Lakes
Village Panchayat
Roads
Trails
Temple
Influenced area
1 0 1 2 Km
SCALE
NAMJUNG
PHUJEL
MAIDI
Khari
DARBUNG
NALANG
Gorkha District
BHUMLICHOK
GANDAKI ZONE
KUMPUR
SALANG
Dhading District
GHYALCHOK
TRISULI GANGA RIVER
BENIGHAT
TRISULI RIVER
JOGIMAR
Dhusa
GAJURETAR
BAGMATI ZONE
MAHADEVSTHAN
CHINA (TIBET)
Benighat bridge
INDIA
Deopatal
Surkhet
Pokhara
KATHMANDU
Dhankuta
Development centers
Bridge Locations
USAID
TRAIL SUSPENSION BRIDGE PROJECT
EVALUATION STUDY
UNITED STATES
AGENCY FOR INTERNATIONAL DEVELOPMENT
NEPAL
AREA LOCATION
BENIGHAT SUSPENSION BRIDGE
EAST CONSULT (P) LTD.
KATHMANDU

Social Impacts : The Kokaha bridge has not helped much to enchance the local social activities. A single primary school exists at Barahachetra (left bank) and only since the beginning of 1983 seven students from the right bank have started utilizing this bridge to attend the primary school. Middle and high schools are located on either bank of the river, but students stay on either side as these schools are located more than 2½ hours walking distance (about 8 Kilometers) from the bridge. Except for one health post at the Indian Kosi Barrage Project which provides some health service in the area, there is no public health center close to the bridge. The Kokaha bridge area is thinly populated[6/] and collecting firewood and fodder is not a problem on either bank of the river. Women involve themeselves in these activities at their convenience and the bridge has hardly saved their time, Marriages and the religious festivals and fairs[7/] take place mostly during winter when the river is easily fordable. However, there was a risk of life involved in fording the Kokaha Khola during the flash floods.

On the otherhand, the social benefits of the bridge at Benighat are easily noticeable. The people living on the right bank must use the bridge to avail themeselves of the facilities of schools, health, market and administrative centers located on the left bank of the river, i.e. Benighat bazaar. The children of Majhi Tar Village at right bank use the bridge to attend the primary school at Benighat. Though primary schools and a high school are also located on the right bank (about 4-6 kms walking distance), it was reported that students prefered to attend schools at Benighat because of 'good' teachers and easier trails to the schools. Mobility of people across the river has been reported to have significantly increased for social, economic and religious activities every day.

6/ Only 25 to 30 households were seen on both banks of the Kokaha Khola.

7/ On the left bank of the river, at Barahachetra temple two large religious fairs take place during November & January.

The firewood and fodder collection areas in Benighat lie mostly on the right bank and thus access to these resources has become easier than before because of the bridge. The bridge on an average, has saved the women of the left bank one to two hours per trip for collecting fire wood and fodder. Some of the women living on the right bank come to the left bank almost everyday for short-term labor employment such as agricultural work or for selling fruits, country liquor a bundle of firewood and the like.

In Gallyang, where a suspension bridge constructed by the District Panchayat in 1972 existed till recently, it is clear that the socio-economic impact of the new bridge is minimal. According to the local informants, the old bridge used to swing much while crossing and was in a dilapidated condition but nevertheless serviceable. However there was no reporting of deaths from the old bridge. The new bridge has provided a psychological safety in travel. The new bridge also provided a crossing facility for livestock which was not possible before. It has made travel relatively easier for people of the right bank to avail the facilities of schools (one Kindergarten English School and a high school), health post, administrative and market centers located on the left bank of the river. The new bridge has not made any effect on the firewood and fodder collection activities.

Economic Impacts : As data were collected in a short period of time and bridges were constructed recently, we have assessed only the qualitative economic impacts of the bridges.

Saving in time and money : Table 2.2 below shows considerable traffic in all the three bridge sites[8/]. The traffic counts in these

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8/ The traffic estimation for the wet season (Asar - Bhadra) is based on EAST's traffic surveys for two days in September 1983, starting from 6 A.M. to 6 P.M. The traffic estimation for other seasons of the year is based on interviews with the local knowledgeable people.

three bridge sites present interesting findings. The Kokaha, a minor river has mostly 'through' traffic because it lies on a major trail; the Andhi Khola, a medium river has both local and 'through' traffic; and the Trisuli, a major river has mostly local traffic.

The delays in crossing each river before construction of the bridges are based on interviews with travellers during the traffic surveys as well as from the local people's experience. For Benighat East Consult's survey records for 1978 was used. Travellers crossing at Benighat in a ferry during the dry season had to wait on an average 15-20 minutes during dry season and one hour on an average in the wet season. An animal crossing in the wet season, on an average, was delayed up to a day. There was no way of avoiding this crossing point except by going down-stream or upstream making a detour of 5 to 6 kilometers. The crossing in these areas had 'twins' facilities each of which was equally risky in addition to being costly in time and money.

Over Andhi Khola, the new bridge was constructed close to the old bridge. Thus it has hardly effected the travellers' time for crossing the river.

The Kokaha Khola posed no problem in the dry season but in the wet season the river becomes turbulent. It is reported that sometimes the traffic has to wait for 1 to 3 days in the wet season, and the average waiting time was two days for the traffic. However, such a long delay occures only 3-4 times in a month.

Table - 2.2

Traffic in Kokaha, Gallyang and Benighat Bridges*

Name of the Bridge (River)	Trail Type	River Type	Traffic Type	Wet season (Average Daily Traffic)* 91 Days	Peak season (Average Daily Traffic)	Dry season (Average Daily Traffic	Annual Total Traffic	Annual Average Daily Traffic	% of Total Traffic
Kokaha (Kokaha Khola)	Major	Minor	Through	545	-	2,000	597,595	1,637	94
			Local	46	-	105	38,438	105	6
Gallyang (Andhi Khola)	Main	Medium	Through	85	1,250	600	211,135	578	47
			Local	392	1,250	600	239,072	655	53
Benighat (Trisuli)	Main	Major	Through	19	350	175	76,279	209	16
			Local	512	-	1,280	397,312	1,089	84

Source : EAST Consult's Field survey, September, 1983.

* Based on two-days' traffic count at each bridge site.

NOTE : Wet season : 3 months; Peak Season : 2 months for Gallyang and 5 months for Benighat;
Dry season : 7 months for Gallyang, 4 months for Benighat, and 9 months for Kokaha.

There was no means of avoiding this crossing point for the traffic of Bhojpur, Khotang and Diktel districts except by making a lengthy detour via Dharan - Dhankuta road. For this a traveller has to spent two additional days to reach Dharan Bazaar from these districts. Hardly any traveller will make such a long detour.

Although the Kokaha bridge has saved less time than the Benighat bridge, the Kokaha serves basically the through traffic whose economic importance is higher than that of Benighat as a whole. But Benighat has greatly facilitated the socio-economic mobility of the local people. The case study of these two bridges suggests that the trail and the type of river are both important factors for an understanding of the time saving. However, delay and time saving are difficult factors to calculate, thus a careful study is needed to determine whether a minor river like the Kokaha should be given a priority for bridge construction.

Along with the saving of time, the bridge has also saved money for travellers. Before the completion of a bridge, a traveller has to pay either ferry charges (in Trisuli) or pay a helper in crossing the river (in Kokaha). In the Kokaha river, the amount of toll used to depend on the condition of the river; sometimes a traveller had to pay up to rupees twenty per crossing! In Benighat a non-local traffic was charged rupee 0.50 for each crossing. The local traffic used to pay one pathi (2.5 Kilograms) of paddy annually per household. Today, there is no toll collection in all the three bridge sites. This has saved considerable amount of cash for the bridge users.

The other direct economic effect of the bridge is the establishment of small market centers close to the bridge. These market centers have shops which provide food and lodging and house some

retail stores. As informed by the locals 4 shops in Kokaha, 12 in Gallyang and, 14 shops in Benighat were all developed after the construction of bridge. These shops not only provide day-to-day consumer goods but also a new source of livelihood for some people. But it should be mentioned here that the opening of new shops at Gallyang cannot be solely attributed to the bridge since an old serviceable bridge was already existing.

In addition, some bridges have facilitated the transport of local domestic exports up to the market center. For example, an increased flow of commodities such as vegetables, milk, ghee, livestock, fruits and bamboo baskets up to the market center is reported in Benighat and Kokaha. The Benighat bridge is also instrumental for the stability and the regularity of food supply across the river. During the period of bridge construction, all the three bridges generated some local employment. The Benighat bridge has helped to provide people with short term local employment on the left side of the river.

Displacement of tradesman from their traditional jobs : In Benighat there is a group of people who are directly effected by the construction of the bridge where ferrying was the only means of crossing the river. These are the families of traditional ferrymen locally known as Botes. A total of 42 Bote households are reported in Benighat who were displaced from their traditional caste occupation, i.e. ferrying at the Trisuli river.

The Botes at Benighat are reported to have faced a serious subsistence problem. As their land holding is minimal, it cannot provide them adequate subsistence. In consequence, many of them have become labourers and some have turned into tenants of some landlords. Some have taken the jobs of portering and some sell

firewood regularly at Benighat bazaar. An adult male member of a household has migrated permanently to India and some male members of three households have also moved permanently to Chitwan. It is reported that some male members of other households are also preparing to move to Chitwan because of the better subsistence opportunities there[9/].

Institutional Impacts : The bridges have not had any substantial effect on the development of new service institutions or growth centers. Kokaha, Gallyang and Benighat were already developed as small growth points before the construction of new bridges. Although some tea stalls and retail stores have been established after the construction of the bridges, it is difficult here to assess the exclusive impacts of the bridges alone.

9/ A study of the displaced tradesmen was a sub-component of the USAID TSB - Project. The USAID awarded a contract to CNAS, T.U. for the study of these displaced tradesmen. The study had started and after the spending of nearly 25% of the budget, the USAID withdrew its contract on the ground that "the contractor had clearly demonstrated an inability to complete the subject study" (The USAID memorandum, dated December 17, 1981).

The terms of reference for the current study mention the question whether or not the lack of planned inputs such as 'study of displaced tradesmen' has hindered the project success. If the success of the project is to be measured in terms of the objective mentioned in the amplified discription of the TSB-Project Agreement, viz to upgrade the HMG/N's institutional capability to rationally improve the national bridge and trail net work', then non-completion of the displaced tradesmen study seems to have nothing to do with the project success. However, the overall contribution of the TSB-Project would have difinitely been better if a program to help in providing alternative employment opportunities or rehabilitation program of the affected 'Botes' (based on findings of such a study) had been implemented. Furthermore, the overall objective of the TSB-Project saying that it will 'enhance the quality of life of the rural population' has not been fully substantiated as a group of people has already been negatively effected by the project.

Environmental Impacts : It is difficult to generalize the problem of deforestation due to the construction of bridge alones. The supply of firewood and fodder in an area will increase along with the population growth; availability of a markets and the lack of other means of livelihood encourage the flow of these resources from one area to another. It can be said that in the Kokaha and Gallyang bridge sites, the local people still do not feel pressure of firewood and fodder and the bridges have not made any significant impact on the forests. On the others had, the excessive cutting of firewood and fodder seems to be a problem at Benighat. In Benighat, the bridge has facilitated the flow of these resource from the right bank to the left bank, a commercial center where firewood and fodder can be sold at a reasonably good price. The public forests at Benighat lie only on the right bank. It should be noted however that the flow of firewood towards Benighat had continued through ferry even before the construction of bridge though it was not as convenient as through the new bridge.

Overgrazing on either bank of the river due to bridge is not reported as a problem. The grazing area is no problem at Kokaha on either bank of the river. In Benighat, the bridge is hardly used for the grazing of livestock on either bank of the river. It can be said that overgrazing through the bridge is minimal in the study areas.

2.3 Conclusion :

It is difficult to generalize the impacts of the bridges and to derive a meaningful inference when the study is limited to three bridges only. It should also be mentioned here that the impact stud needs a longitudinal analysis whereas most of the bridges under study have been constructed recently. Furthermore, it is difficult to isolate the singular impact of the bridge from the effects of other developmental activities. This is particularly so in the stud areas as the development of Benighat and Gallyang bazaars and the

construction of the Prithivi Highway and the Sidhartha highway have changed partly the socio-economic pattern of the people living there. However, there is people derive immense socio - economic benefits from the construction of trail bridges and this has been well shown by EAST's study (1978).

The present study, nevertheless gathers interesting findings. Due to uniqueness of each bridge site surveyed, the degree of problem is different and so are their impacts. The bridges under study have shown mixed results; the socio-economic impact of a bridge varies from one site to another. For example, the Kokaha bridge serves few local people to enhance social activities and it has mostly served through traffic; the Gallyang bridge has little impact as a whole whereas Benighat bridge provides ample local benefits but serves little for the long-distance travellers. The economic benefits resulting from the bridge construction at Kokaha bridge which is located on the minor river, are considerable to the long-distance travellers though limited to the wet season. This is mainly because it is located on the major trail. But the new Gallyang bridge could produce little impact though it is located on the main trail. It is because an old suspension bridge was already providing service in the area and therefore the need for a new bridge was questionable. Benighat could render various government services and employments to the local people simply because of the location of the bridge. Except in Gallyang, the bridges have saved travellers' time and money, and the risk of life has been absolutely minimised in all three cases while crossing the river. In general, though the bridge itself has not improved much, the standard of living of the people, it has definitely helped to make the life the people easier, more secure and has enhanced greater socio - economic mobility in the area.

The construction of the Kokaha bridge is questionable. It is over a minor river which blocks the traffic only during the flash floods. Similarly, whether to construct a new bridge where an old bridge already exist is a question that should be carefull evaluated. The Gallyang example shows that an improvement of the existing bridge at a much lower cost could have provided similar services as the new bridge.

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CHAPTER 3 : CRITERIA FOR JUDICIOUS BRIDGE SITE SELECTION

CONSULT PVT. LTD.

CHAPTER - 3

CRITERIA FOR JUDICIOUS BRIDGE SITE SELECTION

3.1 Needs for Priority Ranking and Site Selection Criteria

The Suspension Bridge Division (SBD) has been always facing the problem of selecting sites for bridge construction because of a large number of requests. There are many hill districts in Nepal which badly need trail suspension bridges. A number of requests for construction, ranging from a few to even upto 20 or more, are received from each of these districts. There were a total 706 bridge requests received by the SBD from 61 districts of Nepal since last three years. In spite of the high priority given by the Government to the construction of Suspension Bridges in the Fifth and Sixth Five-Year Plans and the continuous growth of SBD activities during the past decade, it is currently able to completing only about 25 - 30 bridges annually. Obviously there is a need for screening out requests, for a judicious bridge site selection, and for priority ranking of construction in order to obtain maximum benefit for the people from the limited resources available to the SBD. Such a priority ranking is possible only if a set of appropriate criteria is used in the selection process which reflects the need and priority of the country.

3.2 Bridge Site Selection Process Until 1978

The need for judicious selection and priority ranking of suspension bridges had already been recognised by HMG in the mid-ninteen seventies. The Fifth Five Year Plan stated that detailed survey and feasibility study of about 60-70 trail suspension bridges will be completed within the plan period under the financing of UNDP[1/]. Accordingly, during 1975-76 feasibility studies of 66 bridges sites were

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1/ National Planning Commission, Fifth Plan (1975-80), Kathmandu, p. 389 (Nepali).

undertaken by the German Consult. The final report was submitted at the end of 1976[2/]. The study used a standard project feasibility approach of estimating economic and financial cost-benefits focusing on the user-time savings[3/] and found 42 of the surveyed sites worthy of further study and design. Half of these sites yielded economic IR of 10% and above. A priority ranking for construction was also prescribed by the study.

The study was, however, conducted by an external agency without involvement of the SBD. It did not contribute anything to the institutionalization of bridge site selection process within the SBD although many of the bridges found feasible by the study were ultimately constructed after 1978.

Until 1978 there was no systematic decision making process for the selection of bridges constructed by the SBD. Most bridges were constructed either in response to local demands backed up by influential personalities and/or pressure groups or under directives of the Royal Palace in response to petitions from the local people[4/]. Decisions to construct most of the bridges were, therefore, external to the SBD and the latter acted primarily as an agency for technical surveys and implementation.

2/ German Consult, Trail Suspension Bridge Study, Vols. 1 to 4, HMG/Nepal and IBRD, Germany, (no date).

3/ We have reservation about the use of such an approach for a projedt like suspension bridges which, besides their economic importance, have immense social and political significance.

4/ East Consulting Engineers, Trail Suspension Bridge Study, conducted for USAID Nepal, Kathmandu, June 1978, p. 35.

In 1978 SBD-SATA introduced a check list and guidelines for bridge site surveys (see section 3.4.1 & 3.4.2)[5/]. The check list however did not provide specific guidelines which could be used for feasibility-assessment or priority ranking of the surveyed sites. The socio-economic feasibility of a particular site was determined completely by the subjective judgement of the individual surveyors.

3.3 USAID's Attempt to Introduce Objective Site Selection Criteria

Background : USAID has been involved in the financing and construction of trail suspension bridges in Nepal since 1958. Until 1975 a total of 23 bridges were constructed with USAID support. The USAID, wishing to finance the construction of more trail bridges in Nepal, decided in 1977 to carry out an impact study of some of the bridges constructed until 1975. The ultimate objective of the study was to develop criteria for future bridge site selection on the basis of the evaluation of socio-economic effects on the people served by the bridges. The study was undertaken by the East Consulting Engineers and a final report based on the survey of 13 completed bridges was submitted in June 1978.

5/ SATA involvement in suspension bridge construction dates back to 1971 and to date substantial aid has been received from the Swiss Government. A team of Swiss engineers has been working with the SBD and they have contributed significantly to upgrading the technical capability of the SBD. Following an aid agreement between HMG and SATA in 1977, the suspension bridge construction activities are now jointly managed by SBD-SATA.

The study found that a bridge location, if appropriately selected, contributes many social and economic benefits to the people served[6/]. However, it is difficult to come up with a thoroughly objective and accurate system for the selection and ranking of the bridges in a priority order of 1,2,3, etc. Conside the institutional arrangement for resource allocation within the country the study suggested a systematic selection process and pr allocation for bridges at different levels -- the district level, SBD level, and the Local Development Department level (now convert into the ministry of Panchayat and Local Development)[7/].

The Project Paper Socio-Economic Ranking Criteria and its Refinement : Based upon the various benefits identified by the Ea Consult Study, the USAID developed a set of objective site selecti and ranking criteria. The criteria were included as an integral pa of the Project Paper (PP) developed under the TSB-Project Agreemen between HMG and the USAID. Application of the PP criteria "for all the potential bridge sites to be considered for AID financing" was a pre-condition for release of funds under Section 4.3 of the Gran Agreement

The emphasis given by USAID to the use of PP criteria is evi from the following extract from the amplified TSB-Project Agreemen

> "The Trail Suspension Bridge Project represents a collaborative effort between HMG/N and AID to upgrade the HMG/N's institutional capacity to rationally improve the national bridge and trail network. Achievement of this purpose will be based on a process of surveying and ranking of potential bridge sites prior to final selection, design and constructi of bridges by the Department of Roads. The initial designs o

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6/ See East Consulting Engineers, Trail Suspension Bridge Study Vol. I, op. cit. pp 29-34.

7/ Ibid, see pp 48 - 53 for details.

this ranking and surveying procedure are outlined in the Project Paper. It is this initial design that will by utilised by the Department of Roads, during the analysis of potential bridges which are to be financed by AID. Such a procedure, it is understood, will be further refined and developed during the life of the project with the aim of incorporating them eventually into the standard operational procedure of the Department of Roads".

The PP criteria specified 12 factors, under three major categories, each of which was assigned more or less arbitrary weights (see Table.3.1)[8/]. The weights were to be applied to the observed values of the factors in each bridge site surveyed and priority ranking was to be based upon the total scores obtained. The USAID initiated a study to field test the criteria on ten bridge sites and to prepare a field survey manual in November 1979. The study, assigned to East Consult, was completed in July 1980. It suggested some changes in the specification of factors, their definitions, and factor weights and, with concurrence of USAID, prescribed a refined list of 13 criteria (see Table 3.1). The study also demonstrated that ranking based on these factors is possible[9/].

8/ USAID, Project Paper Nepal: Trail Suspension Bridges(367-0119), Kathmandu, August 31, 1979 see pp. 39 - 54 for details. Comments on the appropriateness of the PP criteria (and subsequent refinements) will be made in Section 3.6.

9/ This does not necessarily justify the appropriateness of the criteria for judicious site selection (see section 3.6).

The study also prepared a draft survey manual with specification of the primary and secondary data needs and their collection methods, questionnaire format, and standardized method of computing the ranking scores. On September 5, 1980 a one-day instruction course on the use of survey manual was given to 30 members of the SBD's technical staff and on September 7, 1980 a field training program was conducted at Benighat Bridge site. Subsequently the manual was finalized and a consolidated report of the study was submitted to USAID in November 1980.[10/] It was emphasized in the study as well as in the training program that the manual was open to changes, and if necessary, changes could be introduced by the SBD on the basis of experiences gained in the field.

Table 3.1: The Project Paper Socio-Economic Ranking Criteria and Refinements after Test Ranking Study.

Criteria	Original Weight	Revised Weight
A. Economic Factors	(0.65)	(0.50)
1. Cost	0.25	0.20
2. Time saving for/Volume of through traffic*	0.25	0.15
3. Local Production of Food Crops	0.10	0.10
4. Major Local Exports	0.05	0.05
B. Social Factors	(0.20)	(0.30)
5. Local Population Served	0.05	0.10
6. Improved access to/presence of health facilities*	0.05	0.06
7. Improved access to/presence of educational facilities*	0.05	0.06
8. Improved access to/presence of administrative facilities*	0.05	0.08

10/ East Consulting Engineers, A Consolidated Final Report on Survey and Priority Ranking of Ten Trail Bridges, conducted for USAID-Nepal, Kathmandu, November 1980.

Contd. Table 3.1

Criteria	Original Weight	Revised Weight
C. Other Factors	(0.15)	(0.20)
9. Accident Prevention/Risk factor*	0.05	0.04
10. Local support of the Project	0.05	0.04
11. Presence of Integrated Rural Development Program	0.02	0.02
12. Type of river*	-	0.08
13. Presence of the main trail*	-	0.02
14. Land ownership**	0.03	-

* Definition revised or factors added after Test Ranking study.

** Found irrelevant after Test Ranking and dropped in the refined criteria.

Source: East Consulting Engineers, A consolidated Final Report on Survey and Priority Ranking of Ten Trail Bridges, conducted for USAID- Nepal, Kathmandu, November 1980.

Reasons for Non-application of the PP Criteria : In spite of the attempt of the USAID to introduce the socio-economic site selection and ranking criteria and the fact that it was incorporated as a pre-condition for release of funds under the TSB - Project Agreement, it has never been used by the SBD. We have identified five basic reasons for this.

1. Lack of 'will' and commitment of the SBD : The reasons often mentioned by the SBD officials for non-application of the criteria are :

   - lack of appropriate staff;
   - long time required to complete the detailed surveys;
   - such surveys are expensive;
   - they are too sophisticated.

   These reasons are valid to some extent but do not present a convincing agreement. Given the 'will' these problems can easily be solved or the criteria could be modified as suitable. But the SBD never tried to institute the criteria as part of their decision making process and, more importantly, our interviews with the officials reveal that they were never convinced about appropriateness or utility.

   The commitment of the SBD could have been ensured if the USAID had effectively involved the SBD decision makers in the inception, development, and testing of the selection and ranking criteria; in the process, perhaps, a more realistic and appropriate selection process acceptable to the SBD could have been developed. No doubt the SBD was consulted and it 'participated' in meetings relating to the development of the criteria. Since the TSB-Project Agreement included the use of criteria as a pre-condition for fund release, the SBD engineers and overseers even participated in the training course. During the discussions in the training

course the then SBD Chief even declared SBD's commitment to use them, But in practice SBD's participation was rather perfunctory than real. In spite of the stated commitment they remained passive and did not suggest any constructive changes in the set of criteria, nor did they attempt to test the criteria in actual field condition. We feel that the SBD is responsible for this resistance to change but USAID is also partly responsible for not trying hard enough to involve the SBD officials in the process of development of the criteria.

- <u>SATA's Reluctance to Introduce the Change</u> : When the USAID signed the TSB-Project Agreement with HMG, SATA was jointly managing the SBD. As a major donor for the suspension bridge program of HMG, it had a decisive say in each major issue related to the SBD. The USAID rightly attempted to involve the SATA experts in the development of the PP criteria and there seems to have been some participation of and feed back from the latter. However, for some reasons that we were unable to ascertain, SATA counterparts in the SBD were not-receptive to the idea of using the PP criteria. The current SATA Project Chief in the SBD feels that the criteria are too 'sophisticated' & requisite information is difficult to collect. (These are expressions that indicate lack of 'will to implement rather than inappropriateness of or practical difficulty in

using the criteria)[11/]. Since SATA effectively controlled SBD policies, the later was unable to introduce the criteria.

3. Foreshadowing of the purpose by the Expediency of Bridge Construction : In spite of '1' and '2' above, the USAID could have insisted on the application of the PP criteria for site selection since release of project funds was conditional upon it. But the necessary time phasing of surveys at least one year before construction of bridges did not allow for such insistence. Although the PP mentions:

11/ Since the SBD never used the PP criteria systematically its real drawbacks in practice are not know. Only in two 900 series bridges -- Ghopatar and Raighat -- has the SBD used them during the resurvey. The comments of the surveyor of the two bridges were that "it takes about 10 days to complete the survey and each survey costs around Rs.10,000". In addition, it is mentioned that evaluation of criteria number 3 (Local Production of Food Crops) and number 4 (Major Local Exports) can be undertaken only by an economist. The rest of the assessment can be done by the SBD technician. Looking through the survey report our impression is that the surveyor has not really understood how the information is to be collected for the evaluation of criteria number 3 & 4 (he was not among the staff who took the course on the method of using the survey manual). All production figures for criterion No. 3 were supposed to be obtained from secondary sources whereas the surveyor had attempted to collect it from local source; similarly he was probably unaware of the technique of soliciting information for criterion 4. This only indicates the need for training which is a must for the surveyors. The requirement of excessive time and cost also reflects lack of understanding of the information collection technique. The surveyors are not expected to go from village to village for collecting information, which seems to have been attempted in this case. The difficulties in using the criteria can be easily overcome with short training and with the experience gained from their use through time.

"a ranking system for the suspension bridge has been developed which is sufficiently comprehensive to serve as a final site selection procedure rather than simply an initial screening device" the criteria had never been tested in practice. The USAID opted to field-test the criteria and prepare the survey manual which was completed only in November 1980, more than a year after the signing of the Project Agreement. Therefore USAID was compelled to waive in practice section 4.3 of the Agreement (Relating to the application of the PP criteria for release of funds) for construction of bridges under its grant in Fy 1979/80. Ten 700 series bridges were approved for USAID funding on February 4, 1980. Also eight 800 series bridges for construction in FY 1980/81 were approved on January 12, 1981 without the application of the PP criteria simply because there was no time to undertake the surveys. USAID simply could not afford to delay bridge construction by sticking to the use of PP criteria.

4. Laxity in Enforcement : Having approved bridge construction for the first two years of the three year Project Agreement USAID seems to have lost interest in strictly pursuing the application of the PP criteria. Whichever bridges the SBD proposed for USAID funding, the latter simply approved. Therefore, eleven 900 series bridges for FY 1982/83 were approved on March 16, 1982 without any mention of the condition laid down in section 4.3 of the Agreement.

The internal memorandum of USAID to get the approval for the project extension for one year (From September 1982 to June 1983) also seems to misrepresent the issue relating to the PP criteria. The USAID could not be unaware of the reluctance of the SBD to use the suggested ranking scheme. Yet the project extension memorandum dated April 5, 1982 states : "a major

accomplishment of the project has been the development of the site selection criteria". Further, it states: "if the project is extended, the criteria will be utilized in the selection of new bridges..... The extension perioc would provide the time and opportunity to evaluate, adopt, and incorporate the criteria into the selection of sites by the SBD". In spite of these statements twelve 1000 series bridges were approved which were selected without the use of the PP criteria.

5. Conceptual Drawback : There was a conceptual drawback on th whole idea of introducing the PP criteria only for the brid to be funded by the USAID. Of course, the implied and ultim objective was to institutionalize the process for all bridg site selection to be constructed under the SBD. But this wo not have been possible for SATA assisted projects (i.e. all the other bridges to be constructed by the SBD) without the cooperation. The conceptual drawback is that there is no rationale in using the PP criteria in only a subset of the total bridge projects of the SBD. Ranking necessarily means that there are a large number of potential bridge sites and only the most feasible are to be undertaken for construction Once the major part of the set is excluded judicious site selection cannot be said to have been made.

In spite of this drawback a beginning could have been made by the use of the criteria on the USAID funded bridges and thus practical difficulties in the use and appropriateness of the criteria could have been assessed. But such an opportunity was lost because of the SBD's non-receptive attitude.

6. Policy of one Bridge for one Hill District : The policy of the government as stated by the SBD officials, is that at least one suspension bridge is to be constructed in each hill district of the country for political equity. The study team was, however, not able to locate any written documentation to this effect and, therefore, this seems to be an implicit policy followed to accomodate political pressures. Pursuance of this policy in effect makes the need for any ranking system redundant. The SBD officials state that this was one of the reasons for not using the proposed criteria. It is, however, our opinion that such a policy is inappropriate for an institution like the SBD which is assigned with the responsibility of implementing national level projects. If this was to be the policy to be pursued the SBD should have informed the USAID officials during when the PP criteria and the ranking scheme was being deliberated upon. However no records are available which shows that SBD had provided such information to USAID.

3.4 Current Methods of Site Selection and Its Evaluation

Current Method of Selection : The general site selection process currently used in the SBD is as follows. Bridge construction requests are received annually from the Jilla Sabha (District Assembly) of each of the 56 hill districts. Since last year (FY 1982-83), SBD has requested all District Panchayats to submit their requests in a standard format and in order of priority as determined by the Jilla Sabha. Upon receipt of such requests only the top few bridges are given consideration. Even then the process ends up with more than 100 bridges out of which a selection must be made for assessing the feasibility and inclusion in the program for construction in the next fiscal year. In principle, the main

considerations for eligibility are: location in the main trail and bridge span of more than 50 meters; and districtwise equity in allocation of resources. Districts where no bridges are under construction or immediately planned for construction are usually given first priority. In this way a manageable short list, usually containing a number not exceeding the SBD's capability is prepared Information and maps existing with the SBD on the requested sites, if available, are used to prepare such a short list. The SBD nevertheless has to give lot of consideration to political pressure in preparation of such a short list.

The next step is to send survey teams to the sites. The standard check list introduced in 1978 is used for the survey. Besides technical details, the check list requires :

- sketching of the area influenced by the bridge;
- identification of distances to nearest road heads, airstrip, wireless station, and post office;
- enquiry about planned road/airstrip in the near future;
- traffic count for at least one day and collection of information from local people on seasonal traffic variation;
- classification and discription of the river;
- identification of alternative crossing facilities;
- if a local bridge already exists at the proposed site, description, present condition and sketches of the bridge.

Instruction for collection of these kinds of information is given in the "bridge survey guidelines"[12/].

Based on these bits of information, the survey in-charge is to decide on the spot according to his personal opinion whether the bridge is feasible or not. If deemed feasible, technical survey is carried out by the same survey crew.

Evaluation : The policy of constructing bridges located in the main trail is justifiable both from the perspective of national priority as well as the limited capability of the SBD. However, the SBD has not attempted to precisely define the term 'main trail'. As a result, it is subject to flexible interpretation by the SBD staff as well as the pressure groups. Consquently, several low priority bridges have been constructed. For example, 36% of the bridges constructed during the last 4 years are located in subsidiary trails and 10% are on minor rivers (see Annex 3.1 to Chapter 3).

Moreover, even if the term 'main trail' was defined precisely, the SBD would be unable to follow this principle strictly because of the additional criterion of districtwise equity in resource allocation. Not all bridges requested as being in top priority by District Panchayats are located in main trails. This principle was followed from the practical considerations of accomodating political pressures that the SBD used to face and to

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12/ HMG and SATA, Bridge Survey Guidelines, Kathmandu, March 1978.

a large extent, is till facing. Equity consideration is unavoidab in any selection process and should certainly form a part of the selection criteria. The national policy of balanced regional development also justifies equitable resource allocation but the emphasis on districtwise equity is certainly misplaced in view of SBD's limited capability. Also the strategy of regional developme cannot be fulfilled by simply dispersing resources in each and every district forming the region. It needs an integrated approac in resource allocation within the region which might override district level equity consideration. For example, if there are many bridge to be constructed in the major trails linking the region, allocations to some districts within it may have to be given low priority.

The process of ascertaining feasibility of individual site is also unsatisfactory. Although information about area of influence, existing and alternate access, type of river, and the like is required to be collected through the use of a good check list, there is no clear basis specified as to enable one to decide whether a bridge is feasible or not. Traffic count is required but only as a ritual. The decision is, therefore, completely subjective and dependent upon the personal judgement of the site survey in-charge. Consequently, the survey in-charge faces intense local pressures usually difficult to ignore. Except on technical grounds not a single survey undertaken by the SBD so far has determined the bridge site as "unfeasible" from the socio-economic consideration. Obviously such a process cannot assure judicious selection, nor can it provide information for priority ranking. After the surveyors return to Kathmandu there is no clearcut process as to how priority ranking is to be done. Personal judgements play the decisive role in selecting bridges for final design and construction.

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In conclusion it can be said that judicious siting of bridges cannot be ensured in the way that selection and surveys are currently carried out. Given the national needs and priority as well as practical considerations the overall system is quite appropriate but there is a need for improvements (see section 3.7 for recommendations).

3.5 Plan for Preparation of Trail System and Bridge Network Map

Appropriate siting of bridges and judicious priority ranking could be ensured to a large extent if a comprehensive map of the Trail System and Bridges Network within the country exists. Such a map with detailed classification of the regional access (major) trails, main trails, and subsidiary trails could not only be useful for priority selection in a given year but could also facilitate the SBD's maintenance programme and the preparation of long term plans in coordination with the trail improvements and road construction plan within the country. In view of the need and utility of such a map the TSB-Project Agreement included preparation of a "National Trail Classification Map and Study" as one of the subcomponents for which US $ 25,000 was appropriated. Unfortunately, this important component was not implemented.

The USAID had expected to get the trail classification map project completed by an independent contractor. Services of a cartographer from the USAID (U.S. Dept. of Agriculture) Forestry Service were made available by the USAID for two weeks during February 1980 to prepare a detailed proposal based on a field visit to Nepal. But the expert estimated that the total cost for completion of the project would be between $ 600,000 and $ 1,000,000 and would take about 4 years for completion. The project was officially deleted in August 1980 on the ground that the expected cost has "proven to be prohibitive". The remaining fund on this account was allocated to the bridge construction program.

It is commendable that USAID has rightly realized the need and utility of such a map and included it as part of the project agreement. But the decision to delete the project solely on the ground of high cost was a mistake. It seems that the USAID took a 'perfectionist' policy to prepare a highly accurate map with identification of the 1st, 2nd, and 3rd level trails based on up-to-date Aerial Photographs and field checking. The capability of preparing such a map through the cooperation of existing government agencies or the possibility of getting it prepared by a local private consultant was never explored which could have reduced the cost significantly.[13/] It was taken for granted that the work was beyond the capability of the Nepalese. The USAID accepted on face value the observations and suggestions of a foreign expert, who was presumably visualizing the precision of the work as well as the expected costs to be comparable to the US standard.

What the SBD needs is not a precise identification of major (regional access), main and subsidiary trails and existing bridges thereof but a map showing fairly good approximation of these. To start with, identification of the major and, if possible, the main trails would have been enough. Even without recourse to the recent aerial photographs, a concerted effort by a government agency (such as the National Population Census Mapping Project or even the SBD) in collaboration with local private consultants could have been made to pull together all the existing information supplemented by extensive field checking and a workable map could have been produced at a reasonable cost. This could have been continuously updated and corrected by the SBD as and when new information was available.

13/ There was some effort made to get a trail map prepared by local consultants by the SATA after the USAID dicided to delete this project. In response to a call from the SATA, East Consulting Engineers had submitted a detailed proposal involving a total cost of US $ 68,000 only and a project completion period of two years.

The idea of trail and bridge network mapping has now revived in the SBD. The SATA was prepared to finance it last year but the project was postponed because the Swiss Funding did not materialize. The Planning Commission and the SBD are, in principle, committed to this idea although a detailed proposal has not yet been prepared. Rs.200,000 has been appropriated in the proposed budget for FY 1983-84 for the mapping project irrespective of whether SATA is willing to fund it or not. Our interview with the SATA officials also indicates their enthusiasm and most probably they will fund a substantial cost of the project. A Swiss Engineer with cartographic background is expected next January for this purpose. The project is planned to be completed within three years.

In conclusion, the lack of the planned input of the "National Trail Classification Map", as envisaged under the TSB-Project Agreement, has certainly hindered the institutionalization of site selection process within the SBD. It is fortunate that the SBD has realized its importance and is now planning to go ahead with the mapping project.

3.6 Review of the PP Criteria

"Given the large number of discrete sub - projects involved in the trail suspension bridge project and the desire to take social benefits into account, standard quantitative analysis which compares alternative projects in terms of present value, rate of return or other similar measures, is neither financially, nor technically feasible. The project selection procedure

which has been devised for the suspension bridge program minimizes these problems by focusing on a set of factors which are easier to measure, and can be expected to correlate with the ultimate economic and social benefits being sought. In addition to the advantage of expediency, the procedure which has been developed also affords an advantage of flexibility since it makes it possible to take into account factors of an intangible and qualitative nature which would remain outside the scope of normal quantitative analysis".

We do endorse that the standard quantitative analysis is not suitable for evaluating feasibility of STB's in Nepal. However the objective criteria proposed by the USAID also have the followi drawbacks.

1. <u>The proposed criteria do not fully incorporate national need and priority</u> : The SBD is a central government institution responsible for implementing central level projects, i.e. project of non-local characteristics[14/]. It lacks resources and technical capability to undertake a large number of projects in a given year whereas there are still major and main trails in Nepal that need construction of a large number of suspension bridges in order to make them serviceable throughout the year. Thus the immediate need and priority of an institution like the SBD is to construct bridges on the major and main trails. Moreover, HMG is committed to the balanced regional development strategy which means that regional equity should be reflected in resource allocation.

14/ The technical Division of MPLD is responsible for implementi projects for bridges of local characteristics.

These factors have not been incorporated in the PP criteria. Regional equity could be easily taken care of by pre-allocation of funds to various regions[15/] but priority to bridges located in major and main trails must be the basic criterion for site selection. If the criteria were used blindly there is every possibility that the SBD might end up constructing a number of bridges in subsidiary trails and that resource allocation may be concentrated into certain parts of the country.

2. Compromise of conceptual logic for expediency : The Project Paper criteria is certainly easier to use and flexible in the sense of mechanically incorporating intangible and qualitative factors. However it assigns arbitrary weights to heterogeneous factors that have different measurement units and, therefore, conceptually difficult to justify. Since there is no objective basis for assigning the weights the 'objective' criteria easily turn into a set of standardized subjective values. For example, the developer of the original PP criteria had assigned different weights to each criterion whereas this was significantly altered by the experts responsible for test ranking the original criteria (see Table 3.1). The alternation however, was based on subjective value judgement of the experts and not on certain objective grounds. Ranking of a set of bridges using these two sets of criteria would produce different results.

In the absence of a better alternative, recource to 'judicious' assignment of weight is suggested even by the World Bank for

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15/ Equity for remote areas has been considered indirectly by ignoring transportation cost from the 'cost of bridge construction'. But this does not assure equity to the five development regions. However, East's test ranking study has clearly mentioned this "a regional consideration should achieve an advance parcelling of resources, following which interregional priority ranking should be undertaken" (See "A consodilated final report" East Consulting Engineer Nov. 1980 pp 72).

priority ranking of projects[16/]. But one should relize that this is simply an expediency measure. We do believe that use of the refined PP criteria would have certainly simplied the decision process within the SBD and that to a large extent political pressures could have been resisted since it would have been easier for the SBD officials to ward off such pressures by refering to the 'objective' selection and ranking method. But to what extent use of such criteria would have resulted in judicious site selection is questionable. The SBD could have, of course, continuously improved upon them but given the heterogeneous factors to be considered objective basis for such improvement would still be lacking. Considering SBD's resources and national priority we prefer a more systematic and practical method of selection (see section 3.7).

3. Blind application of the criteria may also lead to priority consideration for certain sites which may not really need a new bridge. For example, the East Consult Study undertaken for the survey and priority ranking of ten trail bridges in 1980 came out with a 'sixth' priority ranking with a score of 32.56 for Nibua Banchare Bridge in Dhankuta out of ten bridge sites studied. A careful look at the individual scores of the various factors indicates that construction of the bridge contributes nothing to time savings, to improved access to health facilities, to educational facilities, to administrative facilities, and to accident prevention. Obviously, there exists a bridge which is safe and serviceable. In such a situation it is necessary that a decision must first be made as to whether a new bridge is really necessary. In many cases improvement of the existing bridge can save unnecessary investment of the scarce resources.

16/ IBRD, The Economic Analysis of Rural Road Project, Staff Working Paper No. 241, Washington D.C., August 1976, Annex 3.

In conclusion, it should be mentioned that the USAID's attempt to introduce objective and 'judicious' site selection criteria was well intended. However, for reasons mentioned above as well as considering the SBD's capability we do not endorse its reintroduction. Instead, in the following section, we suggest improvement in the existing system which would be a more appropriate and practical method of institutionalizing the selection process in the SBD.

3.7 Conclusion and Recommendations

Although a fairly appropriate 'system' of screening demands for bridge construction exists in the SBD, there is a lack of reliable information, of a good trail network map, and of a systematic procedure and guidelines for priority ranking based on which a judicious selection of bridge sites could be ensured. As a result, site selection is currently subject to personal judgement of the SBD officials and to political pressures. Attempts to introduce 'objective' socio-economic ranking criteria by the USAID were not successful due to various reasons and based on the reveiw of the PP criteria in the preceding section we do not endorse its reinstitution. Nevertheless, demands being far in excess of the SBD's capability to meet, the current selection process must be improved if, given the national priority and needs, maximum return is to be obtained from the investment of scarce resources. We recommend the following for evaluation and priority ranking of future bridge construction programs of the SBD.[17/] Institutionalization of the procedure will also be easier since the recommendations aim at improving the existing system rather than replacing it.

17/ Most of these recommendations are based on East Consult's Trail Suspension Bridge Study, June 1978 which had suggested a rational and practical procedure in line with the existing institutional system of resource allocation within the country (see pp. 43 to 53).

1. The current method of soliciting bridge requests from the District Assembly with indicated priority should be continued. This will not only lighten work load for screening the long list of demands at the national level but to some extent also involve popular participation in demand generation.

2. The total annual budget of the SBD should be appropriated to the five Development Regions in line with the national priority. This would indicate the approximate number of bridges that could be constructed within each development region.

3. A coordination committee consisting of the officials from the SBD and from the Technical Division of the Ministry of Panchayat and Local Development (MPLD) should be formulated to review the bridge request lists before the beginning of the fiscal year. Only top two bridges requested by each district should be included in the list eligible for survey and construction. The SBD should be made responsible for construction of bridges located on the 'major' (regional access) and 'main' trails only and a precise definition of these should be laid out[18/]. On this basis the coordination committee should prepare a short-list of bridges that the SBD should consider for survey and construction[19/]. The

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18/ See East Consulting Engineers, Trail Suspension Bridge Study, Vol. I, 1978, appendix D-A.4 for Indicative classification of Trails. Based on this a tentative working definition can be prepared immediately. The precise definition should, perhaps, wait until the planned Trails & Bridges Network Map Study is completed.

19/ Since some of the priority bridges requested by District Panchayats might be located in subsidiary trails consideration for financing construction of such bridges should be made by the Technical Division of the MPLD.

committee should also acquire or avail itself of road construction plans of the Department of Roads and avoid bridge construction in areas where road links are planned in the immediate future.

4. This would provide a short list of bridges ranging from about 20 to 25 in each development region out of which the SBD needs to make a final choice.

5. First priority for survey and construction should be given to bridges located on the major trail (or regional access trail) within the Development Region. Since such trails are more or less identified within existing maps this should not pose a problem.

6. Survey teams should then be sent to the sites. The main function of the survey team would be to identify first whether there is a need for a bridge in the requested site or not (e.g. existing bridge may be possible to be improved with little investment). Until the National Trail and Bridge Network map is prepared a traffic count at the survey site should be made for at least three days and information on seasonal variation in traffic should be obtained from local informants. The existing SBD-SATA check list can be used for this purpose. If the survey-in-charge determines that the requested site is indeed located in the major or main trail and if existing crossing facility is inadequate, then the detailed technical survey should be undertaken[20/]. Decision criteria to determine inadequacy of crossing facility, as precise as possible, should be prepared by the SBD.

20/ For example, the existing bridge may be unsafe and not economical to improve or the river/stream may be fordable in dry season but swells up and remains unfordable for an extended period during wet season.

7. After completion of survey in all potential sites priority ranking within each development region should be done by the SBD in Kathmandu. Following guidelines are suggested :

i. Top priorities to bridges located in major trails and lower priorities to those located in main trails.

ii. Within each category of 'major' and 'main' trails higher priority to sites with larger volume of traffic;

iii. Within each category of 'major' and 'main' trails, priority should be given to major river followed by medium and minor rivers[21].

iv. Do not consider cost factor at all if it lies within a certain fixed range[22] (say below Rs. 1.5 million; 30 out of 41 bridges under USAID funded TSB-Project involved costs less then Rs.1.5 million). There is no objective basis to suggest such a range but average costs of bridges constructed within the last 2-3 years could be taken as an indicator. Beyond the fixed range, judgement of the SBD officials based on supplemental information should prevail. For example, even if a bridge is expected to be relatively expensive it may be vital to keep the supply line open throughout the year in the region. Only informed judgements can help for judicious selection in such cases.

21/ See East Consult, Trail Suspension Bridge, 1978, Vol. I Appendix O-A-5 for indicative classification of rivers.

22/ This is justified on the ground that a safe and round-the-year serviceable network of major trails in the country is a basic need from political and social point of view. Moreover, it is necessary to keep the supply lines open to the hill areas.

8. Detail bridge design should be prepared for only the number of bridges that can be undertaken for the next year within each development region. Low priority bridges from among the ones surveyed should form part of the list for reconsideration in the subsequent years.

9. High priority should be given to the completion of the proposed National Trail and Bridge Network mapping. A master plan for the gradual improvement of the trail and bridge system in the country should be prepared from such a map. Once such a master plan with annual construction priority and plan is prepared the need for socio-economic feasibility surveys and priority ranking will no more be necessary.

10. We also recommend that ultimately planning, implementation and improvement of the national trail network should be combined with the suspension bridge construction activities. This would need concentration of these functions and responsibilities in a single institution. We endorse the ploicy stated in the Sixth Plan Document that the SBD should be upgraded into a Department and entrusted with these functions.[23/]

23/ See NPC, Sixth Plan, Vol. I, Kathmandu 1980, p. 370 (in Nepali).

Annex 3.1 to Chapter 3

Table 1: Location of Bridges according to Trail Type (1979-1983)

Development Regions		Main Trail	Subsidiary Trail	Total Bridges
Eastern	D.R.	11	14	25
Central	D.R.	15	11	26
Western	D.R.	17	9	26
Mid Western	D.R.	16	2	18
Far Western	D.R.	9	1	10
Total		68	37	105
% of the Total		64.76	35.23	100.00

D.R. : Development Region.

Source: SBD

Table 2: Location of Bridges according to River Type (1979 - 1983)

Development Regions		Minor River	Medium River	Major River	Total Bridges
Eastern	D.R.	2	17	6	25
Central	D.R.	3	12	11	26
Western	D.R.	x	12	14	26
Mid Western	D.R.	1	x	17	18
Far Western	D.R.	4	2	4	10
Total :		10	43	52	105
% of the Total		9.52	40.95	49.53	100.00

Source : SBD.

CHAPTER - 4

EVALUATION OF THE FISCAL PROCEDURE

4.1 Procedure Agreed with the USAID for Release of Grant Funds

Conditions for Release of Funds : Out of the total grant of US $ 3,000,00 the TSB Project Agreement appropriates US $2,600,000 for the following costs associated with the construction of suspension bridges to be approved for funding by the USAID[1/].

- The procurement of steel cable, cement, and other imported materials;
- fabrication of steel components used in the bridges;
- transportation of materials to construction sites.

The HMG inputs were to be the costs of construction contracts, provision of the technical and field personnel, administration, and operational and maintenance support.

Prior to the release of funds the agreement laid down the condition that the socio-economic ranking of HMG/N proposed bridge sites will be taken into consideration in the selection of bridges to be financed by the Grant, and that a plan has been developed to incorporate the use of these criteria during all subsequent HMG/N surveying of potential bridge sites to be considered for AID financing under the Grant (section 4.3).

1/ Subsequently, unspent funds of about US $ 253,000 from the deleted sub-components of the TSB-Project (displaced tradesmen's study and trail network map classification study) was transferred to bridge construction account.

Release of local currency costs was to be on a reimbursement basis upon submitting a satisfactory evidence that "Contracting and tendering procedures acceptable to AID have been followed"(section 4.5). Release of foreign exchange costs were to be made either by reimbursement, cash advances, procurement by USAID on behalf of HMG, or committment by USAID on HMG's behalf to third parties.

The conditions for release of funds were subject to change upon mutual agreement of HMG and USAID.

Brief Review of Actual Fund Release Process : For reasons discussed in Chapter 3, the condition laid down in section 4.3 of the agreement relating to the use of PP criteria for site selection prior to release of funds was never followed strictly. Bulk of the cables required for the project funded bridge were procured directly by the USAID from India through the mutually agreed upon tender procedure.

In order to obtain release under the grant, the SBD was first required to submit a list of suspension bridges proposed for AID funding. The proposal included expected total costs disaggregated into major heads including expected financial obligations of HMG and the USAID; after necessary review and upon approval by the USAID commitment of funding under the Grant is secured. For fiscal year 1979/80 the USAID approved funding of 10 STBs (700 series) in February 1980. A reimbursement process of funding was instituted in the beginning of the project. Ths SBD was to submit an actual statement of expenses for the approved bridges with necessary documentation which would then be reimbursed by the USAID. However, it was soon realised that this procedure posed serious problems in timely implementation of the project since the SBD lacked working capital which was accentuated by its inability to submit promptly statements of expenditure for money already spent. Considering this difficulty almost all the funds required for the 700 series bridges were actually released in advance.

The problems associated with the reimbursement system were discussed in detail in a meeting of USAID, SBD and SATA officials on June 4, 1980. The following procedures were agreed upon for financing of bridges for fiscal year 1980/81.

1. The SBD is to submit to USAID early in FY 81 a completed package consisting of designs, plans and cost estimates of bridges to be financed by USAID.

2. The SBD is to submit to USAID a financial plan indicating approximate dates when financing is required for payments to various contractors and these financial projections are to be transposed into a plan giving quarterly requirements for project financing.

3. Based on these financial projections, USAID will process the release well in advance of the actual required date so as to ensure that such money reaches the SBD when required.

4. The SBD will submit quarterly statements of expenditures to USAID on a timely and regular basis and every effort will be made to clear all the advances as early as possible.

5. USAID releases made subsequent to the second quarter of FY 80/81 will be subject to SBD's ability to clear the outstanding advances made by USAID to the project during FY 79/80.

The advance system thus instituted continued for the project funding during FY 1980/81 (for eight, 800 series bridges) and during FY 1981/82 (for eleven, 900 series bridges). However, the SBD was consistently behind schedule in submitting the required statements of expenses for the advances released for

the 700, 800 and 900 series bridges. Some of the reasons were beyond SBD's control but basically it was due to its poor financial management (see section 4.3).

By the end of March 1982 there was a substantial amount of unutilized project fund. Since the project agreement completion date was August 1982, extension of the project was made up to June 30, 1983 in order to utilize the unused Grant amount of over US $ 550,000. Twelve 1000 series bridges were approved for funding until the extended project completion date. Because there was still a substantial amount of advances for which statements of expenses were yet to be received by the USAID, the reimbursement system was reinstituted for financing of 1000 series bridges.

As per the record of the USAID (as of June 30, 1983) there is still a total amount of Rs.3,494,222 to be released for funding approved for the 800,900 and 1000 series bridges. The SBD accounts indicate that they still has to submit Statements of accounts for some of the 700, 800 and 900 bridges and for all 1000 series bridges with an approximate net claim of over Rs.350,000 (Rs. 1.70 million to be returned to the USAID out of advances obtained for 700, 800 and 900 series bridges and Rs. 2.33 million to be claimed for reimbursement of expenses made for 1000 series bridges). Thus nearly Rs. 3 million is expected to be unused out of the approved grant. The SBD can claim expenses made until June 30, 1983 within nine months of the Project completion date (i.e. by March 31, 1984).

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4.2 Evaluation of the Fiscal Procedure

The reimbursement system of releasing aid funds is certainly not practical for the smooth functioning of the project. There is no provision under the budgetary regulation of HMG to provide for separate working capital for line agencies like the SBD responsible for implementing development projects. Whatever amounts are appropriated in the budget are all allocated to certain expected costs and the SBD can have no access to other funds out of which expenses under the budget allocated as 'foreign aid' can be spent without access to the aid money itself. Therefore, from the perspective of the SBD the advance system of fund release is the best.

The problem with the advance release system, as has been experienced in the TSB-Project, is the long outstanding advances about which the donor agency is unable to ascertain whether the money has been actually utilised or not and, consequently, the inability to fully disburse aid funds in a planned manner. The basic problem is the poor financial management, monitoring and recording system of the SBD (see section 4.3) as well as non-completion of projects in targeted time. There is no other solution to this problem than upgrading the efficiency of the SBD. Strict enforcement of the agreed procedure by the USAID would necessarily mean substantial delays in bridge construction.

A conservative policy, for better control of the AID fund, may justify USAID to institute a reimbursement system under which the amount actually spent is replenished to the SBD only upon receipt of satisfactory statements of accounts. But as realised during the early phase of the project, continuation of such a system would have meant a considerable set-back in the project target of bridge construction. Apparently the assessment of trade-offs, in our point of view, favours the advance system under which in spite of the delays in accounting for the advances the SBD has been able to make farily good progress in construction.

For the 1000 series bridges which were again funded under the reimbursement system, the SBD was able to squeeze out some funds from other projects through time phasing and also from the use of reimbursable balance of advances made by USAID under 800 and 900 series bridges. The incentive on the part of the SBD for doing this was that the Grant would otherwise be unutilized and that this was only to be a temporary recourse[2/]. But if the project would have been extended for a longer period the continuation of this system could not have worked. For example, lack of funds compelled the SBD to reschedule construction of two of the 1000 series bridges for next year although contract awards were already made for their construction.

Besides the two systems -- reimbursement and advance -- an alternate system of providing a 'revolving fund' is also possible. Under this system a fixed sum mutually agreed upon could be advanced initially. The SBD can then submit statements as and when expenses are incurred which could then be replenished promptly. There would be no specification as to the statement submission dates. The merit of this system is that the SBD will always have at hand a fixed working capital and there is an incentive to submit accounts as soon as expenses are incurred and not wait until the due submission date. In this sense the 'revolving fund' system would be a combination of both the 'advance' and 'reimbursement' system. Our discussion with SBD Chief suggests that this system would be preferable but the 'revolving fund' should be sizeable; 50% of the annual aid allocation was suggested but we feel that 25% to 33% should be enough.

Since the real problem of the SBD's inability to submit timely statements of expenses is not related to the fiscal procedure for release of funds but mainly to the poor financial management of the SBD; a brief discussion of this follows in the next section.

2/ The 1000 series bridges were approved on February 10, 1983 and all expenses had to be incurred by June 30, 1983.

4.3 Problems in Timely Submission of Accounts by the SBD

The following were among the major reasons for the inability of the SBD submit timely statements of accounts for the funds released under the USAID grant.

1. Inappropriate Accounting System : There is no project accounting or program budgeting system in HMG. Budget preparation & expenses records are maintained under four major categories and 12 main account heads (see Annex 4.1 to Chapter 4). All bridge constructions are lumped into one accounts head, namely 'Construction'. So there was no necessity for SBD to develop a system to maintain expenses record by individual bridges although the requisite information are available somewhere scattered in various files. After the TSB-Project agreement, keeping bridge accounts became necessary but there was no procedure or system developed. Since this was not necessary for regular HMG auditing, conscious attempt to maintain up to date bridge account was never made. Even now bridge registers are maintained only for the USAID funded projects and that too does not incorporate all relevant expenses. For example, many SBD expenses are not attributed to any bridges such as central administration costs, part of the cost of survey manpower and designs, and the like. In the absence of proper bridge accounting system preparation of statements of accounts as required by the USAID became a complicated exercise and took long time.

2. Lack of Staff : Until May 1982, there were only one Senior Accountant and an accountant in the central SBD office who had to look after all accounting. It was simply not possible for them to cope with the overwhelming accounting work. Thus accounts submitted from individual project sites remained unprocessed for a long time even after they were received by the SBD in Kathmandu.

3. Late Submission of Accounts from the Field Sites : Monthly and quarterly statements of accounts were supposed to be submitted regularly from field sites. But this was not followed in practice. Usually project-in.charges or sub-accountants deputed to the field submitted accounts only when they return to Kathmandu for expediting release of additional funds or in connection with some other work related to the project. Often accounts were submitted only after completion of construction which meant delays of months or even years. The reasons often mentioned are remote construction sites, inefficient postal system, e.g. statements reaching the SBD very late or never, and the like. But the real reason is the expediency on the part of site officials to submit statements upon return to Kathmandu and inability of the SBD to strictly enforce rules partly because of the centralized organization and dispersed sites.

4. Project not completed in time : When projects were delayed due to factors within or beyond control of the SBD (transportation, fabrication, etc., not in time), statements of the advance already released were subsequently delayed as well.

5. Freezing of Account : When appropriated budget is not spent within the FY, the project construction accounts maintained and operated by project-in-charges in the respective districts are 'frozen' by HMG. Defreezing of the accounts for the next fiscal year takes somewhere from five to six months since the respective banks send the statements to the Accountant General's office and to the SBD only after three months from the end of the FY[4/]. without varification with this statement the SBD cannot submit accurate statement to the USAID.

6. Long period for Transfer of fund to the SBD Account : About 1½ to 2 months is involved from the initiation of release requests from the SBD to actual transfer of funds to its accounts. The release is quite prompt from the USAID. But after the USAID sends cheque to HMG Foreign Aid Account in the Rastra Bank, the communication and clearance process within the Ministry of Finance (through the Accountant General's and District Kosh Tatha Lekha Niyantra Offices) takes a long time. Thus there is about two months difference in USAID's record of release and SBD's record of actual receipt. Even without delays from other factors a delay of two months will be automatic for submission of the statement of expenses.

It should be mentioned that the fund release procedure under SATA aid is much simpler. SATA has its accounts with Nepal Bank Ltd. and approved funds are directly released by transferring funds from SATA accounts to the SBD account in the Rastra Bank which takes a maximum of two weeks.

4/ Cheques can be cashed within 3 months from issue date. So the Bank waits for this period before sending statements.

The state of the SBD accounting is reflected by the fact that HMG auditing of the SBD accounts has been completed only up to 1978/79. Accounts of subsequent years have not been cleared by the Audito General Office because there are, among other problems, unaccounted advances for millions of rupees for which there are no supporting statements and/or documents.

4.4 Conclusion and Recommendations

The reimbursement system of fund release is not practical because the SBD lacks access to working capital. From the SBD's point of view as well as for construction to progress smoothly an advance system is preferable. But because of the bad state of fiscal management within the SBD the advance system has created difficulties in monitering the use of funds and in planning fund disbursement for the USAID. We suggest that in future aid projects fixed 'revolving fund system' be instituted. Irrespective of the procedure followed it is also necessary that the agreed procedure should be strictly followed even at the cost of temporary delays in project implementation.

The record keeping and accounting situation has been reportedly improved and has now become more up to date after addition of four accountants in the center and 37 sub-accountants for bridge sites in May 1982. Since last year internal auditing system has also been introduced in the SBD. More strict rules are being enforced for prompt submission of accounts (monthly & quarterly statements) from the field with the encouraging result that very few statements are now received later than three months from the due date. A task force consisting of representatives of SBD, MPLD, SATA, Accountant General's Office, and Ministry of Finance has been created to find out ways of improving the accounting system. Their first meeting is expected to take place sometime next month. The SBD Project Chief is now confident that up to date accounting will not remain a major problem.

With the bottleneck of manpower removed, it is our impression as well that up to date record keeping may now be possible. But three cannot be good financial control and clear monitoring of activities without maintenance of an up to date and scientific bridge accounting system. We strongly recommend that such a system be instituted althogh it is not statutorily required under HMG. The USAID Project has terminated but SATA assistance is still continuing and other donors (bilateral or multilateral) may be interested in financing SBD activities. Since scientific record keeping and financial management reflect institutional capability to effectively absorb aid funds the SBD should institute a bridge-accounting system as a prerequisite before shopping around for foreign assistance.

We also recommend that a fund release process similar to that followed by SATA should be instituted in future foreign aids to the SBD. If HMG can approve such a simple procedure for SATA it ought to be applicable to other agencies as well. This will substantially curtail the gap between the fund release date from donor agency and actual receipt by the SBD.

Annex 4.1 to Chapter 4

EXISTING BUDGET CATEGORIES AND ACCOUNT HEADS OF HIS MAJESTY'S GOVERNMENT

A. Administrative Expenses :

1.	Salary
2.	Allowances
3.	Travelling and Daily Allowances
4.	Services
5.	Rent
6.	Repair and Maintenance (of office assets)
7.1	Office Stationaries
7.2	Books and Periodicals
7.3.1	Fuel for conveyance
7.3.2	Fuel for Miscellaneous
7.4	Mess and Dress
7.5	Non-durable Goods
8.	Economic Assistances, Donations, and Prizes
9.	Contingencies for Office

B. Durable Assets :

10.1	Furniture
10.2	Vehicles
10.3	Machinery

C. Fixed Assets :

11.1	Land
11.2	Building

D. Construction :

12.1	Building Construction
12.2	Construction

CHAPTER - 5

INSTITUTIONAL CAPABILITY OF SBD

5. Highlights of the Institutional Growth of SBD

SBD was established 19 years ago (1964) as a separate division under the Department of Roads in the Ministry of Works and Transport. Though the genesis of American aid for bridge construction in Nepal started as early as 1958, the need for a separate SBD was the initiation of USAID which was keen enough to see its own TSB-Program become a success in Nepal. Two major objectives of SBD were as follows.[1/]

(a) It will construct suspension/suspended bridges and maintain them throughout the nation. The span of the bridge will be normally more than 50 meters long.

(b) It will improve the approach trails within a kilometer distance of the bridge.

Since its inception in 1964, resource (manpower and capital) has been a major constraint in SBD. In addition to U.S. assistance, it gradually started exploring the other foreign donor agencies; and financial assistance was readily provided by UNDP, IBRD & SATA that were all interested in the developmental programs of Nepal. But SBD suffered from a shortage of trained manpower for survey, design and construction of bridges. This problem has been partly solved since 1972 by SATA which provided not only material support but also technical manpower to SBD. With the help of SATA, a separate design section was established in SBD in 1972.

1/ USAID documents 1979; EAST Report 1978: 14-15.

In 1978-79, SBD initiated a program of decentralisation in four development regions. However, the program ended up in a failure within a year and thus SBD was once again centralized. At present, there are five regional sections in SBD which plan, design, erect and maintain bridges throughout the Kingdom.

In 1981, the SBD was transferred from the Ministry of Works and Transport to the Ministry of Panchayat and Local Development (MPLD); it is one of the divisions which performs its activities under and Technical Department of MPLD. (For more details, see Chapter I, Section 2).

5.1 Assessment of Physical Performance: 1979-1983

An institution's achievement of its objective is an important indicator of institutionalization. It has already been mentioned above that a major objective of SBD is to construct suspension bridges throughout the kingdom. An assessment of physical performance of SBD would, therefore, be a major indicator of the state of its institutionalization. Table 5.1 presents a list of total bridges completed from the time of its inception to August, 1983.[2/]

2/ Though the number of bridges constructed by SBD since 1964 has been referred to here, the discussion that follows covers the period from 1979 onward for which data are available. This time period also signifies the TSBP - 367 - 0119 Plan Period.

Table 5.1

National Targets of the Construction of Suspension Bridges and Achievement of the SBD: 1964 - 1983.

Period	Number of Completed Bridges	National Targets (Five Year Plan) Number	Physical achievements of SBD in terms of (National Target) %
1965-1970	12	15 (Third Plan)	80
1970-1975	17	27 (Fourth Plan)	63
1975-1978 1978-1980	21) 23)	50 (Fifth Plan)	88
1980-1981 1981-1982 1982-1983	26) 30) 26)	300 (Sixth Plan)	46*

Sources : i) EAST Consulting Engineers, Trail Suspension Bridge Study, Interim Report, 1978 for the number of bridges constructed upto 1978.

ii) The SBD, for the number of bridges constructed since 1979.

Based on the average target of 60 bridges per year for the first three years of the Plan.

As part of the national Five Year Plan target, SBD has its own annual targets set for bridge construction. The number of bridges which were completed in the targeted periods is given in Table 5.2.

Table - 5.2

Number of Bridged Completed in Targeted Periods

(1979 - 1983)

Development Region	Completed in targeted periods (Numbers)	Not completed in targeted periods Numbers	Total Bridges
Eastern Development Region	20 (80%)	5 (20%)	25
Central Development Region	19 (73%)	7 (27%)	26
Western Development Region	15 (58%)	11 (42%)	26
Mid Western Development Region	8 (44%)	10 (56%)	18
Far Western Development Region	1 (10%)	9 (90%)	10
Total	63 (60%)	42 (40%)	105

Table 5.1 reveals that SBD has nearly achieved the national targets of bridge construction. SBD achieved 80% of its objective in the Third Plan (1965-70): 63% in the Fourth Plan (1970-75) and, 88% in the Fifth Plan. The Sixth Plan (1980-85) obiously was too ambitious and unrealistic which aimed at constructing 300 bridges throughout the kingdom, without giving any consideration to SBD's capability. Only 82 bridges therefore could be constructed during the first three years of the Sixth Plan period.

Table 5.2 gives a pitcture of SBD's set targets and achievements between 1979-1983. This indicates that achievement of its annual target was 60%.

In brief, tables 1 and 2 suggest the following points :

i) Upto 1980, the fiver year plan targets for bridge construction was low but seemed realistic; considering the capability of SBD. Therefore, the overall physical achievements of SBD were very good up to that period.

ii) Compared to the past five year plan targets, the target of the Sixth Five Year Plan was obiously too ambitious. Looking at the present capability of SBD, how such a target was fixed is a moot point. Although the achievements for the first three years of the Sixth Plan is 46% and is much below the set target, it should not be considered a poor performance of the SBD in consideration to the very high expectation of Sixth Plan.

iii) In absolute terms, the capability of SBD in bridge construction improved steadily until 1978 and has grown significantly since 1979.

iv) In spite of the significant physical performance of SBD, only 60% of the bridges have been completed within its own targeted completion period. It can be due to several reasons; some of which are within the control of SBD and others are beyond its control. Sometimes, project planning and selecting a site for bridge construction take a long time. The Ghopatar bridge site area, for example, was originally selected in 1979 but was finally shifted to Silaurighat for bridge erection for technical reasons. This bridge erection was finally scheduled to be started in 1983.

Here SBD is partly responsible for not selecting a proper site for bridge erection which delayed the targeted activities of bridge erection. The other related problems are the non-availability of contractors and good quality timbers for decking in time, difficulties in procurement, fabrication and carrying the construction materials to the bridge location areas. The construction of Raighat bridge, for example, was delayed due to non-availability of contractors and good quality timbers in time. These problems are beyond the control of SBD.

v) Compared to the Eastern and Central Development Regions, the physical achievements in the other three Regions are poor. Apart from the problems discussed above, another problem pointed out by the SBD officials was that few professionals are willing to go to the Mid Western and Far Western Development Regions for the feasibility survey and bridge construction. This is because of the remoteness and lack of transportation facilities in those areas.

In spite of these constraints, the SBD has made good progress in its physical achievements in recent years. Though SBD still has to handle various problems which are discussed in the following sections, it is trying to grow into a viable institution capable of delivering expected physical outputs in future.

5.2 Assessment of Current Organization and Manpower

The capability of an organization is reflected in its resources (manpower and money), leadership and general administrative framework which play an important role in the maintenance and effectiveness of the organization.

Manpower is an essential component of an institution. The quality of manpower reflects the capability and viability of an institution. An institution becomes more stable and secure if the quality of manpower is good, i.e. it efficiently performs the functions for which it is established. In addition, adequate manpower is also essential for an institution to meet its own set target of activities.

This section discuss various inter-locking factors for assessing the present organizational capability of SBD. These factors are :

i) Manpower in relation to bridge construction;
ii) Manpower training;
iii) Fiscal resources; and
iv) General administration and fiscal management.

5.2.1 Manpower in relation to Bridge Construction

Table 5.3 gives a breakdown of technical and nontechnical manpower[3/] working at SBD.

Table - 5.3

Manpower at SBD

Year	Technical	Non-Technical	Total Manpower
1981 - 1982 (Number)	60	47	107
% of Total	(56)	(44)	(100)
1982 - 1983	127	118	245
% of Total	(52)	(48)	(100)
% increase in 1982 - 1983	112	151	129

3/ A list of technical and non-technical manpower furnished by the SBD includes Divisional Engineer, Geological engineer, Design and Field Engineers, Overseers, Sub-Overseers, Machanics, Electrician, Draftsman on the Technical side, and Auditor, Accountant, Sub-accountants, Nayab Subbas, Store Keepers, Kharidars, Typists, Drivers, Peons and Chaukidars on the Non-Technical Side.

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A total of 138 personnel have been added to SBD's manpower within a year. Today, SBD has a full-time staff of 245 persons; of them 52% are technical. There are 21 assistant engineers and 63 overseers who comprise 66% of the manpower on the technical side. One field engineer and one design engineer are responsible for erecting and maintaining bridges in one development region. Further, an extra pool of about 10 engineers are redily available for the various SBD activities in the Center and outside. In addition, there is a team of SATA engineers (four Swiss and one Nepali) who assist the SBD engineers working at various development regions. The SATA engineers work jointly with Nepali engineers and help them in site selection, survey, design and other engineering works.

The sudden increase in manpower by 151% in 1982 does not seem to correlate with the number of bridges constructed since 1979 (see Table 2.1). The figures suggest that on average, 25-27 bridges have been constructed and, this ratio has not been changed to the same extent as the manpower has been increased after 1982. One of the important reasons for this is the lack of adequate number of trained staff to go to the field sites. Though the number of overseers has been increased by more than 100%, only about 15% of them are experienced enough to work in the field sites independently and consequently there has been no significant change in the number of bridges completed in 1981 - 82 and 1982 - 1983.

On the other hand, the SBD Chief gives sufficient reasons for justifying the need of additional manpower in SBD. According to him, there was a shortage of staff, and an overseer had to look after a total of 3-4 bridges a year up until 1980. This has created delays in the implementation of the bridge construction program in many field-sites. Simultaneously, the SBD is also increasing its overall target every year. A contract was signed with the USAID to implementing the TSB-Program which demanded additional manpower. In 1983-84,

there are a total of 89 projects at hand; of them 36 are carry - over bridges, 26 are new ones for erection and 27 bridges are under fabrication. This means 62 bridges are at hand to be constructed in 1983-84.

Up until 1982, the SBD had a maximum capacity of constructing 30 bridges a year. Normally, the manpower required to erect a bridge at any particular site includes an engineer or an overseer (depending upon the type and span of bridge), one mechanic (only in some bridges), one subaccountant and a supervisor (hired on wage basis for each site). Looking at the present staff of SBD which comprise 21 engineers, 63 overseers, 59 sub-accountants and 24 mechanics(both senior and junior), this manpower seems to be more than adequate to construct 30 bridges a year. According to the present Division Chief, this manpower has the potential to construct 40-45 bridges a year. This clearly suggests that SBD's capability of erecting more bridges has now certainly increased.

To sum up, there was a shortage of manpower in SBD in the past which created delays in the scheduled targeted activities of bridge construction. The recent increase in manpower has substantially enhanced the capability of SBD to construct more bridges in the future.

5.2.2 Manpower Training

Along with the increase in manpower, it is also necessary to assess the quality of manpower which directly affects the capability of SBD.

Since its inception in 1964, SBD had been facing the problem of trained manpower for survey, design and bridge erection. So when the TSB-Program was launched, it was considered necessary to train some SBD personnel in the field of geotechnical engineering. In

order to provide training, the Roads Department sent 14 trainees abroad[4/]. The conditions laid down for the training were: i) candidates will work in Nepal; and (ii) except under most unusual circumtances candidates will remain in the position for which the training is received.

It is interesting to note here that not a single staff member trained under the TSBP agreement is working for SBD. The training was intended for the most part to the personnel of the Roads Department, not especially meant for the SBD. As per the TSBP Agreement there was no binding rule requiring that the SBD personnel should be trained. So one of the sub-components which stipulated that the TSB-Program will enhance the quality of manpower at SBD was not achieved.

On the other hand, manpower training to the SBD personnel was provided by SATA staff who have started an annual training program since 1979. According to the present co-manager of SATA, there were very few trained Nepali engineers and technicians at SBD about a decade ago who could perform the survey, design and related engineering works. This may be an over statement, but clearly suggests the past capability of the SBD. SATA has imparted training to Nepali engineers, overseers and other technicians in their related fields of survey, design, construction and maintenance. Since then, 20-25 people were trained every year. Today more than 75% of the feasibility surveys, designs, bridge construction and maintenance are done by Nepali engineers and technical staffs. Though SATA's staff are still helping SBD's technical staff for the overall bridge construction program, they feel that the Nepali engineers and technicians are capable not only providing training for the beginners but also of constructing and maintaining bridges throughout the kingdom. SATA's contribution to this field is worth noting.

4/ Ten trainees were sent to India for a short-term training and four to Bangkok and the U.S.A. for the Masters level study Program.

It is also worthwhile to review here the approach of two donor agencies who had offered to provide training to the SBD's staff. The USAID's training objective was to train staff somewhere outside Nepal, i.e. India, Bangkok and the USA. They did not take trouble to rationalize the training program in terms of the type of training, the place of training and who needs such training. It seems to be a "soft approach" whereby funds were provided without visualizing the problems and the needs. On the otherhand, SATA provided training in Nepal-considering the Nepalese field situations. SATA's approach here is more appropriate than that of the USAID.

To conclude, the training provided by SATA has helped to improve the quality of SBD staff. SBD's capability in recent years has been increased not only in quantity but also in quality. Such type of training activity, as was initiated by SATA, should be continued to maintain and upgrade the capability of SBD staff in bridge survey, design and construction.

5.2.3 Fiscal Resources

The annual budget of SBD over the past four years is given in Table 5.4. There has been an overall increase in the SBD's budget from 1979-80 to 1981-82, principally on account of foreign aid. Compared to 1979-80, the budget has been increased by 15.6% in 1980-81 and by 15.8% in 1981-82. On the otherhand, the budget has been decreased by 15.5% in 1982-83. This is partly due to SATA's declining contribution.

The SBD's annual budget consists of contributions from HMG, USAID, SATA & KHARDEP. This indicates that SBD is still dependent on foreign resources. It can be seen that HMG's contributions to SBD are steadily increasing whereas those of the donor agencies,

particularly SATA have gradually declined. On the other hand, the USAID asistance to SBD terminated in June 1983 because of the termination of the TSBP-agreement with HMG. This has forced HMG to raise its contributions in 1983-84 which is expected to be Rs.25,500,000 or about 82% of the total budget of fiscal year 1982-83[5/].

Table - 5.4

SBD's Annual Budgets and Foreign Contributions :
(1979 - 1983 (in Nepali Rupees)*

Source	1979-80	1980-81	1981-82	1982-83
HMG	5,716,877 (20.8%)	6,591,409 (20.7%)	8,234,031 (22.3%)	7,155,944 (23.0%)
SATA	16,829,487 (61.1%)	14,797,926 (46.5%)	14,740,551 (40.0%)	7,966,294 (25.5%)
USAID	4,994,903 (18.1%)	9,596,230 (30.1%)	12,802,347 (34.7%)	15,529,010 (49.8%)
KHARDEP	-	862,666 (2.7%)	1,107,688 (3.0%)	529,012 (1.7%)
Total :	27,541,267	31,848,231	36,884,617	31,180,260

* Figures are rounded off.

HMG seems to be committed to increase its contributions to the SBD's overall construction program in the country. It has increased the budget allocation to SBD from its internal resources. But considering HMG's own constraints in fiscal resources, external

5/ Based on interviews with the present Division Chief of SBD.

fiscal resources to SBD are still desired to continue its future programs. Considering the commitment of HMG to expand SBD's construction activities and the likelihood of continuing or new foreign assistance, financial resource does not seem to be a constraint for the improvement of the SBD's capability.

5.2.4 General Administration and Fiscal Management

Efficient administration and fiscal management are important elements in the institutionalization of an organization. Both elements carry heavy weights for the negative or positive efficiency of an organization. Efficiency of an organization ultimately determines the future of an institution.

Although SBD has already developed technical capability, general administration and fiscal management are not functioning well. A review of the general administration of SBD reveals many weeknesses. Let us begin with an example of the program of decentralization which died in its infancy.

Decentralisation

In congruence with the overall national regional development programs, the Department of Roads (DOR) initiated a program of decentralisation throughout the kingdom and created four regional offices in 1978-79. As SBD was one of the divisions of the Roads Department, SBD also created four regional offices under the supervision of the Department. The SBD's rationale behind decentralization was as follows :

> "Decentralization is the first step in a long-range program to improve the SBD's overall maintenance capacity. In conjunction with the physical staff of personnel closer to the target rural areas, the Division will also gradually shift the responsibilities for program planning, budgeting,

procurement design, contracting and maintenance from the Central Kathmandu SBD office to the four new Regional SBD offices. Thus the reorganisation decentralises the required manpower, the essential fiscal power and the final decision making power and thereby minimizes the bureaucratic, communicative and logistical problems with a regular preventative maintenance capacity"6/.

But after one year of experiment, SBD was recentralized with a centrally located regional section in Kathmandu. But why did this novel idea of decentralisation which started with a full zeal a year ago have to be withdrawn from SBD ? The real problem here seems to be the practical drawbacks of the program; it lacked a clear vision and understanding of the program of decentralisation. The problems stem partly from the central theme of decentralisation itself. Though men, materials, the responsibilities and the executive powers to implement plans were decentralised, programming, accounting and auditing were all centralised. On the otherhand, a lot of malfeasances were also reported from the Regional Offices. In some cases, tender forms for bridge construction contracts were distributed within the periphery of the Regional SBD officials while almost all the contractors for bridge construction were from Kathmandu, rather than from the concerned Regions. So the whole idea of decentralisation did not work. As the communications link between the Center and Regional offices were poor, the Center was not in a position to assess the activities in the Regional offices. In addition, the question of technical competency of the SBD personnel as

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6/ USAID, Project Paper, Nepal (Trail Suspension Bridges - 367-0119), August 1979, p. 13.

a whole will receive no attention simply because there is less chance for a discussion to improve the quality of the SBD's programs of bridge erection and maintenance. This is vital for a growing institution like SBD where gradual enhancement of technical competence and skills is desired. Moreover SBD was also facing the shortage of manpower for effective decentralisation. This problem is well noted by EAST's Report (1978: 15). "If the present group of people were grouped into four units, it would stunt the growth of technical knowledge, and duplication of work would occur".

The other problem is the small-scale activities of SBD to justify the four regional offices. As SBD was dependent on foreign resources, it was not economically feasible to maintain four regional offices and to bear the minimum costs of establishment and overheads. SATA was not eager to decentralise its resources not only because of logistics and communication problems but also because of the problem of distributing its manpower and money. Decentralisation could have been justified if the scale of activities of SBD were large enough to bear the costs of regional offices.

In brief, decentralisation was initiated with a good rationale. But considering the practical difficulties of control, coordination, logistics, coupled with the constraints of fiscal resources and trained technical manpower and the small-scale activities of SBD as a whole, the program of decentralisation was a failure. It can be considered a premature attempt on the part of SBD.

General Administration

This section discuss keeping in mind three major problems : (i) Administration; (ii) Turnover of personnel; (iii) Stores. Fiscal management as a problem is discussed seperately.

a) Administration :

The Project Chief of the SBD is a Divisional Engineer (D.E.). a Class II Gazetted officer (see the organization Chart, Figure I). He is the general administrator to run the institution. There are Regional Unit Chiefs under him who assist him in the implementation of the various regional SBD's programs.

There are clear managerial and administrative problems in SBD. This is mainly because the SBD Chief has enormous responsibilities but has little authority to execute power or to stop malfeasances within the institution. The D.E. has little power to transfer even a junior staff because of the political pressure over which he has no control. The record keeping is poor at SBD. In our inquiry, except for the bridge estimate and design, there are none or incomplete records of the site surveys, bridge request letters, and the overall yearly progress of the project. There is no proper record keeping on what is the condition of a particular bridge site after its erection. All these clearly reflect organizational problem in SBD.

The work morale of the SBD staff also seems low. Some engineers who were asked about the missing files of their Regions were least bothered, which indicates a clear lack of determination.

and commitment on their part. We also observed that a special extra allowance of Rs.2,000 was paid to survey engineers and designers by SATA's management simply because few engineers were not prepared to do such jobs without allowances. Such work morale, no doubt, will negatively affect a growing institution like SBD.

b) Turnover of personnel

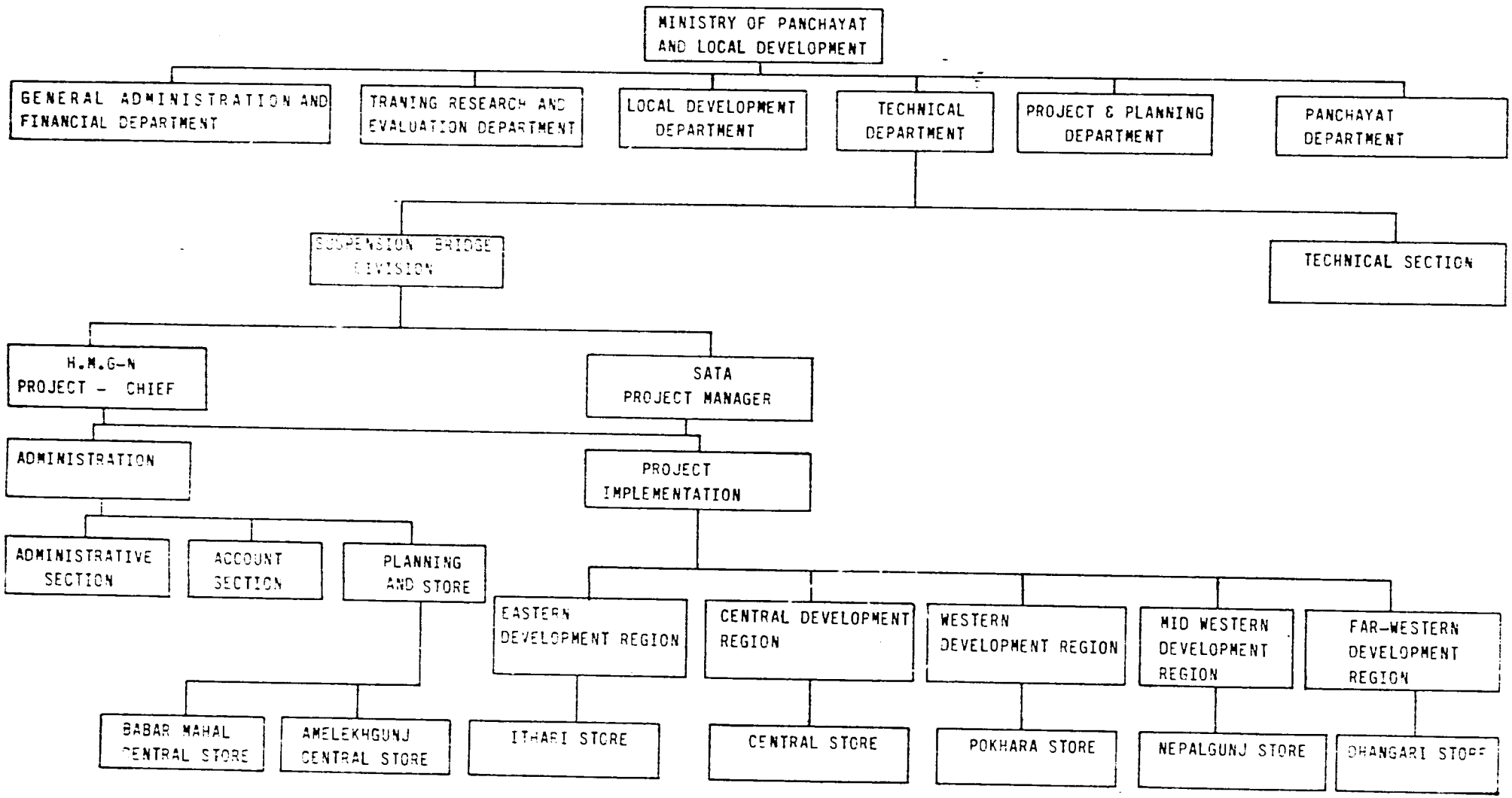
The other problem at SBD is the constant transfer of personnel. A permanent member of staff is also sometimes constantly transferred when there is a conflict of interest within the Division. Sometimes transfer of a staff member is also made by higher officials even without notifying SBD. Decision to transfer a person is also made politically, In addition, till today, more than 50% of the staff are temporary. The problems of stores and fiscal management (see below) at SBD are basically due to temporary staff. Every year a new staff member is assigned who hardly takes trouble to understand what his predocessor had done. This frequent turnover of personnel has failed to create a working environment within SBD and has produced a negative effect on the employees who are not satisfied with their jobs. In Nepal where generally a program changes along with the change of a person, this type of administrative activity is hardly programatic to develop SBD as an institution. The present Division Chief is well aware of this problem but he seems to be helpless because he cannot solve this problem by bringing about any constructive change in this administrative set-up.

c) Store

The other problem at SBD is the poor maintenance of stores. Two types of stores are maintained: i) Central Store, and (ii) Regional Stores. A store of SBD contains not only the camping equipment but also a variety of bridge erection materials.

Figure - 2

ORGANIZATION CHART



In SBD, store records are poorly maintained and it is difficult to ascertain how many and what kinds of materials are there in a particular store. Things are arranged haphazardly and are sometimes mixed up which makes it difficult to locate an item in the store. Even at present, a systematic record of store is not available. This lack of record has also hampered the auditing procedures. SBD has not cleared its accounts since 1979 partly because of the inability to account for the materials acquired and issued.

It is also reported that many site-incharges who had gone to the bridge erection sites had left the field materials there. Today, very few of people take the responsibility of these left out materials as some of these site-incharges were already transferred to other offices.

This problem was partly due to lack of adequate manpower to work in stores. A Kharidar who is a non-gazetted second class employee of MoG is the overall in-charge of a store with hundreds of thousands of rupees worth of materials. The other problem is partly due to temporary staff in stores, who misallocate the resources without records.

Briefly, the problem of store is still prevalent in SBD. However, recently a task force consisting of representatives from SBD, CPLS, SATA, Accountant General's Office and the Ministry of Finance has been created to improve accounting and the stores management. Similarly, manpower has been increased by more than 55% in stores since 1982. It is expected that the record keeping system will improve. In addition, it is hoped that the task force may come up with some practical solution towards a sound store management system.

Best Available Document

It must be emphasized here that the general administrative problems facing the SBD are not unusual compared to the various government offices of Nepal today. To enhance the SBD's working capability, improvements are needed not only in general administration but also in the environment within which people work.

Fiscal Management

The other problem in SBD is the poor fiscal management, though the works like transportation of materials, fabrication and the construction of bridges are done by HMG's standard fiscal procedures, the problems arise when these things are done in the field. A serious problem is the preparation and submission of accounts in time. The typical example here is USAID which was forced to change its rule of "Advance Payment System" to "Direct Reimbursement System" towards the end of the project termination period (for more details, see Chapter 4). Similarly, SATA's engineers working at SBD think that HMG's accounting procedure is complicated and unscientific. Therefore, they were forced to maintain their own bridge accounts (also see Chapter 4 for more details) within SBD.

For the last 3-4 years, auditing has not been done in SBD. It is reported that some officials who have taken thousands of rupees for the project, have kept their accounts still pending. In some cases, a fieldcrew who had taken advance money, is no longer working for SBD. Sometimes, even the temporary staffs were paid in advance for which no statements were received and today the SBD does not know their whereabouts.

One of the problems of the fiscal management at SBD had been the inadequate number of staff, a case which persisted until a year ago. A total of 30 sub-accountants for field sites were there until 1981 who were unable to cope with the work-load. However, with the addition of manpower, financial record keeping and the timely

submission of accounts have been significantly improved. Although, introduction of a scientific accounting system is still desired, the overall fiscal management is expected to be better in future (see Chapter 4 for more details).

5.3 Project Planning, Implementation and Monitoring System

In SBD, the initial project planning is simple. The number of bridges to be constructed is determined by the Five Year Plan document of the National Planning Commission, HMG. Within the framework of this national target, SBD makes its own annual plan-how many surveys, designs, and how much fabrication and erection will have to take place in a year. This is done in relation to available manpower and budget at SBD. The first phase of project planning begins with the screening of bridge request letters which come to the Center from different districts of the kingdom. The bridge request letters are channeled through the District Assembly which provides its own priority ranking of bridges to be constructed in the district. Out of these requests a short list of potential bridge sites is prepared for surveys. The field site survey demands not only detailed information on the socio-economic feasibility but also requires experienced technical personnel for evaluating the geological conditions, river course stability, decision of H.F.L., span considerations and bridge type etc. to achieve a sound bridge construction.

This is followed by the project implementation. At this point the SBD is prepared to call tenders for contract to fabricate the steel parts and other raw materials and transport them to the bridge erection sites. As raw materials are mostly imported, sometimes these are delayed in their arrival at the proper destinations which hamper the other related activities such as fabrication and transporting them to the field sites. Since 1979, almost all bridges constructed have been given on contract. Originally, attempts were made to invite contractors from the respective areas where the bridges had to be constructed. But qualified contractors were not available in those

areas. The SBD experiences indicated that the local contractors lacked experience and the technical manpower needed to erect a bridge. Furthermore, their estimates were not realistic for the project requirements and, in some cases though contract had been awarded to them they were unable to complete the contract in time which delayed the SBD's targeted activities. The problem was also to find good contractors at the Center to construct bridges in the remote areas. In Raighat, for example, the bridge construction was delayed not only due to the non-availability of contractors in time but also due to the lack of quality timbers for decking. Briefly, lack of timely fabrication, difficulties in transportation of raw materials to the field-sites the non-availability of contractors and good quality timbers for decking have delayed the implementation phase of the overall bridge erection target in many field sites.

Although SBD officials claim that there are up-to-date records on the bridge supervision and monitoring system, we were unable to find supporting documents to prove that there exists a regular monitoring system operating within SBD. Records on the bridge site inspection, materials used in the bridge are fragmentory.

Up to now, SBD has not done a long-term planning which can be used for the future. In SBD, where work is constrained by many factors, an effective medium-term planning is essential. For example, work like bridge requests, feasibility study, design fabrication, transportation and erection can be planned in advance for 3-4 years. This may not only save time, but also ensure smooth running of various targeted activities of SBD.

To conclude, there is lack of effective planning and regular monitoring process in SBD. Annual planning alone makes it difficult to proceed in advance with the time-series activities for bridge construction. To make SBD more efficient in setting its target of activities, an effective mid-term planning and regular monitoring system must be introduced.

5.4 Institutionalization of Bridge Maintenance

In SBD there is no clear record of the number and location of suspension bridges in the country. Although SBD claims that it has started recently to maintain "Bridge Registers" which will record the conditions of the SBD constructed bridges in every three years throughout the country since July 1982, it is our observation that a reporting system on bridge maintenance and repairs is poor. Due to this, though some budget is allocated every year for bridge repair and maintenance, this work is carried out only in case of an emergency. Such emergency measures seem expensive for SBD as it not only hampers the scheduled project activities but also a huge sum should be spent immediately. Similarly, even though SBD aims to visit the most of the bridge-sites, it looks, there will be problems to effectively handle this situation. The problem is who is going to the field to maintain a register ? Three years' period seems to be a long gap. The local people feel that a periodic inspection of the bridge site is necessary to maintain repairs such as damages in the wood decking and other structural adjustments of the bridge. It is felt that frequency of visits can be arranged as deemed appropriate. But the question here is how to institutionalize the bridge maintenance program effectively in SBD.

This problem is complex as it not only require more funds but also skilled manpower for proper bridge maintenance & repairs. SBD cannot impose a rule for toll collection as this program falls within the jurisdiction of the local panchayat(s) or District

Panchayat(s). Whether to collect a toll in a particular bridge is solely decided by these village or District Panchayat assembilies. This becomes further complex when a river blocks the traffic only during certain months of the year. The other problem is the skilled manpower for effective bridge repair and maintenance. The existing condition of the bridge can be checked thoroughly only when a person is semi-skilled or skilled in this field. In such a situation, a technical staff member of SBD is always necessary. We are not providing here detailed guidelines for the bridge maintenance program, but we feel that it needs a two-way control mechanism to effectively handle this problem. The local panchayat and/or district must be involved in maintaining the local bridge, and, the channeling of funds, verification of the repair works and their supervision and control must be done through SBD. A mutual agreement should be made between these two institutions as to how much money and time each will contribute for the bridge repair and maintenance program. Such process will lead towards the growth of the institutionalization of bridge maintenance program and thus will prolong the life span of the bridge.

Finally, there must be an effective regular reporting system within SBD about the needs for maintenance from different parts of the country. Only then preventive maintenance would be possible. Panchayat must be made responsible for submitting regular reports (quaterly or half yearly) on bridge condition.

5.5 Out-look of USAID & SATA on SBD's Institutionalization Problem

There are diverging approaches of USAID and SATA, the two major donor agencies to develop SBD as an institution. The Swiss are the providers of change models - they are the participants in the leadership function and are the agents for the transferrance of technology. For example, the Swiss have been providing not only monetary aids but also technical assistance in the from of manpower since 1972. The swiss engineers play active roles in

survey, design and other engineering works and have active participation in bridge selection. They standardize the bridge designs and take responsibility of the division's procurement, fabrication, construction and maintenance operations. They also initiated training to SBD's staff in the Nepalese field conditions. They are also particular about how they are going to spend their money for the project.

SATA has played an important role in building up the technical capability of SBD staff and in the quality control of bridge construction. But their overshadowing presence and decisive say in every major activity of SBD have possibly hindered independent decision - making process of the SBD's officials. SATA cannot be blamed for the poor administration and fiscal management within SBD as these activities are beyond their control. It can be said that SATA's efforts to institutionalize SBD started with their active participation within the system. This has a positive bearing on the overall institutionalization process of SBD.

The USAID's approach, on the otherhand, was to create basic infrastructure to develop SBD as an institution. But their approach was less participatory than SATA. The USAID tried to help institutionalize SBD by providing resources only. They also attempted to develop a system to institutionalize site selection procedure, out of which a standard manual was developed. However, this manual was rejected in practice by HMG. This was because the AID people never enforced the agreement terms with strong "will". SATA did not show any particular interest to apply those criteria because of their own interest in and ideas about the bridge building activities in Nepal. Unlike SATA staff, the AID people participated little in the overall programs of SBD. In practice, they showed more concern for actual bridge construction works than institutionalizing the system.

In brief, the AID people always watched the activities of SBD from a distance and there was little effective push from their part to develop SBD as an institution. It is clear that simply providing resources is not enough to develop an institution.

5.6 Conclusion

It is difficult here to give a definite conclusion on whether the SBD has been sufficiently institutionalized. There are so many variables which should be considered seriously to understand an institution like SBD. However, the following conclusions can be drawn on the basis of the discussions relating to the resources, (manpower and money), general administration and fiscal management currently prevalent in SBD.

(i) Technical capability of SBD has improved significantly over time. It is no doubt that the technical assistance in the form of foreign aids has played a constructive and effective role in the overall growth of SBD. SBD has made remarkable progress in the fields of engineering, particularly in survey, design and erecting bridges. It can be said that SBD can construct bridges with very little technical assistance from any outside donor in future.

(ii) As far as the resources (manpower and money) are concerned, they do not seem at present to be a major constraint in SBD. There has been substantial increase in the number of people assigned to the division as well as the budget allocated for the total bridge construction program. Though the Swiss and American aids have played dominant roles in SBD's activities, HMG seems to be committed to provide the necessary funds for the continuing operation of SBD as reflected by substantial increase in the proposed 1983-84 budget. Manpower is adequate to implement the projects and SBD is equipped as far as technical staff resources are concerned.

(iii) The major problems in SBD are the administrative inefficiency and fiscal management. There are problems of store and fiscal matters, and the lack of authority of the SBD Chief and the constant turnover of personnel have negatively affected sufficient institutionalization on SBD. The working environment is not sufficiently condusive to put program into action. There are reports of misallocation of fiscal resources. It should be recalled here that authority is an essential resource to run an institution effectively. Though a general improvement has been made in fiscal matters, the overall administration is not functioning well. Given the present environmental and administrative structure of HMG, a drastic measure to improve the condition is not possible. This must be a gradualistic approach and, should proceed along with the consideration of general environment and the social fabric within which people work.

(iv) There is currently no preventive bridge maintenance program in SBD. This is another important area where a major improvement is immediately needed.

(v) SBD must also develop a mid-term planning for bridge construction. A regular monitoring system for the overall bridge construction program is still desired.

To sum up, SBD has attained a certain stage of development as an institution. In the 19 years of its existence, it has definitely moved a long way to attain its set target of activities and it has developed into a capable institution. On the otherhand, there is a definite need for effective planning and to improve the general administration and fiscal matters in SBD for its effective institutionalization.

ANNEX - 1

EVALUATION STUDY: SCOPE OF WORK

A. The goal of the Trail Suspension Bridges Project (TSBP), as stated in the Project Paper, is "To enhance the quality of life of the rural population of Nepal, by increasing the flow of goods and services to and from the rural areas". This goal is to be achieved by providing financial assistance to His Majesty's Government (HMG) for the purchases of materials used in the construction of suspension bridges and to upgrade the local government's institutional capacity to rationally improve the national bridge and trail network. Specifically, the project provides a $3.0 million grant to HMG to construct 24 to 36 bridges in various parts of Nepal over three years (later extended), selection of bridge sites to be based on criteria outlined in the Project Paper.

The overall objective of this final indepth project evaluation is to determine the extent to which these project goals and purposes have been achieved. The evaluation will review the effectiveness of project inputs in achieving results at the output and purpose level as indicated in the PP's logical framework. Further, it will look at the assumptions upon which the project was designed, in order to determine their appropriateness for project success. Project Paper analyses (technical, economic and financial) will be reviewed retrospectively to determine accurateness and relevance for future project designs. Since this evaluation will be used by the Government of Nepal in planning for future bridge construction and in seeking other donor assistance for such construction, it is imperative that the evaluation present documentation and recommendations that will be useful for this purpose, i.e., based on the results of this project, what changes, refinements, etc., should be considered in follow-on projects or within the Suspension Bridges Division (SBD) itself.

B. The Contractor shall undertake an indepth study of the Trail Suspension Bridges Project in order to determine the extent to which the Project has been successfully implemented and the extent to which it has made important development impact upon the lives of the target rural poor population. Specific questions which the evaluation is expected to answer include the following :

1. How and to what extent have the lives of the people living in the bridge site areas been affected by this project ? The first and very basic assumption made in undertaking any bridge construction in the hills of Nepal is that the resultant bridges directly enhance the quality of life of the people living in the bridge area and even beyond, through an overall increase in the flow of goods and services to and from the area. Earlier studies of other bridge projects have generally proved this assumption, and it is AID's and the GON's impression that bridges constructed under this project are having a similar positive impact; however, it is the responsibility of the Contractor to test this assumption by sample measuring the extent and kinds of impact made by the project, e.g., increased agricultural production, value added to production, increased food consumption, increased access to and use of government-provided facilities such as hospitals, health posts, schools, etc. This measuring may be undertaken by sample interviewing of local residents and officials in several bridge site areas. If possible, findings should include recommendations on how positive impact can be enhanced in future projects, perhaps in conjuction with other specific, targeted development activities.

2. Are the bridge site selection criteria which are actually used in the project adequate to assure judicious selection of construction sites ? How do these criteria compare with those used previous to this project ? One of the objectives of the project is to systematize the method of selecting bridges to be constructed, and the project Paper indicates twelve (12) factors to be considered in the ranking of each potential bridge site. These include economic factors, e.g., cost, time savings for through traffic; social services, i.e., size of local population, improved access to health and education facilities; and "other" factors, e.g., local support for bridge, percentage of small farms within potential bridge site area. However, these criteria as spelled out in the PP have been tested on only two of the project bridge sites, and then only during the re-surveying of these sites. Some of the reasons given by SBD for not routinely using the agreed upon selection criteria are: (1) lack of staff, (2) the long time required to complete these detailed surveys, and (3) the inappropriateness of some of the criteria. In their place the SBD has been using criteria developed jointly by the SBD and SATA (the Swiss Association of Technical Assistance). It will be the Contractor's responsibility to review in detail why the PP criteria are not used, and to determine whether the criteria that are used by the Project are indeed appropriate in light of SBD's staff capabilities and the information required. Recommended changes, if any, in site selection procedures should be incorporated.

3. Did the fiscal procedures developed during the course of this project contribute to the smooth running of the project ? What specific recommendations can be made regarding procedures to be used in any future project ? The Project Paper called for financing the purchase of startup materials, fabrication and transportation through direct reimbursement

However, provision was made for joint USAID and GON review of this procedure subsequent to the initial reimbursement to determine whether future allowable costs should be paid following the same or revised procedures. Under this provision, an Advances System was eventually established for the 700, 800 and 900 series bridges in order to provide the GON with working capital. However, due to delays in actually expending funds and in USAID receiving certified statements of expenditures, many of these advances remained outstanding for long periods of time. As a result, the Project's final (1000) series of bridges was approved by USAID with the caveat that a Direct Reimbursement System would again be used. This decision, while partially answering USAID's financial management needs, has also apparently added to SBD's difficulties by reducing their working capital, and the overall impression is that changes in the fiscal management system need to be made. The Contractor will review and comment on the fiscal procedures used in this project from the perspective of the SBD's and USAID's financial management requirements, and make specific recommendations on how funds may be more efficiently managed in the future.

4. <u>Has the ability to plan, budget for, construct and maintain bridges been sufficiently institutionalized within the SBD to assure its functioning efficiently without technical assistance from any outside donor</u> ? One of the goals of this project is "to assist in upgrading the local government's institutional capacity to rationally improve the national bridge and trail network", and the October 1982 APAC (Asia Project Approval Committee) meeting noted that most of the Project's institutional objectives had been accomplished. It will be the responsibility of the Contractor to confirm (or disprove) this impression by looking at a number of indicators such as: (1) whether or not an effective and systematic maintenance program is functioning within the SBD, (2) whether training provided under this Project has

actually benefited the SBD and whether the number and level of SBD staff positions are appropriate to the work of the division; (3) whether or not the Reorganization and Decentralization Plan of the SBD has resulted in increased planning, budgeting and overall management efficiency within the division; (4) whether in light of SBD's capabilities further donor technical assistance should be contemplated for any future project which may provide funds for purchase of materials, etc., (resource transfer). The Contractor may need to review other indicators in addition to or in place of the above.

5. Has the lack of certain planned inputs hindered Project success ? The Project included a sub-activity which was to result in a base map of existing trunk trails and satellite trails. The Project Paper stated that "Without such a base map no rational system can be developed for planning construction, projecting changes dictated by other infrastructure construction, or systematically setting priorities for construction of improvement". Despite this, the base map has not been developed. A "Displaced Tradesmen Study" of the Majhis was also planned but never carried out. The Contractor is expected to look at all such project inputs which were planned but not made and advise whether they might usefully be included in future projects.

These questions (A through E above) are the major points which the Contractor is expected to address in detail; however, they should not feel restricted to them, since researching, interviewing, etc., may lead to other useful areas of inquiry, areas which may be important to pursue as a way of not only fully evaluating this Project but also as a way of providing useful information to other prospective donors and to the SBD itself.

ANNEX - 2

METHODOLOGY USED

For Objective 1 : How and to what extent have the lives of the people living in the bridge site areas been affected by this Project ?

Impact evaluation is to be done in the five bridge sites, already agreed with USAID socio-economic evaluation of three completed sites and technical evaluation of two incomplete sites (Bagmati and Raighat).

Suspension trail bridges are expected to have following four major effects on the local people and area affected :

1. Economic Impacts

- savings in time (and money);
- increase in agricultural production;
- increased flow of goods and services, particularly exports;
- impetus to growth of non-agricultural economic activities (cottage industries);
- regularity in food supply and consequently seasonal stabilization of price.

2. Social Impacts

- safety in travel (improvement in access and mobility of people);
- increased access to educational facilities;
- increased access to health facilities (including family planning services, widor access to faith-healers);
- increase in social and religious interactions (including marriage across the river);
- increased access to governmental and semi-governmental services;

- improved government services because of mobility of government officials and extention agents;
- improvement in women's welfare due to time and labour saved in collection fuel, fodder, and in grazing livestock.

3. Institutional Impacts

- development of market centres/growth points.

4. Environmental Impacts

- effect on forest resources (environment): negative or positive depending upon specific situation.

The impact evaluation will essentially be of qualitative nature due to several reasons :

- absence of relevant pre-project information for comparative purpose;
- effects of suspension trail bridges are of induced nature and it is difficult to isolate the effects attributable to the bridge alone, even where quantification may be possible;
- most expected effects are of qualitative nature, not easily amenable to quantification; and
- the bridges to be evaluated have been built recently and their impacts may not yet be discoriable.

Therefore, quantification will be attempted only for 'savings in travel time' and only general trend in qualitative terms can be indicated for other expected impacts listed above.

The information required for the impact evaluation will be obtained mainly from field surveys of the bridge sites supplemented by some secondary information like population-census. The methods to be followed for the fields survey are :

(a) In depth interview with a group of local key informants consisting of knowledgeable panchas, school teacher, trader, and informed villagers at each bridge site. Senior researcher will conduct this interview with the help of a prepared check list (see enclosure) to ellicit information on most of the possible impacts listed above. The group of informants will be limited to a maximum of five persons in order to keep the discussion managable. Such a group discussion has the adventage of moderating individual subjective judgement and is likely to result in a realistic consensus of each question involved than individual interviews.

(b) Traffic count at the bridge site for two days : The objectives are to estimate savings in time of the users due to bridge construction as well as to find out effects on the 'thru - traffic' in general terms. Only simple count of local traffic (defined as users within one day's walk to and from the bridge site) will be made. Non-local users will also be asked about their origin (district).

The information from the traffic-count will be supplemented by other information to be obtained from group interview of key informants, (such as, earlier mode of crossing, waiting time, detours in wet season, seasonal traffic as multiple of current traffic, and the like) in order to estimate total time savings as a result of the bridge.

(c) Examination of Records of Health Units and Schools in the neighbourhood : This will be done only if pre-project records are available*. Visits to the health units and enrollment in schools by residents across the river before and after the bridge construction will be examined to assess the actual impact of the bridge. (These information will also be obtained in qualitative terms from the group discussion of key informants).

INFORMATION FROM OTHER SOURCES FOR IMPACT EVALUATION

From SBD :

1. Date of initiation and completion of bridge.
2. Total cost of bridge.
3. Total cost for employment of local labour (if available total man - months employed).
4. Local manpower used for maintenance.

From CBS :

Panchayat and wardwise population for 1981 of the bridge sites being evaluated.

From Local Health Facilities :

Visits from across the river/stream before bridge and now.

From Local Schools :

Enrollment of students from across the stream/river before bridge and now.

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* In Benighat field trip it was difficult to get such information. As previous records in health units and schools were not mentioned.

Other Documents :

1. Administrative maps of the bridge site area.

2. Pre-project information from earlier studies of EAST (For Benighat).

(Enclosure to Methodology for Objective 1)

CHECK LIST OF INFORMATION TO BE OBTAINED FROM KEY INFORMATS THROUGH GROUP DISCUSSIONS

1. Name of village Panchayats and ward numbers within one day's walk to and from the bridge site.

2. Frequently used market centers and distance from the bridge site.

3. Other river-crossings/bridges up and down the stream and the Village Panchayats or ward number using those facilities.

4. Health facilities and types on both sides of the stream/ river : location and distance.

5. Educational facilities on both sides of the stream/river : location and distance.

6. Administrative facilities on both sides of the stream/river : list/type, location and distance.

7. Whether the bridge serves major trails or not ? If yes, districts and parts of districts served.

8. Nearby roads (to be incorporated in map of the area).

9. Traditional mode of crossing before the bridge, average waiting time, and toll.

10. Detour (as fraction of a walking-day) required in wet season.

11. Whether the bridge is located in traditional crossing point or not ? If not, detour required to the bridge site compared to traditional crossing point.

12. Seasonal average daily traffic estimate -- for peak, dry, & wet season -- in terms of the multiple of current average daily traffic (for both human and livestock traffic).

13. Current bridge toll. If charged, how is toll-money utilized ?

14. Major crops produced in the locality.

15. Has use of non-traditional agricultural inputs - fertilizer, improved seeds, pesticides, and visits by extention agents -- increased after bridge construction ? If yes, is it primarily due to the improved access?

16. Any new local development program initiated after completion of the bridge (e.g. irrigation channel) ? To the extent of the group's knowledge, were they planned before construction of the bridge or after ?

17. Has there been more frequent visits across the stream/river for tending agriculture by land owners residing on the other side ?

18. What are the major exports of the area ? Does the group think that there has been any increase in exports of those commodities after the bridge construction ?

19. What are the non-agricultural economic activities in the area (e.g. cottage industries) ? Has there been any noticeable increases in their production (as a result of easy access to inputs or to market) after bridge construction ? Any increase in number of households/people involved in the activities ?

20. Is there any component of IRD program being implemented in the area ?

21. Has the bridge facilitated regular supply of food grains and other consume necessities during wet season ? Has the seasonal price variation stabilised relative to pre-bridge period ?

22. Have now shops, services, lodges etc. been established after construction of the bridge ? If yes, type, numbers and persons employed.

23. Has there been any displacement of employment (e.g. ferrymen) as a result of the bridge ? If yes, how many ? What are they doing now ?

24. Has access to health facilities improved relative to pre - bridge period (Health posts & hospitals, Ayurvedic clinic, family planning clinic, local faith healers across the stream/river) ? Has frequency of visits of local people to these facilities increased ?

25. Has access to Educational facilities (High School, Secondary School, Primary School) increased and more students actually enrolled after bridge construction ?

26. Has access to Administrative facilities increased after construction of bridge ?

27. Major festivals in the area which are take place across the river and in which season ? Has the bridge facilitated more participation in these festivals ?

28. Number of local people that were involved during construction period of the bridge -- approximate period and numbers (This information also to be obtained from SBD).

29. Number of local people now involved in maintenance of the bridge.

30. Do the group feel that there has been more frequent social visits, relegions trips, and frequency of marriage with people across the bridge after construction ?

31. Has the bridge opened up new area for collection of fuelwood, fodder, and for grasing ? If yes, time savings in each of these activities compared to pre-bridge period. Also what is the forest condition in the new area compared to traditional source ?

32. Local endeavour in requesting and getting the bridge construction approved.

For Objective 2 : Are the bridge site selection criteria which are actually used in the project adequate to assure judicious selection of construction sites ? How do these criteria compare with these used provious to this project ?

1. Review of :

- Project Paper Criteria
- Criteria refined by East
- Criteria developed by SBD-SATA and currently in use.

2. Ascertain through interview of decision makers :

-- priority ranking method and bridge site selection before 1979;

-- priority ranking method and bridge site selection actually used after 1979.

3. Ascertain through depth interviews of appropriate officials of SBD and also USAID why agreed criteria were not actually used :

   -- problems as faced by SBD for its application;

   -- reason for USAID's inability to enforce contract agreement for use of PP criteria.

   -- interview SATA engineers for their opinion.

4. Get suggestion of concerned officials on possible ranking and selection criteria for future program.

5. On the basis of '1' thru '4' give our recommendations including changes in selection criteria, if any.

Methodology for Objective 3 : Did the fiscal procedures developed during the course of this project contribute to the smooth running of the project ? What specific recommendations can be made regarding procedures to be used in any future project ?

1. Review Contract Document and Project Implementation Letters relating to fiscal procedures.

2. Review SBD fiscal procedures including tender procedures and time involved.

3. Find out reasons of delays in submitting certified statement of expenses to USAID through interviews of SBD project Chief and Fiscal Officer.

4. Interview some project crew of SBD on their difficulties in submitted expenses statement in time.

5. Get records from related USAID fiscal officer on outstanding advances, period overdue, and find out their opinion on reason of delays in submitting statement by SBD.

6. On the basis of 1 thru 5 identify bottlenecks. Try to identify delays due to problems beyond SBD's control and delays inherent in the financial procedures of SBD. Suggest possible solutions.

7. Discuss with SBD Chief & USAID officials on 6 and find out their opinion.

8. Suggest recommendations.

Methodology for Objective 4 : Has the ability to plan, budget for, construct & maintain bridges been sufficiently institutionalized within the SBD to assure its functioning efficiently without technical assistance from any outside donor ?

In order to answer this question we will review SBD's past performance, evaluate its current organization and resources, and examine future plans.

In order to answer this question we will review SBD's past performance, evaluate its current organization and resources, and examine future plans.

1. Assessment of Past Performance : Past performance of an organization reflects, to a large extent, its current capability. Therefore, physical targets of bridge construction since 1979 will be compared with actual achievements so far. Annual plans and records of SBD will be used for this purpose.

2. Assessment of current organisation and Resources (manpower):

(a) Current organization of SBD will be evaluated with primary focus on institutionalization of major functions involved in the planning, implementation, and monitering of suspension bridge projects. For each major functions (Project indentification, survey, selection, acquisition of materials and fabrication, transportation, construction) we will examine whether appropriate working procedures have been systematized within SBD or not.

(b) Adequacy of manpower, at the current level of activities, will be examined.

(c) Assessment will also be made on the existence (or otherwise) of an effective and systematic maintenance system.

(d) Since future plans of an organization reflects its institutionalization, we will also evaluate whether realistic plans exists. The emphasis will be on planned expension of activities and provisions for manpower training and recruitments.

(e) On the basis of above recommendations will be made.

Evaluation of objective 2 and 3 of the TOR will provide further inputs to the evaluation of institutional capability of SBD.

Examination of the records of SBD, organization chart, and interviews of related personnels will be the methodology followed.

Methodology for Objectives 5 : Has the lack of certain planned inputs hindered project success ?

The project included following sub-activities;

(a) Preparation of a "base map of existing trunk trails and setellite trails";

(b) A study of the "displaced trades men" (majhis) due to construction of suspension bridges; and

(c) Training of personnels.

Through interviews of SBD personnels we will find out whether their activities have suffered in the absence the planned inputs. EAST Consultant's own impression will be presented with recommendation on whether or not the planned inputs, particularly the preparation of 'base map', is necessary for future projects.

ANNEX - 3

Brief Technical Observations on Bagmati & Raighat Bridges

Two bridge sites, at Naikhandi Ghat over Bagmati river, and at Raighat over Arun river were under construction during field visits. Therefore it was not possible to assess the impacts of these bridges however brief technical observations were made which is presented below :

Naikhandighat (Bagmati) Bridge

This bridge site is located south of Kathmandu valley towards Kathmandu-Dhaskinkali Road. At 9 Km point on this road, at a place called Chunikhel a dirt road diverts from the main road leading to old Pharping Power Station, and Naikhandi Ghat is about 10 minutes walk from there.

The bridge was under construction during our visit. Tower erection on the right bank and the tower foundation works on the left bank were completed.

It was reported that the left tower was collapsed during erection and few people were injured only few days before our visit. The technical staff were at Kathmandu arranging for reerection of the tower. And as reported by the non-technical staff, we met in the field camp, the tower at left bank was collapsed of its own weight towards the river side. As the tower was hinged at its bottom, and reportedly not connected with the erection stay cables during erection, it was but natural that it collapsed. It seems that a simple negligence on part of the bridge mechanic, resulted in the collapse of tower and nearly 1½ months delay, apart from the severe injuries to the local construction crew.

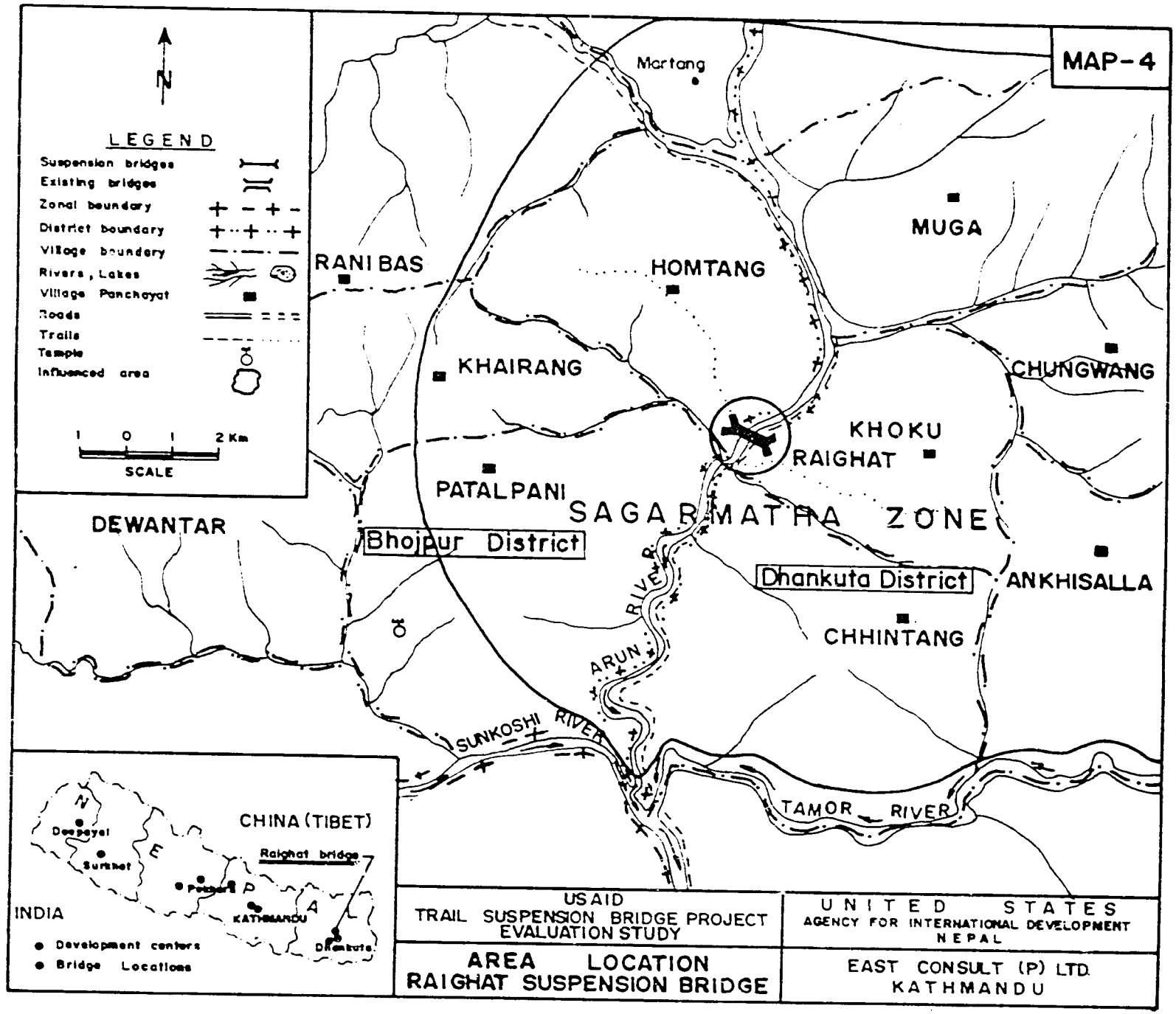
The right tower was properly anchored to the stay cables but it was observed that the cable-clamps were not sufficiently tightend and were less in numbers too. The site staff were advised to correct these to prevent collapse of right tower too.

Right bank seems to be at safer distance from the river, but some protection works are necessary to prevent the left bank from river erosion in future, as the tendency of river flow to hit the left bank seems to be more.

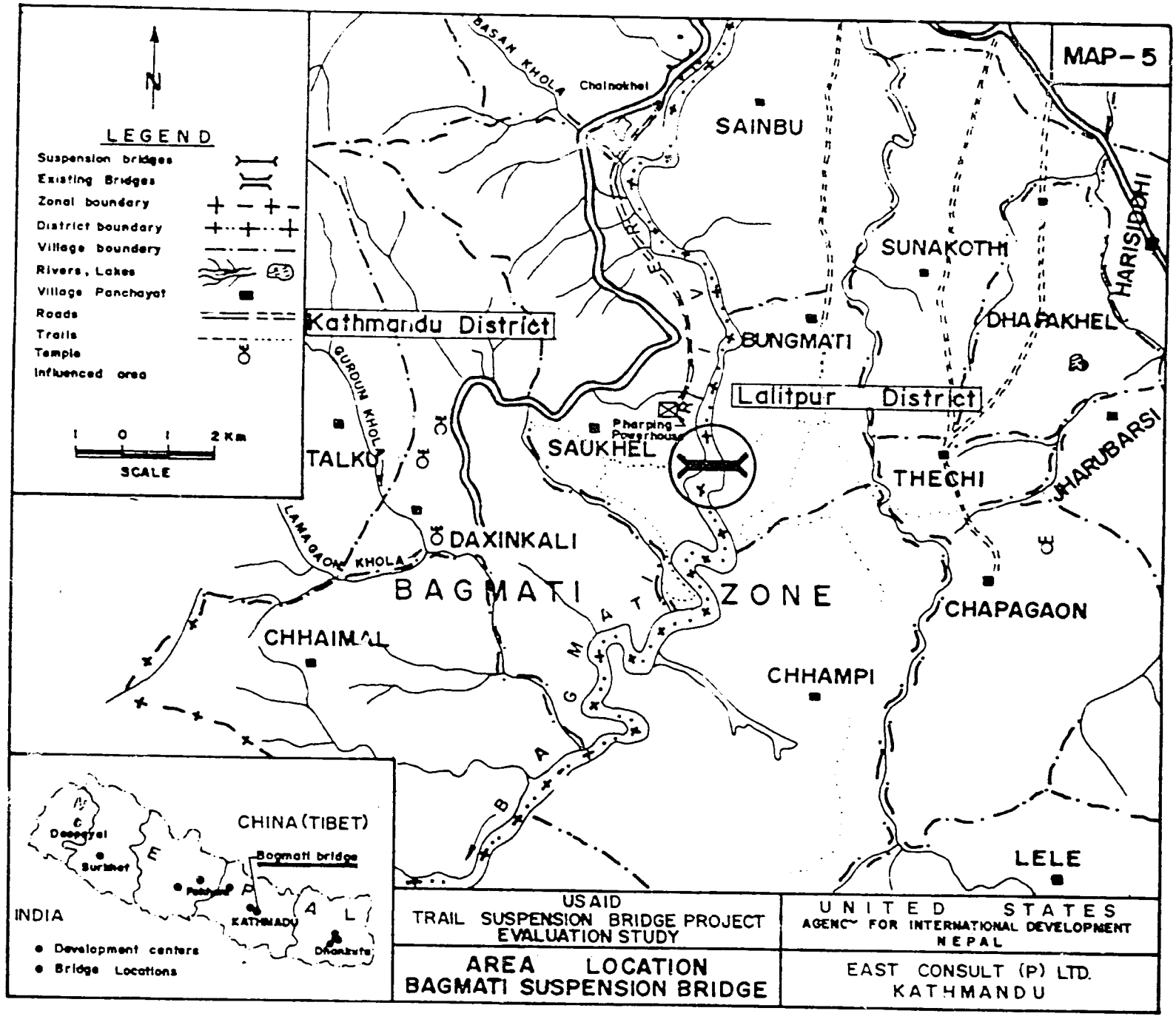
Raighat Suspension Bridge

The bridge lies in eestern Nepal over the river Arun, a major tributary of the Sapti Kosi River. The bridge site is accessble from Chatra, a place on hour's driver from Dharan from where one has to walk about 8 - 10 hours to reach the bridge site. The present bridge site is at Lamebagar well before 3 KM from Raighat proper. During our field visit, except one supervisor and two Chaukidars, there was no one in the construction camp. As reported by the supervisor, the bridge site was choosen at Lamebagar because of technical reasons. Our observation on both sites, (at Raighat and Lamebagar) reveals that the bridge site at Lamebagar is difinetly better technically. It has a shorter span than Raighat site too,

On 30th August 1983 when we visited the site, the bridge was nearly completed. Wooden decking was in progress. About 100 meters out of 141.4 meter (span) was already decked. The decking works in progress was found to be good. Joints were staggered and the width and thickness of planks used were even. Compared to other bridges visited, planking and even other bridge works here is definetly better.



CONSULT PVT. LTD.


MAP-5
LEGEND
Suspension bridges
Existing Bridges
Zonal boundary
District boundary
Village boundary
Rivers, Lakes
Village Panchayat
Roads
Trails
Temple
Influenced area
1 0 1 2 Km
SCALE
N
BASAN KHOLA
Chainakhel
SAINBU
SUNAKOTHI
HARISIDHI
DHAPAKHEL
BUNGMATI
Kathmandu District
Lalitpur District
GURDUN KHOLA
Pharping Powerhouse
SAUKHEL
TALKU
THECHI
JHARUBARSI
LAMAGAON KHOLA
DAXINKALI
BAGMATI ZONE
CHAPAGAON
CHHAIMAL
CHHAMPI
LELE
CHINA (TIBET)
Deogyal
Surkhet
Bagmati bridge
INDIA
KATHMADU
Dhankuta
Development centers
Bridge Locations
USAID
TRAIL SUSPENSION BRIDGE PROJECT
EVALUATION STUDY
UNITED STATES
AGENCY FOR INTERNATIONAL DEVELOPMENT
NEPAL
AREA LOCATION
BAGMATI SUSPENSION BRIDGE
EAST CONSULT (P) LTD.
KATHMANDU

It was reported that on 4th July 1983, falling rocks from slide hit the right bank tower, which resulted in the shifting of tower, a little bent in the tower sideways. All other fittings, such as achorage, suspender roads, wire mesh connection were satisfactorly done and no defects observed.

The delay of construction of this bridge as told by the supervisor is because of the unavailability of proper wood in the near vicinity and the delays made by forest people to allowing tress to be cut. Also the rock hit the tower which has also caused delay in final erection. The initial target of bridge completion was Dec. 1982 which was revised to June 1983, however it was not complete even in Sept. 1983 during our visit.

Annex - 4

SAMPLE OF INTERVIEW SCHEDULE USED

अन्तरवार्ता तालिका

(ट्राफिक सर्भेमा प्रयोग गर्ने)

पुलको नाम :- ..... सर्भेक्षक :- .....

पुल नं. :- ..... मिति :- .....

नदी :- ..... जिला :- ..... (बायां) ..... (दायां)

पंचायतहरू :- ..... बायां :- ..... दायां :- .....

हाल तर्ने साधन :- ..... (हिउंदमा) ..... (बर्षायाममा)

घाट पुल तर्दा भाडा रू.पै ..... प्रति पटक प्रति व्यक्तिले दिने भाडा

घाट पुल तर्दा भाडा रू.पै ..... प्रति पटक प्रति जनावरले दिने भाडा

घाट पुल तर्दाको भाडा अन्न ..... माथि (प्रति परिवारले प्रति बर्ष दिने)

क्रम संख्या	महाबाट तपाईंको घर एकै दिनमा पुगेर फेरी फर्केर यहि आउन सकिन्छ ?		सकिँदैन भने तपाईंको घर कुन जिल्लाको कुन गाउँ पंचायतमा पर्छ ?	
	सकिन्छ	सकिँदैन	जिल्ला	गाउँ पंचायत

TRAIL SUSPENSION BRIDGES EVALUATION STUDY PROJECT

CHECK LIST OF INFORMATION TO BE OBTAINED FROM KEY INFORMATS THROUGH GROUP DISCUSSIONS

1. Village Panchayats and Ward numbers within a day's back and forth walking distance from the bridge site.

LEFT BANK	RIGHT BANK

2. Frequently used market centrers and distance from the bridge site.

LEFT BANK		RIGHT BANK	
Market Center	Distance	Market Center	Distance

3. Other river-crossing/bridges up and down-stream and Village Panchayats with ward numbers using the facilities.

UPSTREAM			DOWNSTREAM		
Panchayat (or Ward No.)	Distance	Mode of Crossing	Panchayat (or Ward No.)	Distance	Mode of Crossing

4. Types of health facilities on both sides of the stream/river.

LEFT BANK			RIGHT BANK		
Type	Location	Distance	Type	Location	Distance

5. Education facilities on both sides of the stream/river.

LEFT BANK			RIGHT BANK		
Type	Location	Distance	Type	Location	Distance

6. Administrative facilities on both sides of the stream/river.

LEFT BANK			RIGHT BANK		
Type	Location	Distance	Type	Location	Distance

7. Whether the bridge serves major trail or not ? If yes districts and parts of districts served.

8. Nearby roads (to be incorporated in map of the area) from the bridge.

9. Traditional mode of crossing before the bridge.

Crossing Mode	Toll (per individual)	Waiting time	
		Human	Livestock

10. Detour (as fraction of a walking - day) required in the wet season.

11. Whether the bridge is located in the traditional crossing point or not ? If not, detour required to the bridge site compared to the traditional crossing point.

12. Average daily traffic (multiple of current traffic)

	LOCAL TRAFFIC		MAJOR FESTIVALS		
	Wet Season	Dry Season	Dasain	Tihar	Other local festivals
Human					
Livestock					

13. Average daily traffic (multiple of current traffic)

	THROUGH TRAFFIC		MAJOR FESTIVALS		
	Wet Season	Dry Season	Dasain	Tihar	Other local festivals
Human					
Livestock					

14. Current bridge toll. If charged, how is toll-money utilised ?

15. Major crops produced in the bridge locality.

16. Has there been more frequent visits across the stream/river than before for tending agriculture by landowners residing on the either side of the river ?

If yes how many landowners

LEFT BANK	RIGHT BANK

17. Increased use of non traditional agricultural inputs after the construction of bridge.

	Increased	As before
Eertilizer		
Seeds		
Pastesides		
Visits by agricultural extension agent		

18. What are the major exports of the area ? Does the group think that there has been any increase in exports of those commodities after the bridge construction ?

19. What are the non-agricultural economic activities in the area (e.g. cottage industry, etc.) ? Has there been any noticeable increase in their production (as a result of easy access to inputs or to market) after bridge construction ? Any increase in the number of households/people in these non-agricultural economic activities ?

20. Is there any component of IRD Program being implemented in the area ?

21. Any new local development program initiated after completion of the bridge (e.g. irrigation channel) ? To the extent of the group's knowledge were they planned before construction of the bridge or after ?

22. Has the bridge faciliated regular supply of food grains and other consumer goods during the wet season ? Has the seasonal price variation stabilised relative to the pre-bridge period ?

23. Have new shops, services, lodges etc. been established after construction of the bridge ? If yes, type, and persons employed.

24. Has there been any displacement of employment (e.g. ferryman) as a result of the bridge ? If yes, how many families/persons ? What are they doing now ?

25. Has access to health facilities improved relative to pre-bridge period (Health post and Hospitals, Ayurbedic clinic, family planning clinic, local faith healers across the stream/river) ? Has the frequency of visits of local people to these facilities increased ?

26. Has access to educational facilities (High School, Middle School, Primary School) increased and more students actually enrolled after the bridge construction ?

27. Has access to administrative facilities increased after the construction of bridge ?

28. Major festivals in the area which take place across the river.

Name of the Festivals	Season

29. Has the bridge facilitated more participation in the festivals ?

30. Do the group feel that there has been more frequent social visits, relegious trips, and frequency of marriage with people across the bridge after construction.

31. Number of local people involved during the bridge construction.

Name of people employed	Duration of employment	
	Days	Months

32. Has the bridge opened up new areas for grazing and for collecting firewood and fodder ?

	Grazing	Firewood	Fodder
Yes			
No			

33. If yes, how much is the time saved than before.

Work	Time saved per work (Approximate hours)
Grazing	
Firewood	
Fodder	

34. After the construction of bridge, how much is the depletion of these traditional resources across the river compared to the pre-bridge period.

	Little	Medium	High
Grazing			
Firewood			
Fodder			

35. Bridge maintenance : Who does the job ? If the bridge is not maintained, why ? Assess the local resources for maintaining the bridge.

36. Local endeavour in requesting and getting the bridge construction approved.

Best Available Document

PROJECT'S BRIDGE LIST

Trail Suspension Bridge
Project No.367-0119

10-700 SERIES BRIDGES

(Figures in N.Rupees)

Annex - 5

No.	Name	Type & Span	River	District	USAID Funding (including Cable)	HMG/N Funding	Total Estimated Cost (Rs)	Physical Progress as of June 1983	Complet Targe
702	Bimire	Suspended 104.6 m	Likhu Khola	Ramechap/ Okhaldhunga	601,962.00	351,116.00	953,078.00	100 %	
705	Madi Khola	Suspended 56.6 m	Madi Khola	Kaski	272,075.77	194,491.00	466,566.77	100 %	
707	Dhungedhara	Suspension 71.8 m	Mugu Karnali	Mugu	1,233,661.30	550,279.70	1,783,941.00	93 %	End FY 1983
708	RimnaGhat I	Suspension 88.6 m	Thuli Bheri	Rukum	1,187,891.00	355,810.93	1,543,701.93	100 %	
710	Jangala Ghat	Suspension 143.8m	Karnali	Surkhet/ Achham	1,455,721.00	572,424.00	2,028,145.00	100 %	
712	Tikhatar	Suspension 98.2 m	Seti	Doti	829,572.49	245,386.27	1,074,958.76	100 %	
713	Seti Ghat	Suspended 151.4m	Trisuli	Gorkha/ Dhading	511,435.85	441,410.15	952,846.00	100 %	
717	Leguwa Ghat	Suspended 310.8m	Arun	Bhojpur/ Sankhuwasaba	2,441,029.75	772,578.25	3,213,608.00	100 %	
718	Nibuwa Banchare	Suspension 64.6m	Tankua Khola	Dhankuta	521,989.39	370,759.61	892,749.00	100 %	
719	Mantholi Ghat	Suspension 124.6m	Tama Koshi	Ramechhap	1,091,528.72	340,532.63	1,432,06..35	100 %	

Note : Walking distance mentioned is one way only.

Source : USAID-N

Bridges Studied

Trail Suspension Bridge
Project No.367-0113

8 - 800 SERIES BRIDGES

(Figures in N.Rupees)

Annex - 5

No.	Name	Type & Span	River	District	USAID Funding (including Cable)	HMG/N Funding	Total Estimated Cost (Rs)	Physical Progress as of June 1983	Completion Target
806	Kokaha Khola	Suspended 139.4 m	Kokaha Khola	Dhankuta/ Sunsari	512,006.00	173,824.00	685,830.00	100 %	Studied Bridge
809	Chaite Ghat	Suspension 134.2 m	Tama Koshi	Dolkha	936,063.80	536,130.47	1,472,194.27	100 %	
812	Kalphu Khola	Suspended 70.5 m	Kalphu Khola	Dhading/ Nuwakot	306,356.70	282,391.50	588,748.20	100 %	
813	Deuli Ghat	Suspension 95.8 m	Marsyangdi	Tanahu/ Gorkha	541,189.16	221,556.84	762,746.00	100 %	
815	Hugdi Khola	Suspension 86.2 m	Hugdi Khola	Gulmi	539,969.30	197,766.01	737,735.31	100 %	
821	Sawa Khola	Suspended 63.8 m	Sawa Khola	Panchthar	366,322.00	520,162.96	886,484.96	100 %	
824	Ramghat	Suspension 158.2 m	Bheri	Surkhet	1,263,618.40	419,610.36	1,683,228.76	100 %	
825	Kuine Ghat	Suspension 235.0 m	Karnali	Surkhet/ Kailali	2,301,061.01	661,549.74	2,962,610.75	52 %	Dec. 1983

Note : Walking distance mentioned is one way only.

Source : USAID-N

Bridges Studied

EAST CONSULT PVT. LTD.

Trail Suspension Bridge
Project No.367-0119

11-900 SERIES BRIDGES

(Figures in N.Rupees)

No.	Name	Type & Span	River	District	USAID Funding (including Cable)	HMG/N Funding	Total Estimated Cost (Rs)	Physical Progress as of June 1983	Completion Target
906	Raighat	Suspension 141.4 m	Arun	Bhojpur/ Dhankuta	1,017,709.10	335,479.00	1,351,188.10	95 %	Oct. 1983
907	Ghopatar*	Suspension 122.2 m	Dudh Koshi	Okhaldhunga/ Khotang	1,125,641.41	413,245.17	1,538,886.58	38 %	End FY 1984
915	Rosi Dovan	Suspension 143.8 m	Sun Kosi	Sindhuli/ Kavre	1,045,443.21	355,996.41	1,401,439.62	42 %	End FY 1984
918	Sitalpati	Suspension 86.2 m	Tama Kosi	Dolakha	501,531.13	300,956.07	802,487.20	100 %	
921	Andhi Khola	Suspension 127.0 m	Andhi Khola	Syangja	676,528.48	283,692.35	960,220.83	100 %	
922	Hungi Ghat	Suspended 228.0 m	Kali Gandaki	Syangja/ Palpa	1,255,201.32	653,471.63	1,908,672.95	100 %	
923	Tipling	Suspended 87.0 m	Kali Gandaki	Myagdi	626,136.31	215,241.14	841,377.45	100 %	
930	Jamu Ghat	Suspension 175.0 m	Bheri	Surkhet	2,815,778.05	954,140.79	3,769,918.84	70 %	Dec. 1983
933	Rimna Ghat II	Suspension 146.2 m	Bheri	Jajarkot/ Rukum	1,308,312.84	370,446.16	1,678,759.00	90 %	Dec. 1983
934	Kuwari Khola	Suspended 96.0 m	Kuwari Khola	Mugu/Bajura	1,105,070.08	294,994.87	1,400,064.95	43 %	End FY 198
937	Jahari Khola	Suspended 68.0 m	Jahari Khola	Rukum	492,636.46	213,682.87	706,319.33	100 %	

Note : Walking distance mentioned is one way only.

Source : USAID-N

Bridges Studied

* Being replaced by Silauri Ghat

Trail Suspension Bridge
Project No.367-0113

Annex - 5

12 - 1000 SERIES BRIDGES

(Figures in N.Rupees)

No.	Name	Type & Span	River	District	USAID Funding (including Cable)	HMG/N Funding	Total Estimated Cost (Rs)	Physical Progress as of June 1983	Completion Target
1000	Sapsu Khola	Suspension 74.20 m	Sapsu Khola	Khotang	585,193.70	259,299.71	844,493.41	100 %	
1003	Rawa Khola	Suspension 110.20 m	Rawa Khola	Khotang	840,921.11	386,534.59	1,227,455.70	65 %	Dec. 1983
1011	Bagmati (Thingan)	Suspended 174.0 m	Bagmati	Makwanpur	694,655.32	422,426.56	1,117,081.88	80 %	Oct. 1983
1014	Bagmati (Naikhandi)	Suspension 129.40 m	Bagmati	Kathmandu/ Lalitpur	782,921.67	821,421.78	1,604,343.45	90 %	Oct. 1983
1015	Bhatauli	Suspended 74.50 m	Bhatauli	Ramechhap	368,969.46	308,991.74	677,961.20	95 %	Sept.1983
1016	Tamakoshi (Amabesi)	Suspended 110.20 m	Tamakoshi	Ramechhap	685,417.56	379,478.24	1,064,895.80	45 %	Dec. 1983
1043	Andhi Khola (Waling)	Suspension 148.6 m	Andhi Khola	Syangja	884,142.67	351,295.35	1,235,438.02	87 %	Oct. 1983
1045	Kuringhat	Suspended 186.20 m	Trisuli	Gorkha/ Chitwan	716,637.02	250,303.24	966,940.36	93 %	Sept.1983
1060	Naya Gad	Suspended 80.00 m	Sano Bheri	Rukum	469,950.07	300,793.92	770,743.99	65 %	Dec. 1983
1061	Purandhara	Suspended 90.00 m	Babai Khola	Dang	335,887.28	376,584.00	712,471.98	79 %	Dec. 1983

Note : Walking distance mentioned is one way only.

Source : USAID-N

Bridges Studied

contd....2/..

Trail Suspension Bridge
Project No.367-0119

12-1000 SERIES BRIDGES

(Figures in N.Rupees)

Annex - 5

No.	Name	Type & Span	River	District	USAID Funding (including Cable)	HMG/N Funding	Total Estimated Cost (Rs)	Physical Progress as of June 1983	Completion Target
1080	Moribagar	Suspension 93.4 m	Taru Gad	Bajhang	888,945.37	505,978.33	1,394,923.70	50 %	Dec. 1983
1082	Fulaut Gad	Suspended 130.30 m	Khrisen Khola	Doti	888,656.78	237,177.22	1,125,834.00	30 %	Dec. 1983

Note : Walking distance mentioned is one way only.

Source : USAID-N

Bridges Studied

ANNEX 6

PHOTO GLIMPES OF BRIDGE SITES VISITED

GALYANG SUSPENSION BRIDGE
OVER
ANDHI KHOLA
921
USAID-ISB PROJECT : 367-0119

PHOTO 1 : A COMPLETE VIEW OF ANDHI KHOLA SUSPENSION BRIDGE NEAR LOWER GALYANG BAZAR.

PHOTO 2 : POOR CONDITION OF THE DECK PLANKS IS CLEARLY VISIBLE. ALSO TRAVERSE JOINTS ARE RANDOMLY PLACED.

PHOTO 3 : TRAFFIC COUNT AND INTERVIEW WITH BRIDGE USERS.

SPAN	: 127.0 m
ESTIMATED COST	: 950,200/ (NRs)
COMPLETED	: July 1981
LOCATION	: 82 Km. FROM POKHARA ON POKHARA BHI A ROAD, AND ½ HR. WALK DOWN HILL.
DISTRICT(S)	: SYANJA

NATIONAL SUSPENSION BRIDGE
OVER
ARUN RIVER
906
USAID-ISB PROJECT : 367 0119

TO 1 : RAIGHAT CABLEWAY LOCALLY MADE. THE PRESENT BRIDGE SITE IS 3 KM DOWN STREAM AT A PLACE CALLED LAMEBAGAR

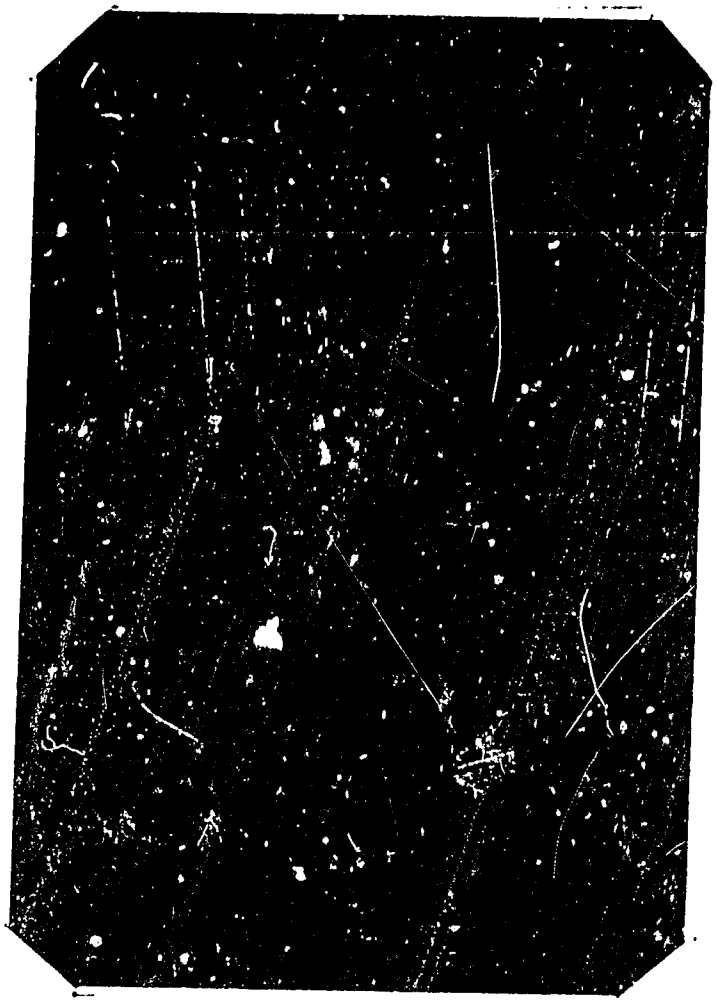


PHOTO 2 : DURING STUDY TEAM'S VISIT BRIDGE DECKING WORKS WERE IN PROGRESS

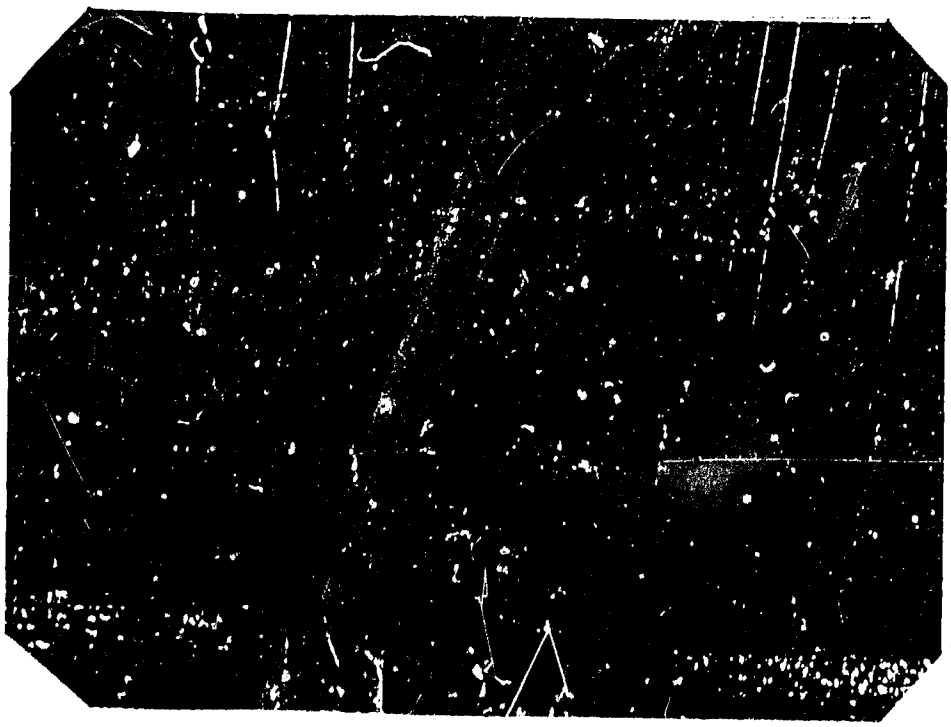


PHOTO 3 : SHOWS WOODEN PLANKS ON OTHER HALF OF THE BRIDGE COMPLETED
NOTE THE TOWER [illegible] RIGHT BANK

SPAN : 141.4 m

ESTIMATED COST : 1,351,200/ (NRs)

PROGRESS : 95% SEPT. 1983

COMPLETION TARGET : OCT. 1983

LOCATION : DHARAN TO CHATRA BY ROAD AND 8 HOURS WALK

DISTRICT(S): BHOJPUR/DHANKUTA

NAIKHANDI GHAT SUSPENSION BRIDGE
OVER
BAGMATI RIVER

1014

USAID TSB PROJECT : 367 - 0119

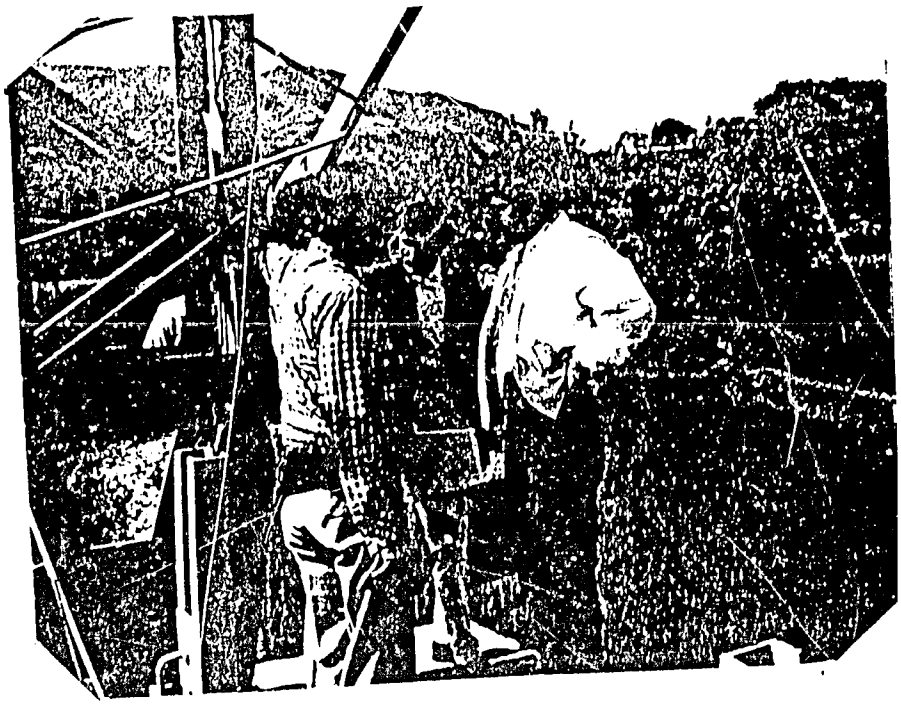


PHOTO 1 : RIGHT BANK : DISCUSSING WITH DISTRICT PANCHAYAT MEMBER MR. SURENDRA B. BASNYAT.

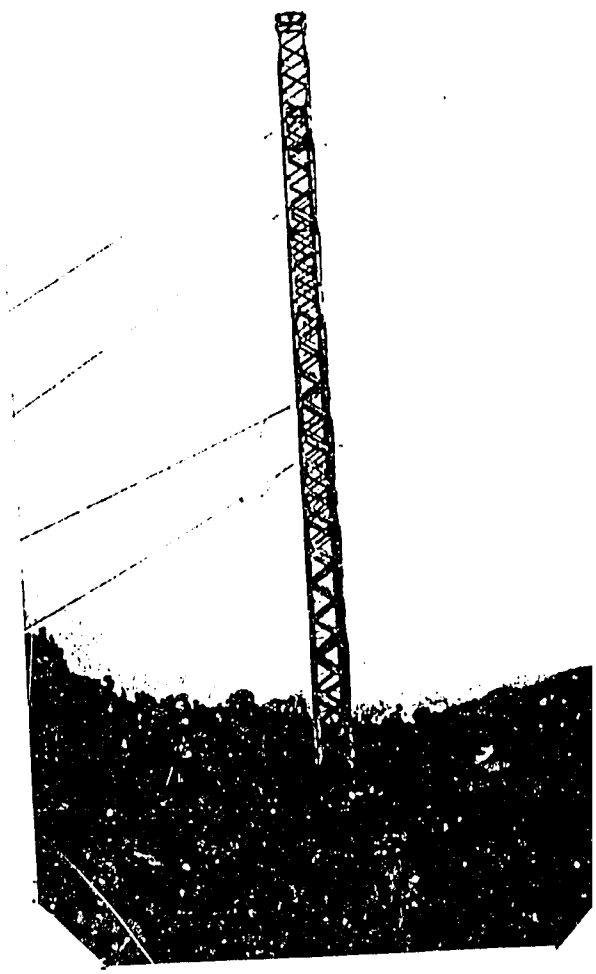
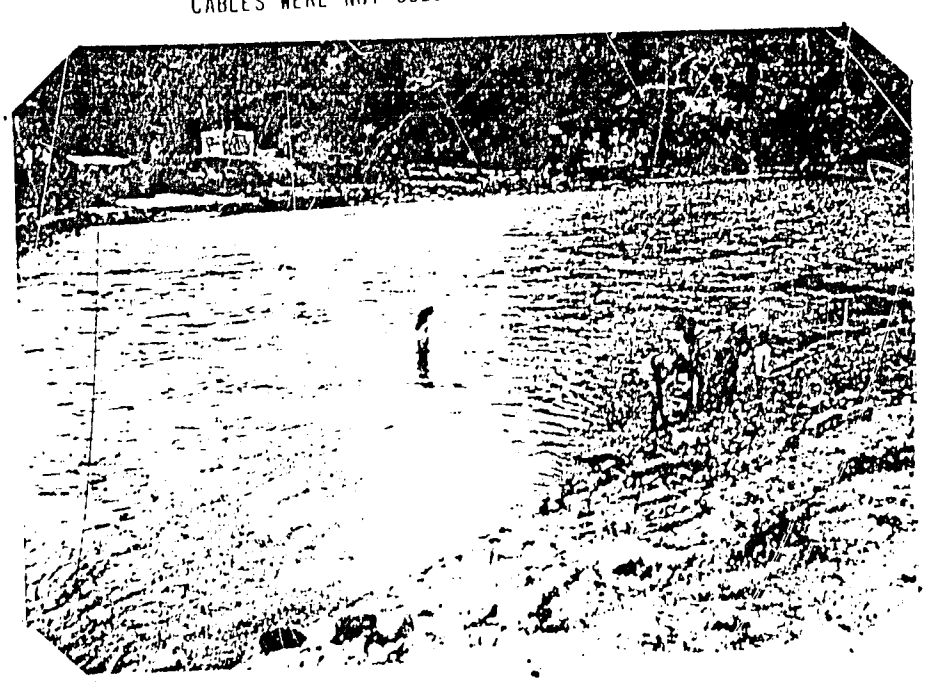


PHOTO 2 : TOWER AT RIGHT BANK STAY CABLES MUST BE FASTENED PROPERLY DURING ERECTION OF HINGED TOWER.

PHOTO 3 : LEFT BANK : MASONARY WORK : TOWER COLLAPSED DURING ERECTION. AS PER LOCAL INFORMANTS: STAY CABLES WERE NOT USED DURING ERECTION.



SPAN : 129.4 m

ESTIMATED COST : 1,604,350/- (NRs)

PROGRESS : 80% AUGUST 1983

COMPLETION TARGET : OCTOBER 1983

LOCATION : kathmandu-Pharping Power House by jeep and 15 minutes walk.

DISTRICT(S) : KATHMANDU/LALITPUR

KOKAHA KHOLA SUSPENDED BRIDGE
OVER
KOKAHA KHOLA
806
USAID - TSB PROJECT : 367-0119

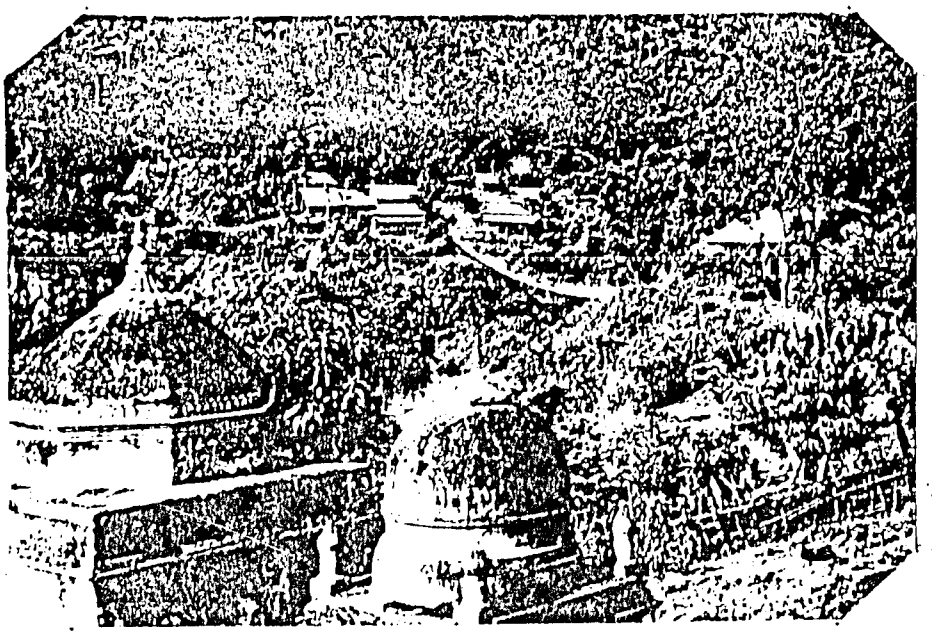
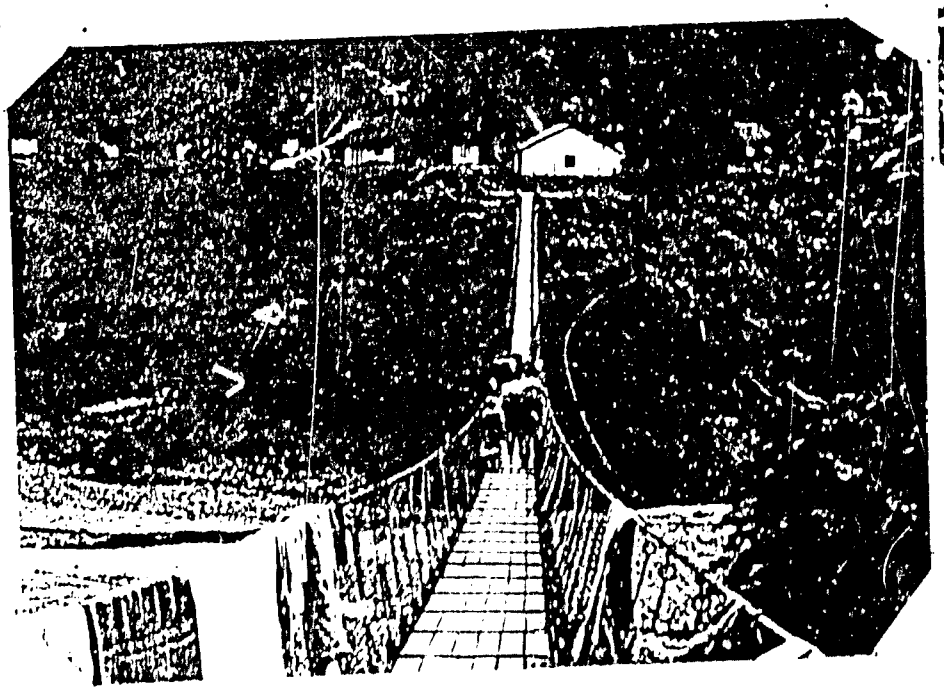


PHOTO 1 : KOKAHA KHOLA SUSPENDED BRIDGE : BARAHA CHHETRA TEMPLE IS ALSO VISIBLE IN THE FORE GROUND.

PHOTO 2 : TYPICAL TOWER - ANCHORAGE SYSTEM OF SUSPENDED BRIDGE

PHOTO 3 : THE BRIDGE LIES IN A MAJOR TRAIL BUT OVER A MINOR RIVER. NOTE NON-LOCAL (PORTERS)TRAFFIC.



SPAN	: 139.4 m
ESTIMATED COST	: 685,850/- (NRs)
COMPLETED	: July '81
LOCATION	: BIRATNAGAR-DHARAN CHAIRA BY ROAD AND 1½ [illegible] WALK FROM CHAIRA.
DISTRICT(S)	: DHANKUTA/SUNSARI

BENIGHAT SUSPENDED BRIDGE
OVER
TRISULI RIVER

713

USAID TSB PROJECT : 367 - 0119

PHOTO 1 : RIGHT BANK : TRAFFIC COUNT

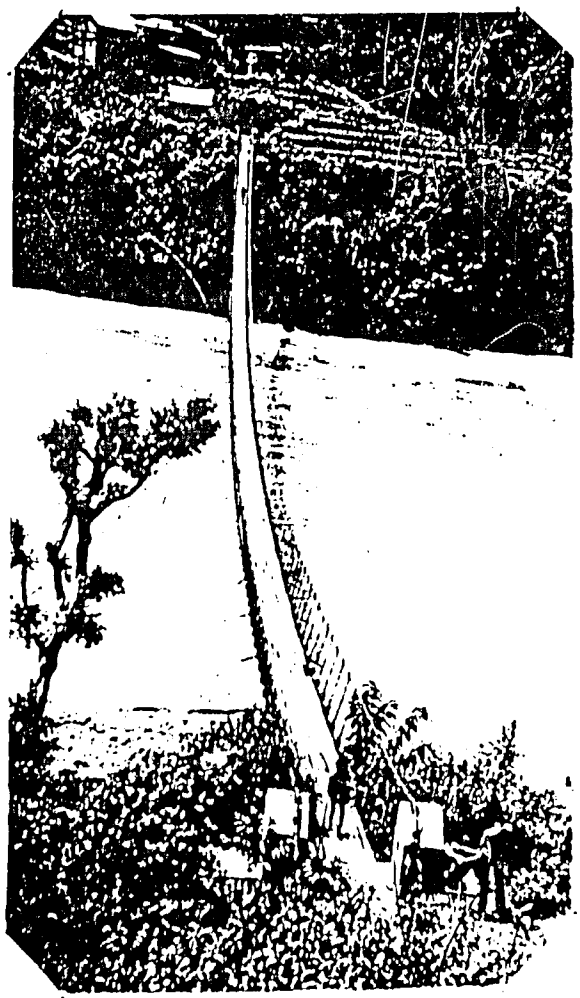
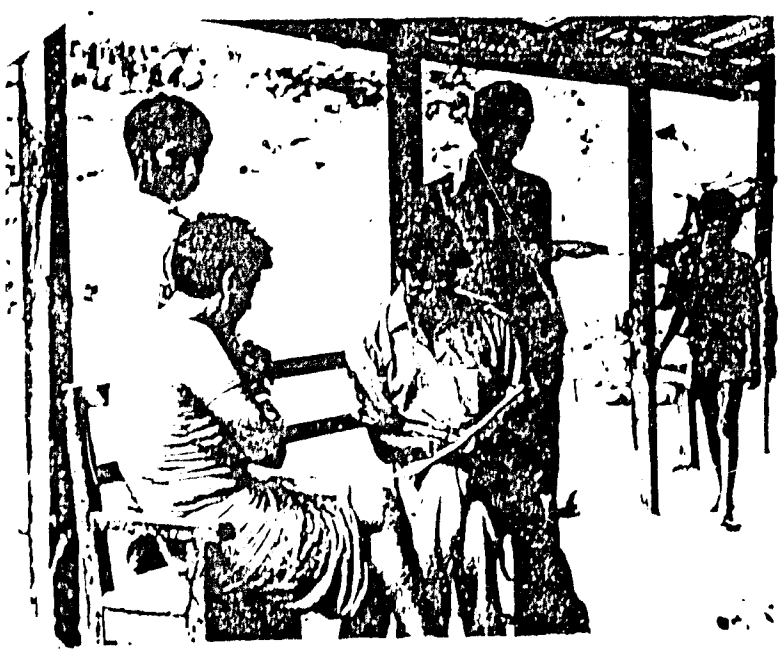


PHOTO 2 : VIEW FROM RIGHT BANK. NOTE NEW SHOPS ON THE LEFT BANK ESTABLISHED AFTER THE BRIDGE CONSTRUCTION AS TOLD BY LOCAL INFORMANTS.

PHOTO 3 : INTERVIEWING WITH LOCAL PEOPLE IN A TEA SHOP IN BENIGHAT BAZAR.



SPAN	: 151.4 m
ESTIMATED COST	: 952,850/- (NRs)
COMPLETED	: August 1979
LOCATION	: 62 KM FROM KATHMANDU ON KATHMANDU POKHARA ROAD
DISTRICT(S)	: GORKHA/DHANDING