PROPOSAL
FOR
A FEASIBLE MAINTENANCE
AND
REPAIR MANAGEMENT SYSTEM
OF THE
RURAL COMMUNITY WATERSUPPLY
AND
SANITATION PROGRAMME

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
REGIONAL DIRECTORATE
POKHARA

PROPOSAL FOR
A FEASIBLE MAINTENANCE AND REPAIR MANAGEMENT OF RURAL COMMUNITY WATER SUPPLY BASED ON PRESENT STATE OF THE WESTERN DEVELOPMENT REGION

by
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ABBREVIATIONS

HMG	His Majesty's Government of Nepal
LDD	Local Development Department (1971-1980)
LDM	Ministry of Local Development (1980-1981)
MPLD	Ministry of Panchayat and Local Development (from 1981)
RD	Regional Directorate
DWSS	Department of Water Supply and Sewerage
DTO	District Technical Office
LDO	Local Development Officer
NDS	National Development Service
SATA	Swiss Association of Technical Assistance
CWS	Community Water Supply
CWSS	Community Water Supply and Sanitation
VMW	Village Maintenance Worker
WSST	Water Supply and Sanitation Technician
BPT	Break Pressure Tank
IC	Interruption Chamber
PDTC	Panchayat Development Training Centre
VP	Village Panchayat

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FOREWORD

This study tries to provide practical advice as well as substantial information on various components of village water supply maintenance, which should guide the Ministry of Panchayat and Local Development to a feasible maintenance and repair management system of its Rural Community Water Supply and Sanitation Programme. The presented proposal is based on the particular situation of the Western Development Region and should be especially of particular use as a reference for the expected policy conference of the Ministry on maintenance.

The authors are field experienced staff members of the Regional Directorate Pokhara, who are interested in improving the current Programme.

Lekh B. Gurung: He has been working as Overseer/Supervisor since July 1976 for Community Water Supply in the Western Development Region. Besides that he is the most experienced staff member in Training Courses. During his 5 years instructor experience he developed two curricula. Once he joined a short term course in Madras, India, on Public Health Engineering and he is interested in studying Civil Engineering.

Walter Schramm: He passed 1977 M.Sc. at Technical University of Munich, Federal Republic of Germany in Civil/Sanitary Engineering where he later got some experience as researcher of the Department of Sanitary Engineering. Since January 1979, he has been working as German Volunteer with the Regional Directorate Pokhara. During that time he performed tasks on various levels on project site and in the office.

Govinda Lal Shrestha
Regional Director
Pokhara, August 1981

Martin Strauss
Project Manager CWSS
Pokhara, August 1981

PREFACE

For ten years Local Development Department, and nowadays the Ministry of Panchayat and Local Development is engaged in executing Community Water Supply Schemes in rural Hill Nepal. These gravity water systems are built by contributions of His Majesty's Government, the particular project village and UNICEF. During that time all over Nepal many projects were implemented and quite a considerable input of expenditure and voluntary labour were utilized for the Programme. The declared policy was mainly to fulfill the immense target of the current 5th year plans but hardly anybody felt really responsible for maintenance after a project was finished.

Last year's conference on the Rural Water Supply Programme, held at Jhapa, recognized the need for a specific policy on maintenance. Hence the conference has recommended that each Regional Directorate should prepare a proposal for a maintenance organization. This should include specific criteria for dividing village level responsibilities and the responsibilities to be borne outside the village, job descriptions, cost estimates, workloads, staff requirements, long term development, existing status of systems, reporting procedures, standard forms, training needs, etc.

The reaction of the Regional Directorate Pokhara was the following Terms of Reference for the authors.

Ministry of Panchayat and Local Development
Regional Directorate
Pokhara

TERMS OF REFERENCE

for long term planning of project maintenance organization for Walter Schramm and Lekh B. Gurung as his counterpart.

OBJECTIVES:

Setting up proposal for a feasible maintenance and repair management system of the rural CWSS projects including:

- working plans, and proposals regarding procedures, manpower, material, office space, and training requirements for initiating first steps towards implementation of such a system.
- evaluation and proposals for improving, if necessary, present project design features, material selection and construction methods in order to render systems better and more easily maintainable.

APPROACH:

In cooperation with MPLD-RD staff and, at appropriate stage, with involved people of MPLD and UNICEF.

A. Assessment Phase

1. Record of completed projects
2. Assessment of present state regarding:
   - maintenance management
   - physical performance and repair requirements
3. Summary of evaluation

B. Working out concept for future maintenance organization including technical and administrative procedures

1. Completed projects and new projects
2. Involvement and responsibilities of Village, District, MPLD-RD and UNICEF
3. Organisational set-up of future system
4. Budgetary requirements
5. Need for revised design, construction and future training.

GENERAL SUMMARY

Some people of MPLD involved in the Community Water Supply Programme felt the very urgent need of a maintenance management concept in order to keep the benefits of completed water systems for the supplied communities, not to discourage the people on development activities and to prevent loss of inputs.

The assessment part of the study shows a positive impact by a well developed standardization. This standardization has been able to switch over repair on structures from major repair, in case of previous regular projects, to village level repair on standardized projects. Still there is an amazing high percentage of construction shortcomings which shows clearly that further training is also needed for experienced staff. It has been evaluated that 50% of completed Water Supply projects have major flaws or are non-functioning. If this success rate is assumed all over Nepal consequently you must agree that e.g. during the 5th Five Year Plan period appr. 23 Mio. Rs (2.3 Karod) out of the LDD development budget for Water Supply have not been properly utilized. A well established maintenance management might well have saved a lot of that amount.

So far maintenance activities are not coordinated. In one third of all projects there is no maintenance performance at all, in the other two thirds very little and insufficient activities have been evaluated. One or two small changes on Regional level towards a maintenance set-up are not enough, and have had only very little effect on present state, e.g. the Village Maintenance Worker Training Course because it is a single activity and not supported by any structure.

The concept for feasible maintenance and repair management is proposed including responsibilities and main procedures on different levels at certain phases - Village Maintenance Agreement, manpower requirement and job descriptions, training requirement, material requirement and tentative budget. If you want to achieve the most effective result, you have to implement all separate points at one time by integrated approach, otherwise it will fail. In the beginning, Plan Phase I and II, responsibility is almost only rested on Village level and Regional level, later at Plan Phase III Districts should take over most of the tasks from Regional Directorates. Each Development Region should establish a Maintenance Section led by one engaged Ass. Engineer. Under him, according to workload, a certain number of Maintenance Supervisors and Maintenance Technicians should be engaged to execute rehabilitation

of projects, major repair and to supervise village level maintenance performance. A Village Maintenance Agreement should continue contract status in the post construction phase as a basis of the concept. Training is not only required for Village Maintenance Worker but also for experienced technicians and office staff of Regional Directorates. In order to enable the authorities to proceed the maintenance set-up, material and budget requirement are split into HMG and UNICEF contribution. During the initial phase only UNICEF is ready to contribute to a CWSS maintenance programme of MPLD; but later the Ministry shall take on the whole contribution and procure materials required for maintenance, reimbursable from UNICEF.

The final decision might interfere with political interest but at least the authors have tried to work out a very practical oriented proposal which emphasizes the benefit of the Community Water Supply Programme to rural people of Nepal.

सारांस

पंचायत तथा स्थानीय बिकाश मंत्रालयका खाने पानी योजना संग सम्बन्धित काम गर्ने सबै जसो कर्मचारीहरू, निर्माण भइसकेका खाने पानी योजनाहरू जो हाल विभिन्न कारण हरूले गर्दा बिग्री मत्की रहेकन्, उनीहरूको मरमत संभार गरी ती खाने पानी योजना बाट जनताले पुर्ण लाभ उठाउन भन्ने कुरामा सहमत भईसकेका छन् । मरमत र संभार तिर ध्यान पुर्‍याउँदा जनता र सरकारको अमुल्य योगदान खेर गर्दा जनतामा विकाश र बिकाश योजना प्रतिको बिचारधाराको प्रतिकुल असर परीरहेको छ ।

एउटा स्तरयुक्त (standardized) कार्यक्रम बनाई निर्मित सबै खाने पानी योजनामा देखापरेका सानो वा ठुलो मरमत संभार समस्याहरू समाधान गर्न सकीन्छ । अहिले सम्म निर्माण भएको धेरै जस्तो योजनाहरूमा प्रसस्त प्राविधिक त्रुटीहरू देखीन्छ । जुन काम गरीरहेका प्राविधिक कर्मचारीहरूको अनभिज्ञताले भएको हो । यसरी ती प्राबिधिकहरूलाई पुन: तालीम दीइ उक्त समस्या समाधान गर्न सकिन्छ ।

यसो हेर्दा ५० प्रतिशत योजनाहरूमा यात ठूली त्रुटीहरू छन् वा तिनीहरू काम गरी रहेका छैन । यदि यस कुरालाई मान्यता दिने हो भने गत पंच वर्षिय योजना कालमा स्थानीय बिकाश विभागले खानेपानी योजनामा गरेको २ दुई करोड ३० तीसलाख रूपैयाको लागनी राम्ररी सदुपयोग भएको छैन भन्ने कुरामा हामीले विस्वास गर्नु पर्छ । एउटा सुनियोजित ढंग बाट स्तरयुक्त कार्यहरू बनाई मरमत संभार कार्य गर्दै गएको भए यसरी खेर गएको पैसा जोगाउन सकिन्थ्यो होला ।

हाल सम्म संभार कार्यक्रम लाई कम महत्व दिएको देखिन्छ । एकातिर एकतिहाई योजनाहरूमा संभार कार्य पट्टी अलिकति पनि ध्यान दिएको छैन भने अर्को पट्टि दुइ तिहाई योजनाहरूमा नगन्य रूपमा संभारकार्य गरिएको देखिन्छ । क्षेत्रीय स्तरमा संचालन गरिएको संभार कार्यका कार्यक्रमहरू पर्याप्त छैनन् । यसबाट हालको स्थितिमा अलिकति मात्र सुधार हुन सक्छ । हाल क्षेत्रीय स्तरमा गाउँलेहरू मध्ये एक जनालाई संभारको लागि तालिम दिने व्यवस्था मात्र छ । यो तालीम एकोहोरो हुन गएको छ । यसरी तालीम प्राप्त व्यक्तिलाई आवश्यक सहायता पुर्‍याउने अर्को कुनै व्यवस्था छैन ।

तसर्थ संभावित मरमत र संभार कार्य व्यवस्था गर्ने विभिन्न तहका कर्मचारीहरूको उत्तरदायित्व र कार्यविधि यस अध्ययनमा प्रस्तावित गरीएको छ । जस्तो कि, गाउँलेहरू संग संभार र मरमत कार्य गर्ने सहमती पत्र बनाउनु,आवश्यक कर्मचारीको व्यवस्था गरी उनीहरूलाई

जिम्मेवार बनाउनु, तालीम व्यवस्था गर्नु, आवश्यक भए सामान खरीद गर्न रकम उपलब्ध गराउनु । यदि सांचिकै निश्चित उपलब्धी हासिल गर्ने हो भने उल्लेखित कुराहरू लाई योजनावध रूपमा एकीकृत गरी संचालन गर्नु पर्छ । अन्यथा असफलता मात्र हात लाग्छ ।

सब भन्दा पहिले, योजनाको प्रथम र दोश्रो चरणमा सबै जिमेवारी गाउं पंचायत र क्षेत्रीय स्तरमा निहित हुनु पर्छ । त्यस पछि योजनाको तेश्रो चरणमा सबै जिमेवारी क्षेत्रीय स्तरबाट जिल्ला स्तरमा सारिनु पर्छ । प्रत्येक क्षेत्रीय निर्देशनालयमा सहायक इन्जीनियरको नेतृत्वमा एउटा मरमत र संभार गर्ने शाखा खडा गर्नु पर्छ । उक्त शाखामा काम गर्ने केही सुपरिवेदाक र टेक्नीसियनको व्यवस्था हुनु पर्छ । जसले योजनामा गई त्यहां देखा परेका प्रत्येक समस्या समाधान गरी, मरमतको लागि गाउंलेहरूले चाहिने काम गरेका छन् वा छैन निरिक्षण समेत गर्नु पर्छ । गाउं स्तरको मरमत र संभारको लागि बनाउने सहमति पत्र योजना सिधीन लाग्नेको बेलामा गर्नु पर्छ । तालिमको आवश्यकता गाउंले लाई मात्र नभै क्षेत्रीय निर्देशनालयका कर्मचारीहरू समेत लाई दिनु पर्ने आवश्यकता देखिन्छ । यसरी तालिम पाएको व्यक्तिहरूले मरमत र संभारको जिम्मेवारी वहन गरी त्यसलाई कार्यरूप दिन मालसामान जुटाउन, श्री ५ को सरकार र युनिसेफ बाट प्राप्त हुने सहयोगहरूको छुट्टा छुट्टै योजना बनाउनु पर्छ । अहिले प्रत्येक चरणमा युनिसेफ ले पंचायत तथा स्थानीय विकास मन्त्रालयको खाने पानी योजनाहरूको मरमत र संभारमा सहयोग गर्ने पुर्ण रूपमा तैयार रहेको कुरा बुझिन्छ । तर पछि मन्त्रालयले सम्पूर्ण अभिभारा वहन गरी मालसामानको लागि युनिसेफ को सहयोग लिनु पर्ने देखिन्छ ।

अन्तिम निर्णय जे भए पनि अध्ययनकर्ताले व्यावहारीक योजना प्रस्तावित गरेको छ । जसबाट सांचिकै नै नेपालका ग्रामीण जनताको लागि आवश्यक ठानेको खानेपानी योजना बाट गाउंलेहरूले पूर्ण लाभ उठाउन सक्छन् ।

1. INTRODUCTION

1.1 Rural Water Supply in Hill Nepal

It might be really not necessary to justify the general need of Rural Water Supply.

Probably the two most well-known Government Agents for Rural Water Supply schemes in Remote Areas are the Department of Water Supply and Sewerage (DWSS) and the former Local Development Department (LDD), now Ministry of Panchayat and Local Development (MPLD).

DWSS is responsible for providing water supplies to communities over about 1500 inhabitants, district or zonal headquarters and other urban areas outside the jurisdiction of Water Supply and Sewerage Board (WSSB): The Jhapa Conference 1980 agreed on a guideline of 300 - 1500 people as suitable for MPLD projects (3). Besides that, smaller drinking water projects are executed by the District Technical Office (DTO) which is under responsibility of the recently created Local Development Officer (LDO) Administration. The implementation of water systems are also an important conceptional output of Integrated Development Projects but they follow again somehow an other official procedure.

If you walk in the hills you occasionally might pass by well built drinking water projects built with the help of non-governmental organizations like the British or Indian ex-servicemen associations, United Mission or others.

Small water projects have been built also by NDS programmes or self-help activities by villagers who did not know official procedures or who did not succeed through official channels.

So far not much coordination of these various activities regarding implementation of water supply schemes is seen. After a few years the LDO Administration might be able to coordinate all development programmes in its district, which is also an important requirement for any maintenance activity.

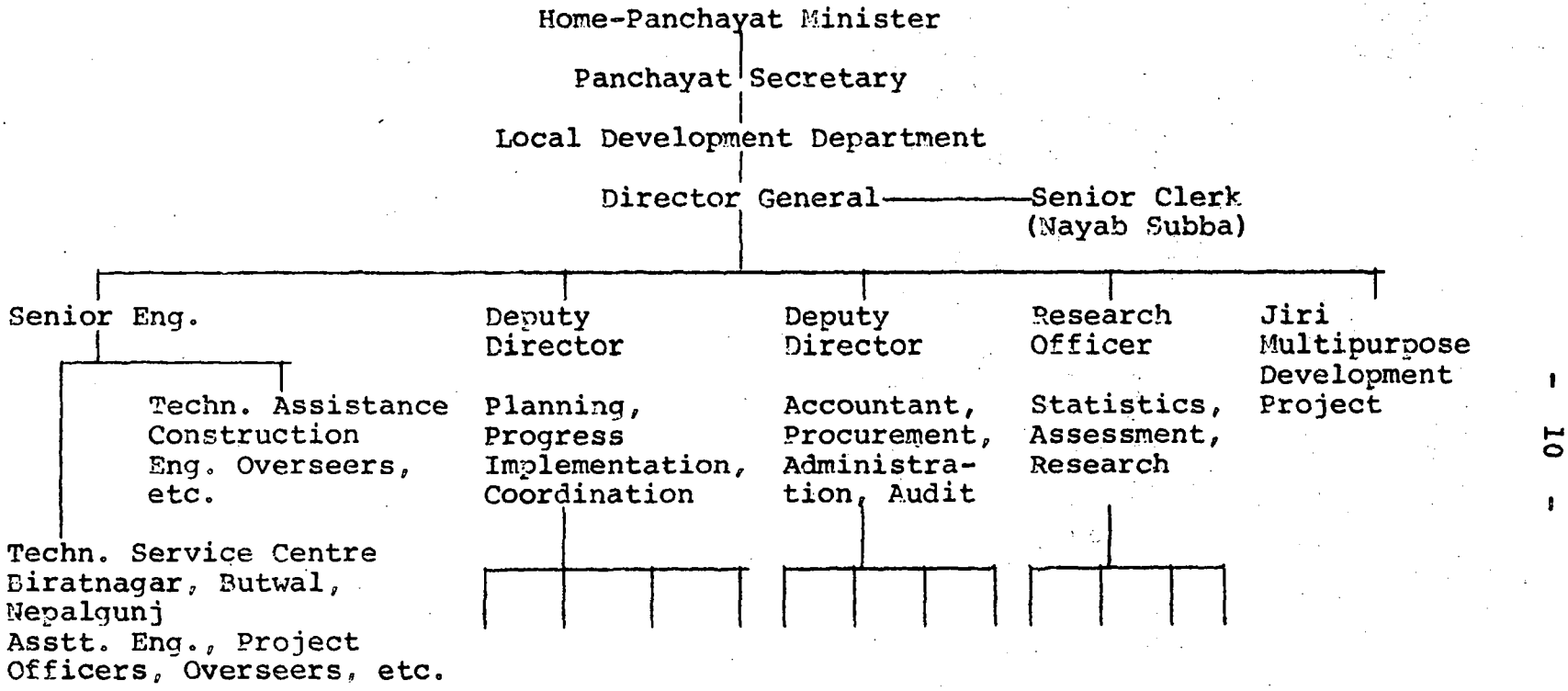
1.2 History of the CWSS programme

The 3rd and 4th National Development Plans, 1965 to 1970 and 1970 to 1975, laid strong emphasis on the development of rural water supplies.

Before LDD was established in 1971 Rural Water Supply Projects were executed by the Community Water Supply Division, Department of Irrigation and Water Works. Then in 1971 a supplementary programme for piped water supply to rural communities was initiated with UNICEF and WHO assistance. Responsibility for that programme was given to the newly formed Remote Area and Local Development Department subsequently re-named Local Development Department.

Right in the beginning many different types of projects well considered like channels, fish-ponds, suspension bridges, latrines, wells, water systems, school buildings, play-grounds, handicrafts and small scale industries, etc. Projects have been divided in village level, town level and district level projects. It was explicitly said that the concerned Village, Town or District Panchayat was fully responsible for protection and maintenance after completion of a project (1,8). In 1971 LDD was going to open Regional Offices in Biratnagar, Nepalgunj and Butwal. At that time the organization chart, shown in figure 1, was published (1).

FIGURE 1 : LDD Organization Chart, 1971



In 1973/74 the LDD Regional Office for the Western Development Region was shifted from Butwal to Pokhara. About 50 water supply schemes had been completed throughout the country at the end of 1975. One year later, out of the grand total of 70 officially listed projects, 32 CWS projects had been built in the Western Development Region.

LDD's main objectives for the 5th five year development plan (1975/1980) were (2):

- To provide safe and adequate water supplies to selected communities
- To train personnel at professional and sub-professional levels for the continuation and the expansion of the programmes
- To initiate rural water supply programme in the Terai involving:
  a) protection of existing wells against pollution, and
  b) sinking tube wells and equipping them with hand-pumps
- To collect data for the planning of environmental health programmes
- To encourage limited research activities in specific fields with a view to reducing the cost of community water supply and sanitation facilities and/or enhance their usefulness.
- To prepare typ designs, manuals and guidelines for surveys and designs
- To encourage district panchayats and "class organizations" to include community water supply and sanitation in their development programmes.

In mid-1976 the highly requested "Noted" programme started which included the following districts: Kaski, Lamjung, Syangja, Gorkha, Tanahun and Parbat in the Western Development Region. At the same time Swiss Association for Technical Assistance (SATA) stepped into the Community Water Supply Programme of LDD Pokhara to execute the Noted Programme.

Besides that new programme, the regular programme continued. It was executed in the same way as noted projects but not under the supervision of SATA Engineers.

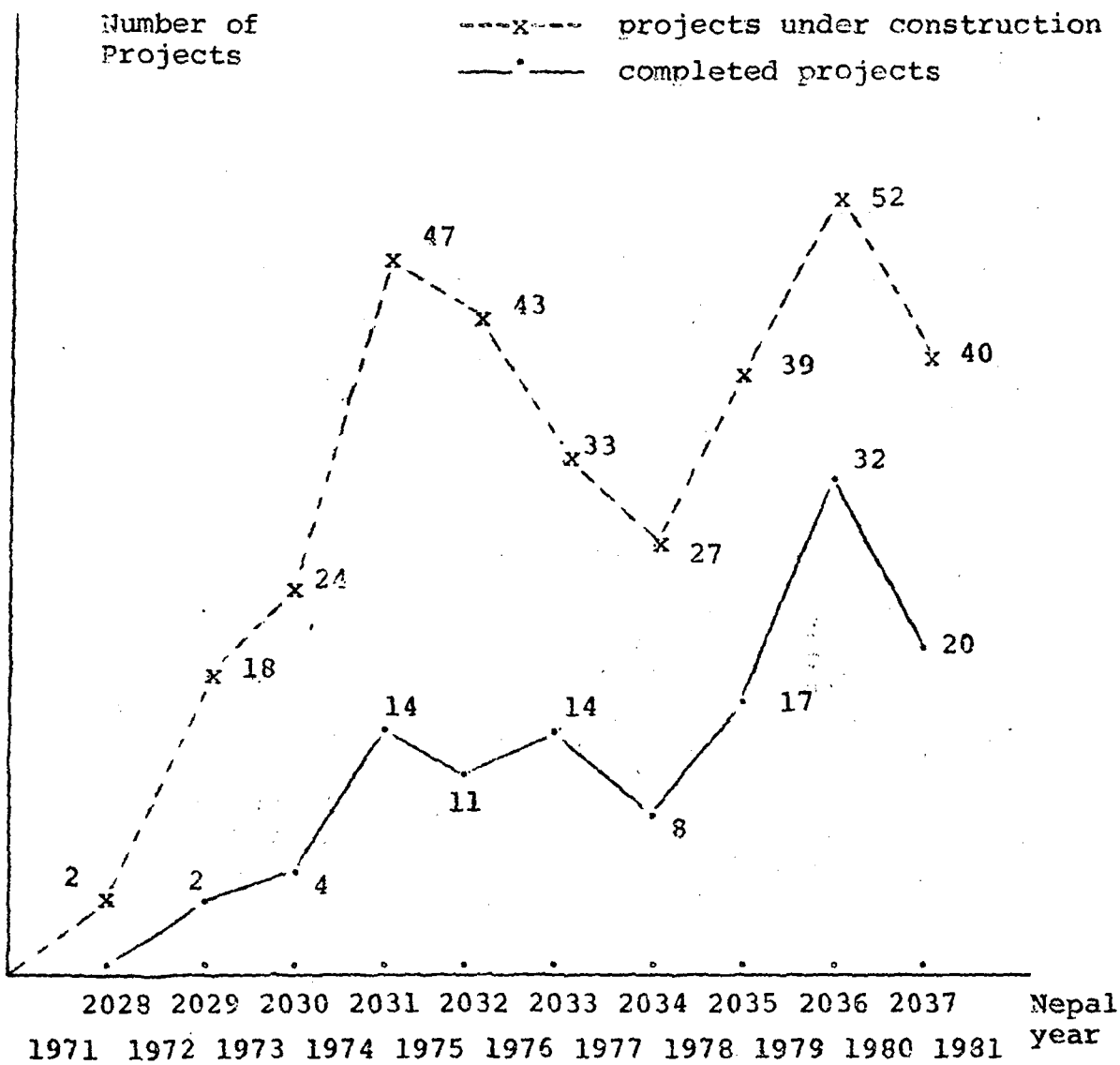
Because Kaski District was declared as pilot district for development activities by HMG until 1973 mainly noted projects were given to this district first.

Projects in the Western Development Region got the same status as noted Projects under technical and administrative management of LDD Pokhara.

But this important achievement is undermined by the so-called "Phuthra" projects (self-help projects), which have started about 1975 and still carrying on. NDS-programme which was involved in CWS too from 1977 to 1979 should be judged in the same way. For these kind of projects no technical manpower from RD is involved. Also there is neither a proper procedure nor any control. What to do in case of maintenance for that type of projects? From the authors there will be no answer.

It is very easy to find targets for the CWSS Programme but to evaluate what is really achieved is rather difficult. We searched for a quite a while to compile a project list of all completed CWSS projects executed by LDD/MPLD in the Western Development Region, see Annex 1. However there are still some doubts whether the list is really perfect. Figure 2 shows annually the number of projects under construction and completed in the Western Development Region for each year between 1971 and 1980.

FIGURE 2 Number of CWSS Projects Under Construction and Completed Projects in the Western Development Region from 1971 to 1980



So far nothing has been said about Sanitation because only one school latrine building was erected by MPLD-RD Pokhara. Besides that there were some uncoordinated activities of several technical staff in CWS project villages. Recently a Sanitation Team was established in RD Pokhara which should set-up a Sanitation Programme including procedures, management, training requirements,

etc. During the recent Village Maintenance Worker (VMW) Training Course and Water Supply and Sanitation Technician (WSST) Training Course Sanitation was introduced as a main subject, and pit latrines have been built by the trainees. Of course the Sanitation Team should also suggest something on maintenance. If it is necessary to include Sanitation Maintenance in the CWS maintenance concept, that should not be a problem adding Sanitation to the CWS maintenance management set-up later.

1.3 General Issues regarding CWS Project Maintenance

Maintenance is the most seriously neglected aspect of the CWS Programme. The recent technical evaluation of 45 CWS projects by the authors, as well as the New ERA evaluation, 1977, of another 29 projects, built in the Western Development Region, indicate that a high percentage of systems are in extremely bad condition. Besides what is written down in proposals, papers and contracts not much attention is given to the post-construction phase. Trying to fulfill over-estimated targets is still the case with the CWSS Programme in Nepal. Because of this major policy on quantity, little priority is given to quality. Quality does not mean only appropriate and solid construction, but also it includes the main reason why a system is actually built: serving drinking water permanently to the villagers. The present policy of implementing projects seems still to involve handing projects over to unprepared villagers and leaving them alone without any support. This has already caused many breakdowns in the past, often only one or two years after construction was finished.

What is the benefit to the people after their water system is broken down? There is none. It can also lead to discouragement with side effects on other development programmes. We have to ask for a new aim in MPLD policy:

WELL-RUNNING PROJECTS, INSTEAD OF ONLY FINISHED ONES.

If we agree on that, our next question must be:

HOW CAN WE ENSURE WELL-RUNNING PROJECTS?

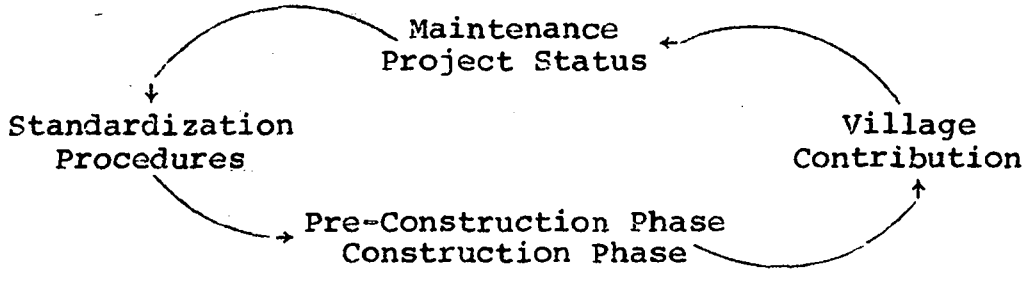
There are many links and influences affecting the status of old projects e.g. structure and procedures of MPLD, divided responsibilities at national, regional, district and village level, selection and priority, performance

during construction and pre-construction phase, which influences village contribution. Another question which arises is: who should be responsible at village level? In general, on the one side, village Panchayats do not show their interest, and it seems that on the other side there is a fashion to set up a special committee for each programme like school; irrigation; afforestation etc., which may be over taxes the capacity of villagers. The MPLD policy set-up must consider the real present status and the practical capability of its instruments. There is no point in continuing to construct new systems if they are just going to break down.

At present there is no system of neither routine maintenance nor repair maintenance for village water supply projects. In practice we found that repair of leaking systems or breakdowns, take place on an ad hoc basis, if at all. We found, in fact, that the expectation that villagers will maintain their system because they have contributed to it and feel that they own it is over-optimistic. This, however, is more a criticism of the expectation than of the villager, because in practice, neither the question of legal ownership nor the question of who is particular amongst the villagers should attempt to maintain the system is clearly specified.

If you look at the maintenance circle, figure 3, you can see the links with other issues of the CWS Programme. Project status and maintenance are feed back of programme implementation which probably requires improved standards and procedures for better execution and village contribution which ends up again in an advanced post-construction phase. Maintenance is no longer the end of a row, but an integral part of a circle, and therefore also able to give important inputs to the whole programme.

FIGURE 3 : Maintenance Circle



It might be argued that the villagers' willingness to maintain the supply once it is installed is a better measure of their desire to have a supply. A study of the non-technical factors regarding CWS project maintenance or village level is very essential. A pure technical approach is obviously quite easy but not sufficient because maintenance has to base on certain village contribution and responsibility. Take an example, a project village got a complete tool-kit for village level maintenance, but after a few months almost all tools disappeared. We strongly recommend such an evaluation, which was impossible to execute in the first half of 1981. We prepared a Draft of Terms of Reference for such a village case study for a feasible maintenance management set-up of Community Water Supply Projects on Village Level, see Annex 2. Such a study is outstanding, but we present straight away a tentative proposal also for village level maintenance management.

1.4 Methodology

The findings compiled and summarized in the assessment of present state are based upon inspection of 45 completed CWS in the Western Development Region. Besides that on several levels structured and unstructured interviews have taken place in order to understand different positions and find possibilities for a feasible organisational set-up.

Table 1 shows the different instruments of our investigation with particular objectives.

TABLE 1 : Instruments and its Objectives of the Study

Instrument	Objective
Technical evaluation	technical status repair workload village maintenance performance quality of the Standardization construction performance
Staff interview	village participation project execution training needs office capability/awareness administrative handling

(CONTINUED)

TABLE 1 (Cont'd)

Instrument	Objective
VHW Training Course '81 HST refresher Training Course '81 interview and teaching	village maintenance performance village participation training needs village maintenance capability construction performance
RD Biratnagar, visit	performance standardization maintenance ideas
District (LDO/DTO) interviews	capability of DTO CWS District project execution awareness of maintenance
DWSS Regional Office Pokhara visit	maintenance ideas project management
UNICEF/MPLD staff discussions	project policy maintenance policy MPLD structure
desk study	LDD/MPLD history, policy and structure/project performance maintenance ideas procedures
Village Case Study (not yet done)	village maintenance capability responsibility of local organizations general understanding of maintenance possibilities of payment implementation

2. ASSESSMENT OF PRESENT STATUS

Between November 1980 and April 1981 most of the MPLD-RD evaluations were done by using a slightly changed version of the New ERA questionnaire from 1977, see Annex 3. Table 2 compiles all evaluations done in the Western Development Region so far. There was actually no selection based on any specific criteria because right in the beginning no proper information was available at all.

TABLE 2 : Number of Completed and Evaluated CWS Projects per District, State June 1981

Zone	District	Completed Project	New ERA Evaluation	MPLD-RD Evaluation	Total evaluated
Dhaulagiri	Baglung	6	2	0	2
	Mustang	9	5	0	5
	Myagdi	12	5	0	5
	Parbat	14	6	6	12
	Total	41	18	6	24
Gandaki	Gorkha	14	7	0	7
	Kaski	37	6	20 *)	23
	Lamjung	6	0	0	0
	Manang	4	0	1	1
	Syangja	11	0	9	9
	Tanahun	11	0	0	0
	Total	83	13	30 *)	40
Lumbini	Argha Khachi	1	0	0	0
	Gulmi	2	0	2	2
	Nawal Parasi	1	0	1	1
	Palpa	7	1	6	7
	Total	11	1	9	10
TOTAL		135	32	45 *)	74

*) 3 projects of New ERA additionally again evaluated.

It was decided not to include the New ERA evaluation (7) in detail again because these records from 1977 cannot be used for an assessment of present state. The results are properly compiled, published and known to concerned MPLD staff. But even so that study is very useful especially standing comparison with this MPLD-RD evaluation and its recommendations regarding non-technical matters.

The assessment part is divided in two main chapters, presenting first the technical status and followed by the present arrangements on maintenance management and organization.

2.1 Technical State of Particular Structures

This section of our project evaluation focuses on more specific details of the technical state of particular structures. The assessed 45 projects comprise of 27 schemes built according to the Pokhara Standardization implemented first by SATA Engineers from about 1977, and 18 previous regular projects built without any technical guidelines. This analysis might answer at least: what the effect of the performed Standardization is in keeping a water system in good condition. It might show progress achieved as well as still weak points of the present standard designs. Another reason for that classification is because right in the beginning there was hardly any training, but after the noted project programme started Water Supply Technicians have been trained on the Standardization. Therefore, we should expect better performance of construction work now than in previous regular projects.

Each structure was evaluated in design, construction, and maintenance by general assessment: 'satisfactory', 'some shortcomings' or 'serious shortcomings'. The assessment was given after an inspection of that particular structure. In addition the necessity of repair was judged in the following specifications: 'none', 'village level', 'major' or 'rehabilitation'. 'Village level' repair means that the VMW should be able to repair the construction but maybe he needs little cement (e.g. tank leak) or a few small fittings from RD. 'Major' repair is understood as serious input of materials e.g. e bags cement, fittings, slab frames, etc. 'Rehabilitation' repair is defined as almost or completely broken down structure which requires reconstruction.

2.1.1 Spring/Stream Catchment

Water from a spring or stream is the basis of the water supply project but sometimes the adequacy of the source is really poor. Refer to table 3.

TABLE 3 : Adequacy of Sources

	18 previous Regular Projects	27 Standardization Projects	Total 45 projects
Adequate supply of water year round	6	15	21 47%
Supply only seasonally adequate	10	11	21 47%
Supply inadequate year round	2	1	3 7%

A survey rule is that the survey should be done only in the driest season, and that during preliminary survey the yield should be measured too. But in reality the survey teams set out sometimes out of the season. This caused serious water problems in at least some projects. Sufficient vegetation in the watershed area prevents erosion and is as well mostly a guarantee that the source does not dry up. In almost 50% of the evaluated projects the vegetation around the source is assessed insufficient. Consequently, afforestation should be included in the CWS Programme for conservation of sources where necessary.

Each spring or stream is unique. Hence actually you cannot draw a standard design except for the intake chamber. In addition four detailed questions of the evaluation questionnaire are shown in table 4 because the catchment construction is the most difficult. The interpretation of table 4 might give the impression that the Standardization does not have much effect on proper construction. At least water collection and cleaning possibilities have been improved, but an unusual high number of leaks have been noticed especially in Standardization projects.

TABLE 4 : Detail Assessment of Spring/Stream Construction

	18 previous Regular Projects		27 Standardization Projects		Total 45 projects	
Construction of water collection not well built	11	61%	8	30%	19	42%
Not easy access for cleaning	10	56%	8	30%	18	40%
Intake not free of slime or animal life	9	50%	12	44%	21	47%
Catchment not free of leaks	6	33%	16	59%	22	49%

If you look at table 5 and 6, you can recognize a slightly improved design, little progress in construction but still the maintenance is very poor. For approximately 70% of all projects the repair workload depends on assistance and inputs from outside the village. Spring/stream catchments are in general strange buildings for simple villagers but even WSSTs still have serious problems in constructing a proper catchment. The need of better supervision and further training is obvious. If you want an improved catchment status you must be sure that the Supervisor is on site during construction and all the training for technical staff should include a more comprehensive discussion of spring and stream catchment patterns. From a VMW you can probably only expect him to clean the catchment weekly and repair small leaks, if he gets some cement.

TABLE 5 : Assessment Spring/Stream Catchment

	18 Previous Regular Projects			26 Standardization Projects		
	satis-factory	some short-comings	serious short-comings	satis-factory	some short-comings	serious short-comings
Design	9	6	3	20	6	1
Construction	5	7	6	11	13	3
Maintenance	1	7	10	3	10	14

TABLE 6 : Repair Necessity of Spring/Stream Catchment

	18 Previous Regular Projects		27 Standar-dization Projects		Total 45 projects	
None	1	6%	2	7%	3	7%
Village Level	4	22%	8	30%	12	27%
Major	6	33%	15	56%	21	47%
Rehabilitation	7	39%	2	7%	9	20%

2.1.2 Reservoir Tank

The Standardization was a very important step in order to maintain the reservoir tank. Table 7 shows a clear picture of progress. Some shortcomings are mainly caused by leaks and the old standard manhole cover without slab frame. Repairs of non-standard tanks are necessary especially in roofing, flow regulation, wall construction and ventilation.

TABLE 7 : Assessment Reservoir Tank

	17 Previous Regular Projects			26 Standardization Projects		
	satis-factory	some short-comings	serious short-comings	satis-factory	some short-comings	serious short-comings
Design	10	3	4	25	1	0
Construction	5	9	3	15	11	0
Maintenance	0	10	7	5	18	3

According to table 8 the Standardization switched the repair load from major repair to village level repair. If the reservoir tank is without leaks there is no problem at all for a VMW to take care of a reservoir tank.

TABLE 8 : Repair Necessity of Reservoir Tank

	17 Previous Regular Projects		26 Standar-dization Projects		Total 43 Projects	
None	0	0%	4	15%	4	9%
Village level	2	12%	17	65%	19	44%
Major	13	76%	5	20%	18	42%
Rehabilitation	2	12%	0	0%	2	5%

2.1.3 Break Pressure Tank and Interruption Chamber

First of all the Interruption Chamber (IC), shown in the Pokhara Standardization and performed sometimes between spring and reservoir tank, is technically not needed at all because of the open system in this part of the pipeline. Pressure can be reduced by higher headloss of a smaller pipe diameter.

Before the Standardization was implemented serious shortcomings have occurred to Break Pressure Tanks (BPT),

see table 9 and major or rehabilitation repair is required (table 10). In case of standard designed BPT and IC the assessed status is judged quite well. Even so, it is very difficult to repair anything on a float valve if something is wrong. The recently improved BPT standard design has recognized this maintenance **demand already by an extra manhole above the float valve.**

TABLE 9 : Assessment of BPT and IC

	17 Previous Regular Projects			15 Standardization Projects		
	satis-factory	some short-comings	serious short-comings	satis-factory	some short-comings	serious short-comings
Design	1	6	0	15	0	0
Construction	1	1	5	1	11	3
Maintenance	0	0	7	0	10	5

TABLE 10 : Repair Necessity of BPT and IC

	7 Previous Regular Projects		15 Standar-dization Projects		Total 22 Projects	
None	0	0%	1	7%	1	5%
Village Level	0	0%	8	53%	8	36%
Major	3	43%	5	33%	8	36%
Rehabilitation	4	47%	1	7%	5	23%

2.1.4 Valve and Valve Chamber

The operation and maintenance of valves and valve chambers is still a technical problem. Previous regular projects are without any stop cocks for tap flow regulation. Air valves have not been built or so poorly constructed that none has been working. Cleaning outs are seldom built and covers are broken or non-existent. After the Standardization was implemented the new design

effected the present status a bit, but still there are some or serious shortcomings regarding maintenance in 26 of 27 projects. You can see broken old standard covers, bolts which do not fit, not removeable covers, deep and narrow as well as flooded stop cock chambers.

What can a VMW do with incomplete tools, no brass unions, no bolts, etc.? If you have a look at table 11 and 12, you might be convinced that there is still serious input required from RD. The present standardization has to be improved urgently but besides that RD Pokhara should teach its technicians how to prevent mistakes.

TABLE 11 : Assessment of Valve and Valve Chamber

	18 Previous Regular Projects			27 Standardization Projects		
	satis-factory	some short-comings	serious short-comings	satis-factory	some short-comings	serious short comings
Design	2	9	7	24	3	0
Construction	0	8	10	10	11	6
Maintenance	0	2	16	1	12	14

TABLE 12 : Repair Necessity of Valve and Valve Chamber

	18 Previous Regular Projects		27 Standar-dization Projects		Total 45 Projects	
None	0	0%	4	15%	4	9%
Village Level	0	0%	10	37%	10	22%
Major	5	28%	12	44%	17	38%
Rehabilitation	13	72%	1	4%	14	31%

2.1.5 Pipeline

The chosen pipeline route causes only exceptional damage to a water system like in case of previous performed

handlevel surveys which were not checked. At least for the evaluated projects landslides are very much a minor problem. But almost all river crossings in old regular projects have been inadequately constructed. The most common shortcoming is an exposed or not deeply enough laid pipeline. Sometimes ignorant villagers effect these projects badly by malicious or other damage. In quite a few old projects, however, bad pipe quality might be the reason why the VMW cannot properly re-join the pipe. It seems that detailed survey, better pipe quality, more experienced WSSTs and the supervision system established in 1979 improved the quality of pipe construction, see table 13.

TABLE 13 : Assessment of Pipeline

	18 Previous Regular Projects			27 Standardization Projects		
	satis-factory	some short-comings	serious short-comings	satis-factory	some short-comings	serious short-comings
Design	10	5	3	25	2	0
Construction	1	8	9	16	9	2
Maintenance	0	5	13	1	20	6

Village level repair means almost leak repair only. In case of major repair some HDP pipe or GI pipe is required. A new pipeline route or complete re-construction of a broken down PVC piped system might be understood by rehabilitation repair, shown in table 14.

TABLE 14 : Repair Necessity of Pipeline

	18 Previous Regular Projects		27 Standar-dization Projects		Total 45 Projects	
None	0	0%	4	15%	4	9%
Village Level	6	33%	19	70%	25	56%
Major	7	39%	4	15%	11	24$
Rehabilitation	5	28%	0	0%	5	11%

2.1.6 Tapstand

Daju, Bhai, Didi, Bahini harulai, for everybody a tapstand is built. It is the most important place of a Water Supply Project after its completion. If a tapstand provides clean water and the structure is in good repair everyone is pleased. But the reality is shown by the outcome of this MPLD-RD Pokhara evaluation (see Table 15).

What are the reasons and causes of that miserable status? Finding technical reasons only does not satisfy. The origin of inadequate flow may be a cut, a block in the pipeline or a design mistake. Say all tapstands of old regular projects do not have stop cock regulations, which might be the reason for inadequate flow on other taps as well. Broken brass taps heavily effect a water system. If two or three brass taps are out of order, the project becomes an open system which causes inadequate supply to all tapstands and makes the reservoir tank useless, if a villager does not regulate it daily.

TABLE 15 : Detail Assessment of all Evaluated Tapstands

	18 Previous Regular Projects 177 tapstands		27 Standardization Project 186 tapstands		Total 363 tapstands	
tap does not provide adequate flow	73	41%	46	25%	119	33%
stop cock is not functioning/not built	167	94%	61	33%	228	63%
stop cock chamber not well covered/ not built	168	95%	58	31%	226	62%
tapstand in bad repair	114	64%	15	8%	129	36%
area not properly paved	101	57%	3	2%	104	29%

(CONTINUED)

TABLE 15 (Cont'd)

	18 Previous Regular Projects 177 tapstands		27 Standardization Project 186 tapstands		Total 363 tapstands	
waste water not properly drained	116	66%	11	6%	127	35%
runoff water productively used	11	6%	6	3%	17	5%
(brass) tap is not working	114	64%	65	35%	179	49%

According to our evaluation of more than 350 tapstands 50% brass taps are not working, worn out, broken down or removed. The fact of broken brass taps shows very obviously the quality of villagers' awareness in taking care of their water supply system. It might be the best general barometer of their responsibility towards maintaining the project.

Stop cock chambers must be improved. They are one of the worst points in the detail assessment list. The present stop cock chamber is expensive and too narrow for any maintenance. Proposed is the standard GI pipe-valve protection used in RD Biratnagar and RD Nepalgunj. Because of the actual tapstand position it seems sometimes sensible to be a little bit more flexible on the Standardization.

TABLE 16 : Assessment of Tapstand

	18 Previous Regular Projects			27 Standardization Projects		
	satisfactory	some shortcomings	serious shortcomings	satisfactory	some shortcomings	serious shortcomings
Design	6	10	2	27	0	0
Construction	1	13	4	15	10	2
Maintenance	0	4	14	3	13	11

Interpretation of table 16 leads to the conclusion that the bad status in previous old systems are generally due to technical reasons like insufficient design and construction. But in projects where the standardization was performed, the problems are caused by shortcomings in maintenance which mainly rest on the villagers. The repair necessity, shown in table 17, confirms the argument.

TABLE 17 : Repair Necessity to Tapstand

	18 Previous Regular Projects		27 Standardization Projects		Total 45 Projects	
None	0	0%	3	11%	3	7%
Village Level	4	22%	17	63%	21	47%
Major repair	6	33%	6	22%	12	27%
Rehabilitation	8	44%	1	4%	9	20%

2.1.7 Recommendations Regarding Technical Issues

If a CWS project is officially handed over as completed, everybody would expect that it was really finished, but sometimes this has not been the case. The Jhapa Conference stressed on an inspection tour by the responsible project engineer, who shall also issue a certificate of completion. This is a very important step to prevent breakdowns soon after the construction is finished.

In quite a few completed projects involved RD staff have been changed very frequently during the construction phase which caused e.g. communication gaps, less responsibility, construction problems and less village contribution. At the end it leads to an unsatisfactory state after completion. Hence we recommend that the project management should not change the posted staff except for very serious reasons.

During evaluation visits sometimes it was recognized by us, that villagers have added taps, even almost private ones. In various conditions which in quite a few cases have caused the villagers unexpected effects to their water system. Maintenance supervision might prevent such effects.

Structure-specific recommendations are given regarding Standardization, Supervision and Training.

1. Spring/Stream Catchment

Standardization:
- intake and valve chamber on same bottom and top level
- improved position of the two covers (not enough place for handles or bolts)
- strainer or skreen for each outlet
- aeriation pipe
- filter box needs certain improvement and regular maintenance assistance from RD

Supervision:
- Survey team must measure the yield at least once during the driest season
- Supervision must stay during spring construction on site
- Supervisor should observe especially collection channal wall construction, fitting position.
- Source protection, afforestation

Training:
- general, comprehensive understanding
- different construction pattern, step by step
- exchange of own experiences
- improvement of Standardization
- source protection.

2. Reservoir Tank

Standardization:
- ventilation, two times double skreen, inside and mid of the wall

- inlet, only one valve
- overflow, simpler
- outlet, strainer or skreen

Supervision:
- control of masonry, cement mixture
- preventing leaks around installation pipes

Training:
- preventing leaks

3. BPT/IC

Standardization:
- no need of any IC
- two manhole covers (position!)
- alternative models ferrocement BPT, pilot model of RD Biratnagar
- float valve position, inlet 5 cm lower
- aeriation pipe

Supervision:
- position of installations
- preventing leaks

Training:
- introduction of Standardization changes

4. Valve, Valve Chamber, Manhold Covers

Standardization:
- implementation of Standardization of RD Biratnagar
- only best stop cock quality
- if two covers are next to each other, enough place for both handles or bolts
- thread along the whole bolt

Supervision:
- chamber position
- easy access for maintenance

- valve position
- bolt position

Training:
- Standardization changes
- easy access for maintenance
- preventing small main mistakes

5. Pipeline

Standardization:
- river crossing standard 6m, 12m, 24m, longer than 24m

Supervision:
- trench deep enough, properly buried
- preventing air problems
- proper joints HDP-HDP and HDP-GI
- position of high pressure pipe

Training:
- trench digging, awareness
- Standardization river crossing

6. Tapstand

Standardization:
- not anymore self closing taps
- where there are no good stones, concrete pavement
- drainage hole, double wiremesh or skreen
- only best brass tap quality

Supervision:
- careful decision on tap positions
- easy access for maintenance
- productive use of runoff water

Training:
- standardization changes
- easy access for maintenance
- productive use of run-off water

2.2 Present Maintenance Arrangements

Present maintenance arrangements for CWS projects are very poor, not appropriate, not coordinated and not supported by any structure.

In the last probably five years the on paper declared policy was according to WHO publication (2) in 1977 as follows:

"On completion, the scheme will be handed over to the village community for operation and maintenance. All maintenance work will be undertaken by the village panchayat through their technician, who will be suitably trained by LDD for the purpose. The cost of maintenance including the salary of the maintenance technician will be borne by the village panchayat.

The village panchayat will levy taxes to raise funds to cover all the maintenance expenses, including the salary of VLMW (see para. 4.3.2) and the cost of necessary pipes or fittings. However, in order to assist the village panchayat in the initial years of maintenance, LDD will provide each completed scheme with a reasonable stock of pipes and fittings in addition to a set of essential maintenance tools for use by the VLMW. Further requirements of pipes, fittings or tools will be obtained by the village panchayat directly from regional or other suitable centres, the total cost of which will be met from funds raised from water taxes". Later in that paper it is written: "At the completion of construction, the overseer will submit, through his Project Engineer, a completion report on Form No. 6 (Appendix 6) to the Director-General, LDD". A simple question only: Has it ever happened?

Under the former mentioned para. 4.3.2 we can find: "For every scheme selected for implementation, a Village Level Maintenance Worker (VLMW) will be trained to undertake the operation and maintenance of the scheme after its completion. VLMW will be from the village for which the scheme is intended and he will receive his "on the job" training from the Overseer during the construction of the scheme. VLMW will thus be given the opportunity to acquaint himself with the details of the scheme before he assumes responsibility for its maintenance VLMW will be employed by the village panchayat on a part-time basis" (2).

To execute this sort of maintenance policy on village level only one sentence is found in the present used Village Agreement Form which says: "After the completion of the project and the subsequent termination of this Agreement, the Panchayat will assume full responsibility for the upkeep, maintenance and repair of the project" (2).

The question is, we should answer first: what is the real present state of maintenance activities on village level, district level, regional level and as far as information is available on National level? The Assessment might help to set up a more feasible maintenance management.

2.2.1 Maintenance Arrangements at Village Level

Supervisors or Engineers might not be able to approach CWS project villages in order to understand comprehensively the different communities, their behaviour and their ability to arrange something like a maintenance management. Therefore, we suggest a Village Case Study for a feasible management set up of CWS projects on village level. We had already negotiations with the Centre for Economic Development and Administration (CEDA), Tribhuvan University, Kathmandu, which is maybe one of the most capable agents for such an investigation. The result is a research draft proposal shown in Annex 2. Besides them there are also onsets in the Panchayat Training Centre of Pokhara for an impact study of CWS projects. In general RD Pokhara is ready to start such a non-technical evaluation with SATA support and the RD would appreciate any additional hints on that theme. However, for this presented proposal we evaluated our questionnaires of 45 projects and assessed tentatively the present status on village level maintenance arrangements and activities.

The appointment or better the actual job performance of a VMW seems the most convenient indicator of the awareness and ability to deal with maintenance. Table 18 includes as well the results from the New ERA Evaluation (7), which gives us the opportunity of a judgement on over 50% of all completed LDD/MPLD CWS projects in the Western Development Region, and presents tentatively that about 1/3 of the project villages do not care about their water supplies at all, 1/3 have at least somehow

a voluntary arrangement and another 1/3 have established payment for their VMW either voluntary or compulsory.

TABLE 18 : Village Maintenance Worker Arrangements

	New ERA Evaluation 1977	LDM-RD Evaluation 1981		TOTAL	
		Previous Regular Projects	Standardi-zation Projects		
No VMW	8	6	10	24	32%
Voluntary VMW	9	7	11	27	37%
Paid VMW	12	5	6	23	31%
Total Projects	29	18	27	74	100%

It has to be said that the Village Panchayat does not show any interest in maintaining a water system in its jurisdiction. Only in one of 45 projects there is a VMW paid by Village Panchayat on daily wage basis.

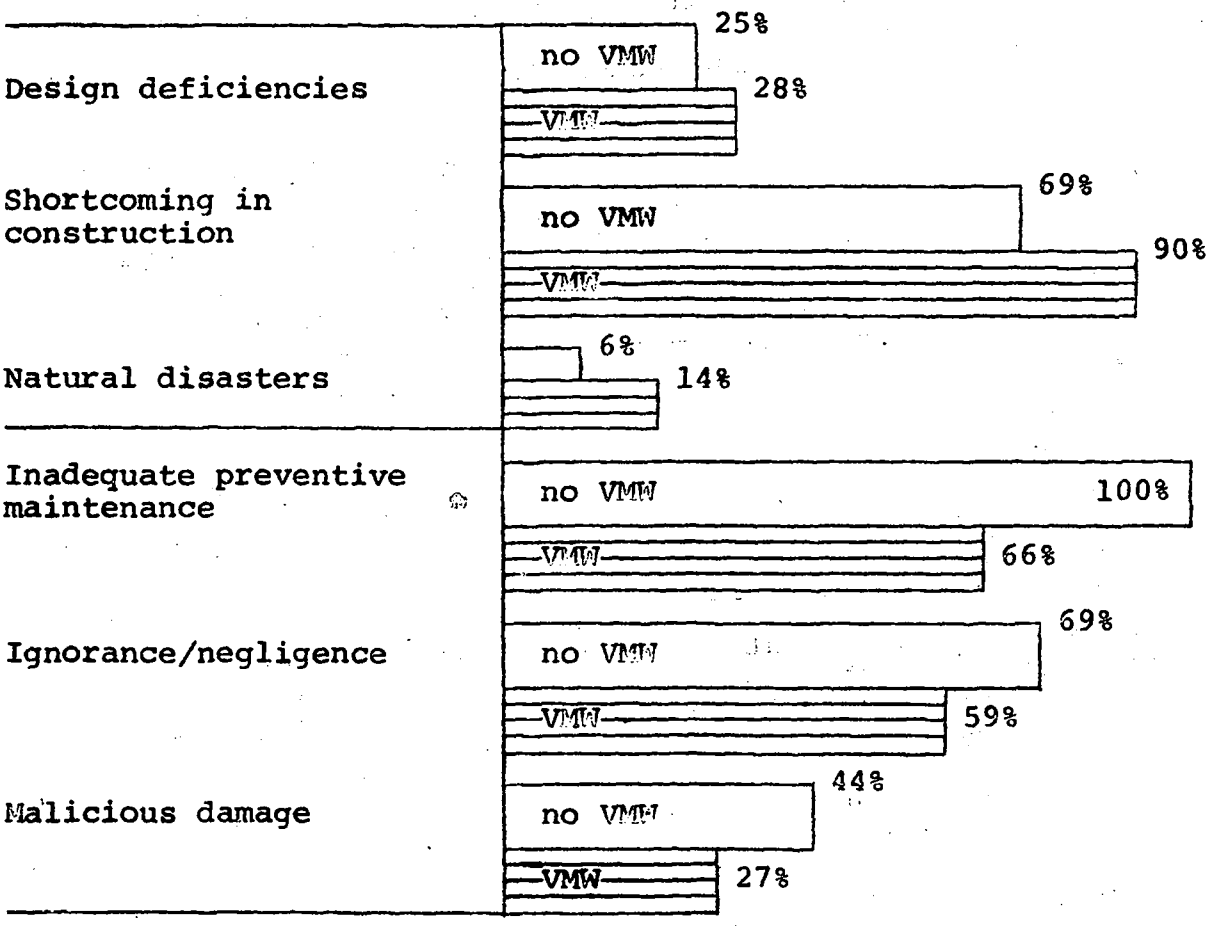
More details about the three different types of arrangements are given below.

2.2.1.1 Project Villages without any Arrangement

Even if you do not agree that this evaluation is representative of the whole Western Development Region, because there were no selection criteria for the evaluated projects, you might accept tentative results.

The MPLD-RD Evaluation has identified 16 projects out of 45 which do not perform any maintenance activities, Plot, figure 4, compares causes of maintenance and damage problems of these 16 projects with the other 29 projects where there are appointed VMW.

FIGURE 4 : Causes of Maintenance and Damage Problems in Relation to VMW Appointment



The graph shows that the physical condition of not maintained projects is slightly better than in projects where there is a VMW. But in case of inadequate preventive maintenance, improper use by ignorance and negligence and malicious damage those projects without any arrangement are worse.

What sort of villages are these without a VMW? Another important and significant figure is given in table 19 by a division among different ethnic groups and the question of any political, social or water project related quarrel in the village.

VMW are appointed in all variety of ethnic groups which is shown by the good spread in column 3. But where there is no maintenance arrangement Brahmin or Brahmin majority

project villages are absolutely prominent in relation to total by 10:16 and also quarrels stand out with 3:4. This result refers very much to a serious investigation and a strict judgement on all aspects of village contribution especially in case of Brahmin and Bazar villages. If there is little or almost no village contribution right from the beginning, you cannot expect that such a system keeps for long. A very strong recommendation has to be given for a thorough feasibility survey concerning community spirit, real need of piped water and any tension among villagers/villages.

TABLE 19 : Different Ethnic Groups, Village Quarrels and Maintenance Arrangements

Ethnic Group	No VMW Arrangement		VMW Appointed	
	Projects	Quarrels	Projects	Quarrels
	1	2	3	4
Brahmin	5	2	1	0
Brahmin/others	5	1	7	1
Magar	1	0	4	0
Magar/others	0	0	4	1
Gurung	2	0	3	0
Gurung/others	0	0	3	0
Chhetri/others	1	1	1	1
Kami	0	0	1	0
Lama	1	0	0	0
very mixed	1	0	5	0
TOTAL	16	4	29	3

The detailed survey team should also keep an eye on these aspects. There is no use in giving any input to completed projects, like tools for maintenance or repair of the system, if the villagers are not capable of taking care of it because of lack of interest, quarrels in the community, etc. Of course this needs a very sensitive

investigation but MPLD should not hesitate to drop new projects as well completed ones, if they are not feasible from the village participation point of view. The only other alternative would be, being consistent and not relying on village contribution at all and paying for everything throughout.

Project villages, where there is hardly anybody who is able to look after the project, are very much an exception. No maintenance performance is a signal of little need of piped water, no interest, problems in the community, selfishness, poor responsibility, etc.

2.2.1.2 Project Villages with Maintenance Arrangements

Maintenance activities actually are not established because of the Village Agreement. Any maintenance activity is performed by resident villagers only, if they see the effect of inadequate maintenance and breakdowns. Only in one evaluated project the Village Panchayat has employed a multi-purpose VMW. From our field visits we got the impression that village Panchayats are neither really willing to take any responsibility nor ready to arrange a maintenance management on village level. Their opinion is that LDD/MPLD shall take care of the project because Village Panchayats do not have any funds for it, the project was built by LDD/MPLD or the inability to supervise VMW's performance. Sometimes it happens that the Village Panchayat border will be changed or a project is built in parts of two or even three Panchayats. How flexible is the Village Panchayat to find any agreement?

Only people who benefit from the system are effected by breakdowns. So the water system is primarily their interest only that is why we expect at least that they feel responsible for maintenance.

Around 60% of the VMWs do not have any supervisor. Only in 6 of 27 projects the Water Committee or its chairman acts as supervisor. Almost half of the VMW are ex-soldiers. Quite a few VMWs are illiterated, which is an insufficient low qualification for the VMW Training Course. The need and demand of training is still very high. In 38 of 45 projects training is required. Many VMW have only incomplete tools. A few times we have learnt that a WSST has taken tools for maintenance and even sold them after the project was completed. Responsible Water Committee members are powerless in controlling the WSST, if they do not know what is sanctioned by RD and what is not.

Table 20 shows that there is not much difference between project villages with paid or unpaid VMW except regarding ignorance/negligence and malicious damage. Projects with unpaid VMW might have bitter community spirit and feel more common village responsibility than villages with paid VMW.

An extremely remarkable point is that there is no difference on inadequate preventive maintenance, which is in general poorly performed. Therefore, regular maintenance performance does not appear to be related to payment. Out of 11 paid VMW 8 of them are paid in "kind" mostly by one or two paathi grain per household per year. In almost all places it is quite an effort for a VMW to get his salary. If it was agreed on cash payment it is even worse.

Payment of a VMW is not the most important question of a village maintenance arrangement. This assessment is one of the most important outcomings for a future concept.

TABLE 20 : Causes of Maintenance and Damage Problems in Case of Paid and Unpaid VMW

	Unpaid VMW 18 Projects		Paid VMW 11 Projects	
Design deficiencies	4	22%	4	36%
Shortcoming in construction	16	89%	10	91%
Natural disasters	3	17%	1	9%
Inadequate preventive maintenance	12	67%	7	64%
Ignorance/negligence	9	50%	8	73%
Malicious damage	2	11%	6	55%

A village with community spirit and common responsibility will find any way an appropriate solution, if the VMW is paid or not. This leads to the recommendation for a very flexible payment guideline. However a payment guideline and some outside support might help a lot to establish a village level maintenance set-up.

According to our investigation, project villages with any maintenance arrangement, so far, are capable of tool keeping and voluntary labour support for maintenance. Where there is no maintenance arrangement, tools disappear soon and only a few villagers are willing to perform voluntary labour for repair. Very few project villages have raised occasional funds to buy small fittings, but in general there is no way to charge them for any materials.

2.2.2 Maintenance Arrangements at District Level

Not much can be reported from District level. Investigations in a few District Headquarters lead to the conclusion that at present the DTO is not able at all to handle maintenance of LDD/MPLD CWSS projects.

Individual recently posted LDOs might be aware of the maintenance problem but at present they have enough difficulties executing their running projects not to mention looking after and maintaining their own completed projects.

The lack of experience among DTO staff as well as the overall lack of manpower means they are unable to properly supervise the tremendous number of projects under construction.

It might be useful to describe briefly the expected procedure which should be followed for District CWS projects:

- VP requests to LDO
- LDO selects and decides about the priority
- DTO overseer surveys, estimates and designs the project
- LDO allocates the project budget
- LDO hands over project money according to construction progress
- VP employs local skilled labour
- VP buys materials probably together with the DTO overseer in local bazaars but e.g. for Manang (remote area) the material is directly sent from Kathmandu
- Supervision should be done by the DTO overseer
- after completion the DTO overseer should check the project and write a final report
- operation and maintenance responsibility is given to VP.

In general you cannot anticipate a store room for project material or other facilities at District Level at the moment. We faced another problem too. What is the actual responsibility of LDO regarding CWSS projects executed by RD, according to the new MPLD structure? What should be the relation and cooperation between RD and LDO?

2.2.3 Maintenance Arrangements at Regional Level

Awareness of the maintenance issue is still very low among the LDM-RD staff because it is a problem only very recently recognised. There were many verbal agreements not put into action at Regional level. First practical steps towards a maintenance set up faced many problems due to lack of motivation.

2.2.3.1 Present Organisation and Management

After the task for a long-term maintenance proposal was given to the authors, Mr. Swatantra Raj Tuladhar, Ass. Eng. was posted for Immediate Maintenance in the Western Development Region. Project Manager Mr. Martin Strauss explained in detail the responsibility and duty of that new post, for example utilization of the present maintenance budget, start of already selected rehabilitation projects, etc. Due to lack of motivation nothing much happened. Hence the job was given to Mrs. Tara Laxmi Sankha, Ass. Eng. But again, even though she got a clearly written job description, after about one month it was clear that Immediate Maintenance was not making any progress. Some weeks later Mr. Krishna Kanta Sigdel, Ass. Eng., who recently joined RD Pokhara was appointed on that post. He fortunately is ready to work seriously on the maintenance task. For the time being only one Supervisor has worked occasionally for maintenance rehabilitation projects and two WSST have been sent for rehabilitation and major repair projects. Due to these circumstances not much was done during the fiscal year 1980/81. RD Pokhara achieved only:

- Sanitation major repair project, Dhatum High School, Syangja District
- CWS repair, Harpak, Kaski District
- CWS repair, NDS project, Udhendhunga, V. P. Khairenitar, Tanahun District
- to start rehabilitation project, Arwa W.1-6, V. P. Arwa Bijay, Kaski District

- to start rehabilitation project, Chhapalthar, V. P. Lahachok, Kaski District
- CWS repair, Timpiple, V. P. Rakhi and Sundaridanda, V. P. Begnas, Kaski District, during VMW Training Course.

For the Fiscal Year 1980/81, 150,000 Rs. have been allocated for repair and rehabilitation of CWSS projects but only appr. 5,000 Rs. for Dhatum High School were officially utilized.

In terms of material support for maintenance projects UNICEF's position is still unclear at RD Pokhara. Only a few small fittings were taken out of the project store for minor repair activities. At the end of this year's VMW Training Course most of the trainees were equipped by basic tools for their maintenance performance.

At present the Storekeeper has maintenance 'magh' form files per district for major and village level repair and usual 'magh' form files for rehabilitation projects.

The administration has no proper filing and information system e.g. maintenance requests are found in different files and the Maintenance Engineer is usually not informed about requests. Maintenance requests to RD Pokhara are shown in Annex 12.

2.2.3.2 Village Maintenance Worker Training Course

About three years ago LDD Pokhara had organized the first VMW Training course with 36 participants at Panchayat Development Training Centre (PDTC). Two years ago no training course had been organized. Last year's training was held with 8 participants only. Besides the difficult situation before the National Referendum there were also some cooperation problems LDD-PDTC and it happened that 20 villagers for that training were sent back and asked to come again one month later. This year 15 villagers participated in the VMW Training Course. More than half of them came from completed projects recently evaluated by us. 5 people came either from just finished projects, projects in final stage or already started rehabilitation projects. One person arrived from the Thina Khola Integrated Project area and one from an even not officially invited "Phutkar" project. Nobody arrived only because of the official invitation letter. Obviously the

present official invitation procedure is not able to encourage villagers to participate in the course. A list of all 59 VMW Trainees is found in Annex 4.

Upto now there is no smooth organizational set-up regarding all training courses at RD level, which is also caused by little cooperation on National level. A variety of problems has hampered the course implementation from the very beginning.

1. Budgeting was not done either jointly with PDTC nor in time. The whole application procedure is very unclear. From time to time additional uncoordinated budget application instructions from LDD/MPLD have confused RD Pokhara even more. Because of some obscurities in LDM their was no budget applied for to the Finance Ministry for any training course of RD Pokhara for the Fiscal Year 1981/82. Fortunately, so far three VMW Training Courses have been held but a proper budget procedure is urgently needed anyway.

2. Course date during monsoon, the most busy period for villagers, is the worst imaginable time for such a course which is purely conducted for villagers. The best period for them is Maagh and Phagun.

3. An institutional aspect is the invitation of trainees in time. It should be done at least two months before the course starts by a direct letter to the Water Supply and Sanitation Committee Chairman of any selected project. However, RD has to inform LDO, this can be done by a separate letter to him. In the past invitations were sent too late and some Districts have not passed on the information to the particular project village.

4. Course performance. The main objective of a VMW Training Course is to train literate and motivate villagers on village level preventive and repair maintenance. They should be enabled to perform regular operation control by a standard check list, as well as executing small repair, if necessary with additional materials, supported by RD.

The last course consisted of three weeks theoretical and practical classes and one week major repair of two projects in Kaski District. On the last days of the third week also the importance of sanitation was taught

and a latrine was built. Lekh B. Gurung developed the present VMW course curriculum (13) which is available in English and partly in Nepali. To some extent it should be continuously improved. Quite a few trainees are illiterate but eager to perform the job, this has to be taken in consideration.

Annex 5 presents the VMW course schedule and names of all responsible instructors.

So far 1981 the cooperation with PDTC and its new Principal Mr. R. K. Shrestha has been excellent which is a good basis for further improvement.

The last source week has been spent at project site. Project village Timpiple has not contributed any voluntary labour at all, also in Sundaridanda the trainees were hardly supported by villagers. Due to the disadvantageous monsoon season poor contribution is quite reasonable but the villagers have not shown any interest in the repair work. It was known already before that also during construction these villages had been little cooperative, but because of the advanced situation near roadhead Pokhara the trainees could stay in PDTC. Informal talks with the trainees gave the impression that mainly poor villagers turned up with the intention to get one month food and lodging free and become later a government employee.

2.2.3.3 Additional Activities

Already 1979 a so-called Maintenance Booklet was prepared by Evert Showerwow (14) for the Western Development Region. He developed a regular checking system for village level on a rather simple basis but still we found that it is too sophisticated for the actual very low education standard of VMW. Lekh B. Gurung developed in a second attempt a probably easily understandable checklist for VMW in Nepali script, which was introduced first during the last VMW Course (13).

Because the present state of completed CWSS projects is very much based on programme performance like procedures, standardization, training etc. Walter Schramm has tried to create a better atmosphere of cooperation on region level by a first official visit to RD Biratnagar (15). At that time not much was thought about maintenance there, but e.g. some standard designs implemented in the

Eastern Development Region are able to improve weak or expensive construction of the Pokhara Standardization for better and easier operation as well as maintenance.

The authors have been participating as instructors of the WSST Refresher Course recently held for the first time, especially on communication and construction/ maintenance issues. It seems necessary to extend the lessons on design and construction details to avoid common construction mistakes in future which will create an improved maintenance status later on.

2.2.4 Maintenance Arrangements at National Level

In 1977 New ERA prepared its Community Water Supply Programme Status Report (7) which were submitted to LDD Headquarters Kathmandu and UNICEF/Nepal. The main impact of that critical but constructive report was that it created at least a basis for discussions and may be later some awareness too. But even so no National level concept or policy framework has been developed so far. Regional Offices partly started with some small activities recommended by New ERA, e.g. RD Pokhara establishing the VMW Training Course three years ago.

National planning on LDM's CWSS Programme is very much target-oriented and does not focus much on the real present state. It might be more difficult to evaluate the present state on National Level than in a single Development Region. After we have combined various sources, according to our estimate LDD/MPLD has completed appr. 250 CWSS projects all over Nepal in its 10 years history.

An encouraging sign is the budget allocation for project maintenance and rehabilitation projects. In the past finances have been used in general only for rehabilitation activities but hardly for smaller scale repair. This became the most unclear point regarding budget utilization in the Fiscal Year 1980/81. The whole budgeting procedure is still very unclear on RD level and seems also not coordinated. How to design the budget application, when to submit it, and how does the decisions take place, are the open main questions. This general problem very much hampers of course the whole Programme, and also future maintenance planning.

LDM Kathmandu has sent an official letter regarding maintenance policy (ref. 2037/11/27) to RD Pokhara, for an unofficial translation see Annex 6. Main point no. 1 says: "If projects to be maintained cost Rs. 5,000 they should be only maintained with village contribution in terms of money and labour. But the fittings which are needed but not available in the market could be provided by the Regional Directorate".

Out of our evaluation experience it is impossible to expect from villagers any cash contribution for buying pipes, cement or fittings in the market even if they might be fortunately available. Regional Director G. L. Shrestha agreed as well on that opinion on an engineer meeting held on 24 March 1981. For project maintenance unpaid skilled labour and transport contribution seems possible to some extent. No doubt village contribution has to play an important role especially in the post-construction phase, therefore, it should become a strict rule that only cooperative project villages, which are ready to commit themselves to the proposed maintenance set up at village level, can get repair inputs.

2.3 Summary of the Assessment

2.3.1 Present Technical Status

The physical condition of Water Supply Systems, built by LDD/LDM-RD Pokhara in the Western Development Region, is not satisfactory, especially if you focus on operation maintenance. Out of 45 CWS projects only say appr. 10% of all investigated structures do not need any repair.

Table 21 presents a quite clear picture of the fruitful impact of the Noted Project Programme with its Standardization, which has been implemented from 1977/78. About 80% of the assessed structures of previous regular projects require major or rehabilitation repair compared to only rd. 35% of standardized ones.

TABLE 21 : General Assessment of Repair Necessity of All Structures including Pipelines

Repair Necessity	18 Previous Regular Projects	27 Standardization Projects	Total 45 Projects
None	1%	12%	8%
Village level	17%	53%	38%
Major	42%	32%	36%
Rehabilitation	40%	3%	18%

The general assessment of repair necessity of all structures leads to the conclusion that a well designed and executed standardization is a main tool for minimizing repair workload as well as maintenance expenditure.

A second attempt to compile the current operating status is shown in table 22 below. This table was developed in consideration of all available records of the evaluated projects. The quality of each project is assessed according to the following defined categories:

Near optimal: well constructed project supplying ample quantity of water and supported by functioning maintenance arrangement.

Minor flaws: project which functions in essential respect but which nevertheless requires improvement like little spring catchment repair, better tapstand sanitation, modified maintenance arrangements, etc.

Major flaws: project which has serious flaws including inadequate flow, major incomplete components or important repair needs.

Non-functional: project which has listed as complete but have not in fact functioned or which has heavily broken down and does not supply water to almost all taps.

TABLE 22 : Success Rating of 45 Evaluated CWS Projects in the Western Development Region

Category	18 Previous Regular Projects	27 Standardisation Projects	Total 45 Projects
Near optimal	0%	15%	9%
Minor flaws	33%	44%	40%
Major flaws	33%	37%	36%
Non-functional	33%	4%	16%

A project, consisting of structures with different status, is expected to be slightly different on general assessment of success rating, but the presented project success rating of table 22 shows in the total column almost exactly the same result as given by repair necessity of all structures at table 21.

Besides the standardization more experienced and better trained technical manpower has to get some credit too. But you can see at table 23 'technical causes of maintenance problems', that shortcomings in construction still occur in extremely high percentage.

TABLE 23 : Technical Causes of Maintenance Problems

	18 Previous Regular Projects	27 Standardization Projects	Total 45 Projects
design deficiencies	44%	15%	27%
shortcoming in construction	89%	70%	78%
natural disasters	11%	11%	11%

That means, our experienced technical staff still need training. Hence refresher courses, seminars, in-service training or workshops are seriously justified at all levels. Especially work on spring/stream catchment, valve chambers, manhole covers, rivercrossings as well as tapstands should be concentrated upon.

In essence the authors have determined that the technical status still shows a similar result as New ERA presented 4 years ago: 50% of the projects have major flaws or are non-functioning.

According to Ten Year Plan (11) during the 5th Five Year Plan period (1975-1980) the total LDD/LDM development budget for Water Supply was only 46.845 Mio. Rs. If a success rating of 50% is assumed all over Nepal, you must agree that appr. 23 Mio. Rs. have not been properly utilized.

2.3.2 Present Maintenance Management

At present maintenance arrangements for CWSS projects are very poor, not appropriate, not coordinated and not supported by any structure. Activities partly performed are little effective because they are not combined in a wider concept, which is urgently needed. Obviously the pointed out maintenance policy, see chapter 2.2, could not meet its aim due to poor approach and implementation on all levels. If you keep in mind the tremendous loss of inputs (50%) and probably high disencouragement effects in any other HMG development activities in these particular areas a maintenance management set up has to be established very soon.

3. CONCEPT FOR A FEASIBLE MAINTENANCE AND REPAIR MANAGEMENT

HMG's Ten Year Plan for the Provision of Drinking Water Supply and Sanitation (11) comes to the conclusion: "more attention needs to be devoted to operation and maintenance by LDM which has responded to this by budgeting for materials and a number of roving maintenance crews to provide augmentation and rehabilitation services for older and "run-down" systems. Further it is assessed that the Panchayat has not been able to raise adequate revenue to meet the operation and maintenance cost which includes the salary payment to the VMW. Inability on the part of the Panchayat to retain the service of trained VMW is a matter of serious concern" (11).

After the Assessment of Present State which shows a rather poor maintenance status and almost no maintenance and repair set up, we are going to propose a concept for future organization in order to render systems better and keep them more easily maintainable. The presented proposal for a feasible maintenance and repair management tries to fit in the new MPLD structure and wants to be implemented very soon as integrated part of the CWSS Programme.

Referring to chapter 1.1 where the different CWS activities in rural areas have been mentioned, the authors recommend a better communication and cooperation not only between the Regional Directorates but also including MPLD Kathmandu, LDOs, integrated projects and DWSS. This maintenance management concept is written based on the Western Development Region and takes care of CWSS projects built by LDD/MPLD-RD Pokhara only.

An encouraging first step of cooperation was the Jhapa conference which should be followed up by a serious policy conference on the CWSS maintenance issue too. The outcome should be officially approved by the Minister of Panchayat and Local Development.

3.1 Definition of Different Terms

A maintenance management has to cover regular maintenance and repair maintenance.

Regular maintenance is understood as preventive, routine work which has to be systematically performed. This task is essential for good operation.

Repair maintenance obviously deals with any damage repair of either single structural elements, for example leaks or serious breakdowns like destroyed spring catchments, or rehabilitation of almost a whole project.

For technical classification of repair we divided the workload in village level repair, major repair and rehabilitation repair which seems appropriate to the occurring problems.

Village level repair is defined as small, minor repair executable by a VMW. If materials or fittings are needed, they should be handed out to VMW or Water Committee Chairman by RD upto estimated 500 Rs. without sending a WSST there.

Major repair has to be executed by assistance of a WSST, if the estimated cost of required materials are more than 500 Rs. but also less than 8,000 Rs. including WSST's salary and UNICEF contribution. Skilled labour, semi-skilled labour and transport should not be paid. Only all materials and technical assistance should be given from RD to major repair projects.

Rehabilitation repair includes all major repair which is estimated on more than 8,000 Rs. These cases shall be treated in the same way as new projects that means full technical assistance has to be given as well as skilled labour, semi-skilled labour and transport have to be paid via District headquarters to the rehabilitation project.

The reason why RD should provide all materials for repair is because the villagers are unable either to pay for repair materials nor to get them in sufficient size and quality in local bazaars. This classification is also necessary in order to control proper use of materials but also to keep inputs at a certain level.

Plan phases are required for a step by step approach and to meet finally HMG policy towards decentralization.

Plan Phase I is called the initial approach implementing the maintenance concept. For RD Pokhara that Phase should go in action after introduction during the RD-staff Seminar in autumn 1981. In this plan phase all remaining CWSS projects should be evaluated and the

maintenance concept must be introduced on all levels first. Besides that per year 9 rehabilitation projects and 18 major repair projects should be executed by support of the new established Maintenance Section.

Plan Phase II intends to show a smooth running management set up executed under main responsibilities on village level and still RD level.

Plan Phase III expects handing over of RD responsibilities to District level according to the intention of decentralization. Village level responsibility should still remain like in Phase I/II and RD should play the role of a coordination centre guiding district maintenance activities to reasonable self-sufficiency.

3.2 Responsibilities and Main Procedures on Different Levels at Certain Phases

Maybe the most difficult task is distribution of responsibility which has finally to cover the whole maintenance workload among different levels including communication and cooperation links. The final decision might interfere with political interests, but at least the authors have tried to work out a very practical oriented proposal which purely emphasizes the benefit of the CWSS Programme to rural people of Nepal.

It is generally assumed that HMG is not ready to pay VMW salary but technical assistance and all required materials will be given by HMG and UNICEF.

A proper implementation will take time. Already in the Pokhara region alone there are some 130 completed projects which will be a very heavy workload for maintenance. Besides the well known pre-construction, construction and post-construction phases, we have added Plan Phases I, II and III.

3.2.1 Responsibility at Village Level

It was mentioned several times before that Village Panchayat is not a capable partner to implement, operate or maintain a CWSS system. Hence MPLD-RD has to depend on the over all village responsibility of the Water Supply and Sanitation Committee from the actual project area which must be taken as the official representative

of the project villagers. The Committee has to be well maintained during pre-construction phase, construction phase and of course also during post-construction phase.

The following responsibility design includes some alternations to the Jhapa conference outcome compiled altogether in Annex 7.

Pre-Construction Phase

1. People of the project area have to prepare themselves for the project according to the official project introduction letter which should be presented and discussed by the detail survey team.

2. Water Committee Chairman must sign the altered Village Project Agreement form shown in Annex 8.

Construction Phase

3. Responsibility as it is described by Jhapa Conference outcomes (3).

4. Water Committee together with MPLD-RD technical staff has to appoint at least one resident VMW as WSST Assistant right from the beginning.

5. Water Committee as representative of the benefitting Community and Village Maintenance Worker must come to terms on a reasonable and appropriate rate of payment in kind or cash and must sign the Village Maintenance Agreement as proposed in Annex 9.

Post-Construction Plan Phase I

6. Completed projects must re-install the Water Committee and select at least one resident VMW and proceed with the Village Maintenance Agreement as described in item 5.

7. The Committee supervises the general job performance of VMW and raises funds for his salary.

8. Project operation, routine maintenance and minor repair work is performed by VMW according to maintenance checklist, Annex 10, and instructions of Maintenance Supervisor and Maintenance WSST.

9. Project villagers provide voluntary labour for repair maintenance.

10. A tapstand caretaker is responsible for the states of his tapstand.

11. VMW keeps and is responsible for maintenance tools and spare parts, while the record of tools and materials is kept by the Village Panchayat Secretary.

12. Water Committee tries to prevent and cure vandalism.

13. Water Committee Members/tap caretakers should prevent improper water use.

14. Any breakdown which cannot be handled by VMW should directly be reported to CWSS Maintenance Section via Regional Director and Project Manager/Divisional Eng.

Post-Construction Plan Phase II

in addition to all responsibilities of Plan Phase I (7 - 14)

15. The Village Development Programme should include integrated aspects of CWSS programme like afforestation in the catchment area for source protection and preservation.

16. Project villages should pay for brass tap replacement.

Post-Construction Plan Phase III

in addition to all responsibilities of Plan Phase II (7 - 16, except 14)

17. A project village should give some financial support for major repair.

18. The VMW should be then a multi-purpose technician, not only responsible for CWSS, paid by the Village Panchayat.

19. (Replacing item 14) Any breakdown which cannot be handled by VMW should be reported then to the DTO.

3.2.2 Responsibility at District Level

At present decentralization is still in a very initial phase and besides that not very much is known about HMG's approach. Referring to assessment of maintenance arrangements on district level, not much should be expected from district side on maintenance except some administrative supervision during Plan Phase I and II. The proposed responsibility is modified as follows:

Plan Phase I

1. LDO should immediately pass on repair requests and any other reports regarding completed MPLD-RD CWSS projects to the Maintenance Section for further action via Regional Director and Project Manager/ Divisional Eng.

2. Handling of project money for rehabilitation projects should be done as usual.

3. LDO should watch over the performance of Village Agreement and Village Maintenance Agreement.

4. LDO should take action if contract obligations are not fulfilled (e.g. no other HMG development activities in the project area) and he should report to RD.

5. LDO and other district authorities should help to prevent and to cure vandalism.

Plan Phase II

In addition to all responsibilities of Plan Phase I (1 - 5)

6. The integrated aspect of CWSS projects should be included in the District Development Plan e.g. source protection by afforestation and education in proper use of water.

Plan Phase III

In addition to all responsibilities of Plan Phase II (1 - 6), careful handing over of MPLD-RD responsibilities to district authorities should take place.

7. DTO should set up a District Maintenance Supervision System under a District Overseer and Technical Assistants of the District Services Centres.

8. The District Maintenance Overseer should sign the Project Completion Certificate, Annex 11.

9. Major repair should be executed under technical assistance of DTO staff who has been trained by RD at Plan Phase II.

10. If required, DTO should train multi-purpose technicians for any task on Village Panchayat level, of course also for CWSS project maintenance.

11. At least twice a year the District Maintenance Overseer should inspect all completed CWSS projects and he should keep an assessment status report.

12. Each DTO should be in closed contact with RD Maintenance Section giving feed back to improve further the CWSS Programme and to develop appropriate procedures.

3.2.3 Responsibility at Regional Level

Some maintenance activities have been started, but so far they have not been a part of a whole concept. Plan Phase I seems to have the heaviest workload for Regional Directorates because the Regional Directorate is the starting point for any maintenance activity. Regional Directorate is the only capable level to start with, hence on that level the prior condition has to be created for any maintenance activity. The task is detailed below in the different phases.

Pre-Construction Phase

1. During detail survey an official letter of introduction in which the coming maintenance task is also mentioned should be presented to village leaders that the project village has time to prepare themselves for the construction phase.

2. After the Water Supply and Sanitation Committee is established under RD supervision the altered Village Project Agreement, Annex 8, has to be signed.

Construction Phase

3. The responsibilities are clearly described by the Jhapa Conference Report (3) and in some altered output proposals, Annex 7.

4. Right in the beginning RD staff shall participate in the selection of at least one VMW as WSST Assistant, who should be paid as semi-skilled or skilled labour according to his performance.

5. The Project Supervisor shall introduce the Village Maintenance Agreement, Annex 9, and help the villagers to come to terms with it and understand their obligations.

6. After the Village Agreement has been signed and a pre-final check done by the Project Supervisor, the Project Engineer together with the particular Maintenance Supervisor and the Project WSST shall check the whole water system with the evaluation form Annex 3. Only if Project Engineer, Maintenance Supervisor and Water Committee Chairman together attest the Project Completion Certificate, Annex 11, is the project officially handed over to the Water Supply and Sanitation Committee which is supported further by the Maintenance Section of RD by technical supervision and assistance. At the same time the Maintenance Supervisor shall hand over the maintenance tool box with some spare parts and the Maintenance Checklist forms, Annex 10, to VMW.

Post-Construction Plan Phase I

7. The Maintenance Section implements the maintenance concept on RD level under over all responsibility of Regional Director and Project Manager/Divisional Engineer.

8. A very thorough feasibility survey done by the Maintenance Supervisor should investigate and assess the village enthusiasm. In case of already completed old projects the Maintenance Supervisor has to introduce the maintenance concept, assist in re-installing the Water Committee (3 to 5 people may be sufficient) and selection of at least one resident VMW. Only after the Village Maintenance

Agreement has been signed between Committee and VMW is the project deemed feasible for any repair input by RD.

9. Final responsibility for feasibility and priority of rehabilitation project is taken by Regional Director and Project Manager/Divisional Engineer. In case of major repair only the Maintenance Section should decide itself feasibility and priority.

10. Major repair and rehabilitation projects are executed with materials support, assistance of WSST and supervision by a Maintenance Supervisor. In addition for rehabilitation projects only skilled/semi-skilled labour and transport is paid.

11. The Maintenance Section shall prepare its budget application and material requirement in time and jointly with Project Manager/Divisional Engineer. If necessary, additional manpower should be requested to Regional Director.

12. Maintenance Supervisors shall evaluate all remaining completed projects by the evaluation questionnaire, Annex 3, and by the time they shall proceed the Village Maintenance Agreement. Hence the Maintenance Section should carry on with the assessment status report.

13. If the Village Maintenance Agreement has been signed but maintenance tools and spare parts are required, RD should supply them to the project village.

14. RD must perform further VMW Training Courses. At least one VMW of each already completed project should be trained. For future projects under construction a VMW should get additional training, if either WSST/Supervisor or VMW request for it.

15. Maintenance Engineer and Maintenance Supervisors shall teach as instructors of the VMW Training Course. They should improve the present course curriculum and evaluate all trained VMW later.

16. At least every year the Maintenance Supervisor shall inspect all completed CWSS projects in his area, stay at least two days there and record findings.

17. The Maintenance Section should suggest standardization improvements and more efficient management procedures out of their experience.

18. The Maintenance Section must establish a proper filing system of all completed projects with original projects file, status report, repair estimate, etc. on project and district basis.

Post-Construction Plan Phase II

In addition to all responsibilities of Plan Phase I (7 - 18):

19. If required for Plan Phase III, technical staff of DTO should be trained for maintenance supervision and project repair.

Post-Construction Plan Phase III

RD should carefully hand over its responsibilities to DTO. Rehabilitation projects shall still be executed by RD which shall also still be responsible for all maintenance aspects during pre-construction and construction phase. Close cooperation with DTO is essential in this Phase.

3.2.4 Responsibility at National Level

Hopefully this proposed concept can be a basis for the coming maintenance policy by the Ministry of Panchayat and Local Development. The most important requirement on national level is coordination. But a clear policy framework of rules and regulations must leave enough lee-way for Regional Directorates to decide at their own discretion an adequate implementation of the maintenance concept in their own regions. The present condition of the Development Regions now five in all, differs very much. Appropriate planning is only effective if present state of programme implementation, infrastructure, capability and other tendencies are taken in consideration.

Especially for the heavy work load during Plan Phase I/II the manpower requirement of 24 Overseers for maintenance throughout the country shown in CMSS Ten Year Plan (11) should be fulfilled. Only most experienced and eager Project Supervisors should be appointed as

maintenance supervisors. The occupation as maintenance staff will be very frustrating because this job touches MPLD on its most tender spot. The general consciousness of maintenance is still low therefore, the authors suspect that staff employed on maintenance must be given monetary incentives.

MPLD should allocate sufficient funds for project repair maintenance in its development budget and negotiate with UNICEF division of contribution. For Plan Phase III it is proposed that MPLD should fully take over UNICEF contribution in case of project maintenance and proceed material requirements for maintenance by reimbursable procurement.

3.2.5 Responsibility Charts

For a summary much responsibilities are shown in their relation to different levels in the following two charts.

FIGURE 5 : Responsibility Chart, Plan Phase I/II

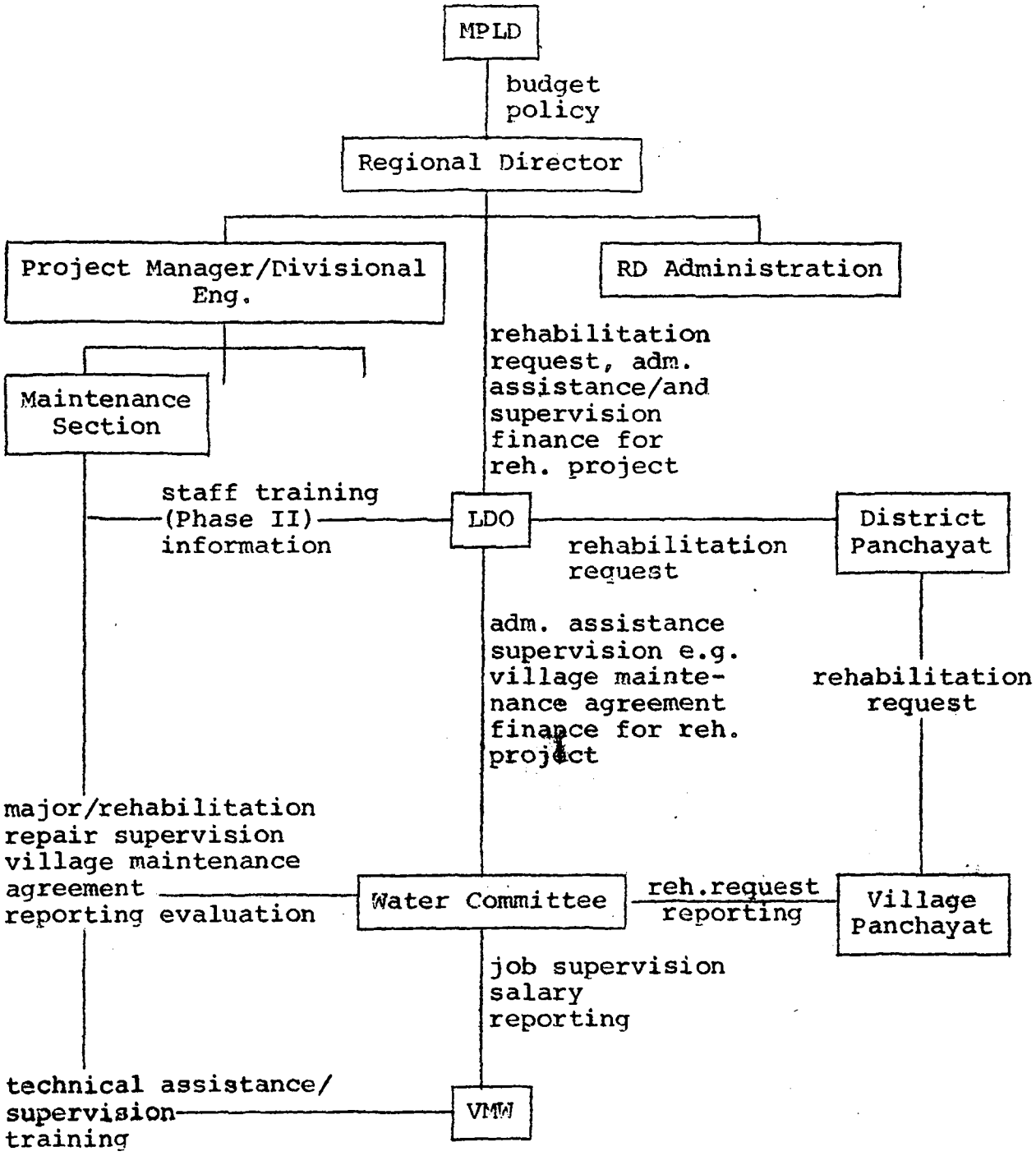
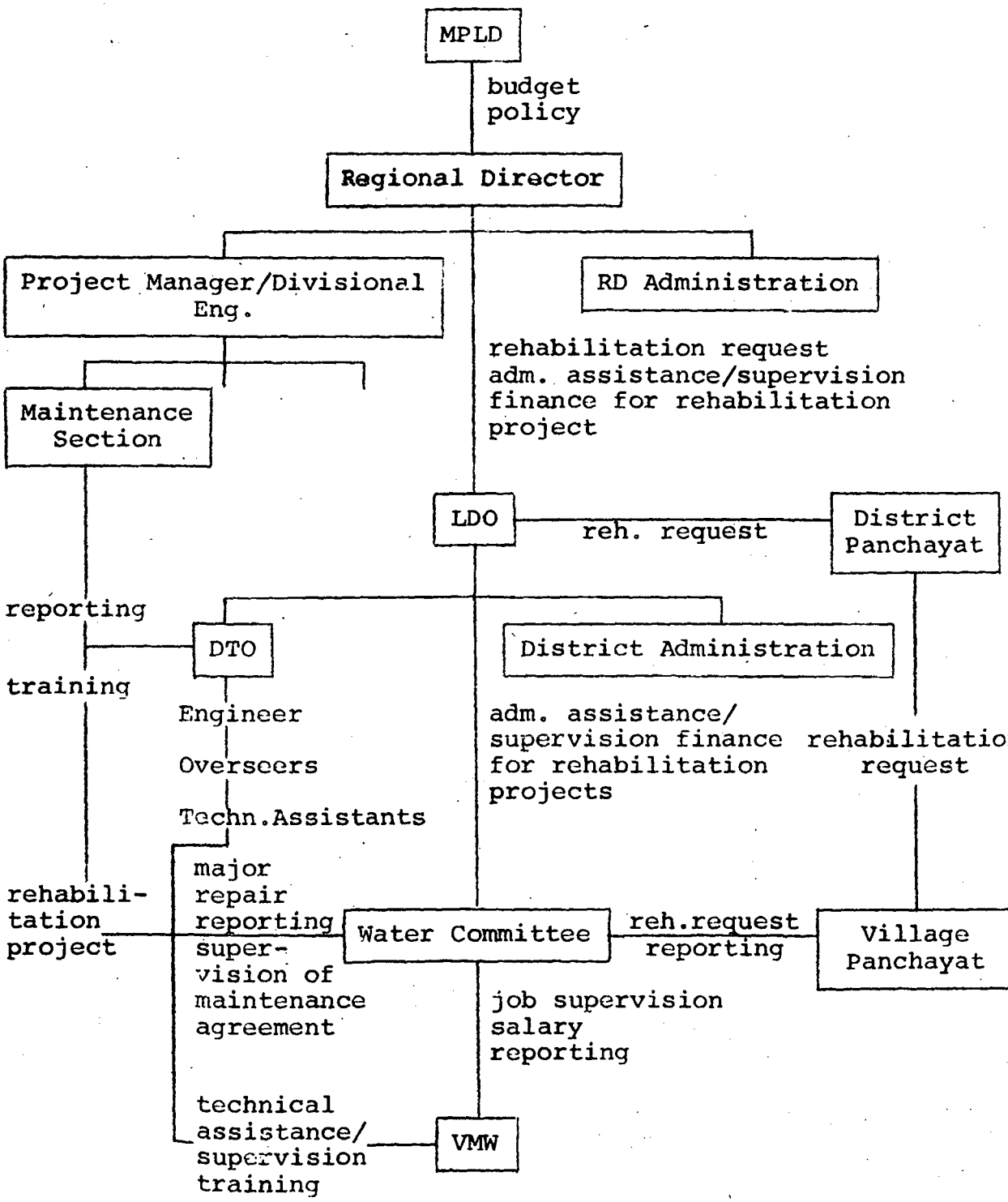


FIGURE 6 : Responsibility Chart, Plan Phase III



3.3 Manpower Requirements for the Maintenance Section

Manpower requirement is modified during the different plan phases according to the expected workload. Plan Phase I is the most important and busiest period. In Plan Phase II no special Maintenance Engineer is proposed because each Project Engineer should be responsible also for all completed projects in his particular area assisted by one experienced Maintenance Supervisor, who covers exactly the same area and keeps close relation to his Engineer. All Maintenance Supervisors and all Project Engineers are jointly responsible then for over all maintenance activities like training or improvement of standardization and procedures.

Plan Phase III only keeps staff for supervision and execution of rehabilitation projects, technical advice and coordination of the District Maintenance Programme.

For the Maintenance Section only most experienced technical staff is suitable because they have to be very familiar with all sort of construction work before they are able to repair inadequate structures, compensating construction mistakes, etc.

One big room with 4 desks, 8 chairs, 2 big file shelves and one bookshelf are essential for the Maintenance Section. The new Section should be recognized as an important part of the CWSS Programme at RD. Having designated room should create a healthy team spirit and keep communication problems small.

Proposals for Western Development Region

Plan Phase I

One Maintenance Engineer:	should be in charge for the Maintenance Section on Development Region level according to his job description and RD responsibility.
Three Maintenance Supervisors:	should be most experienced Project Supervisors. Their working area should be distributed as follows:

1. Dhaulagiri Zone, all districts

2. Gandaki Zone, all districts except Kaski district

3. Lumbini Zone, all districts and Kaski district

They should work according to their job description.

Four Maintenance WSST. should be most experienced technicians for rehabilitation projects under that Maintenance Supervisor in whose area the project is situated.

Three Maintenance WSST: should be experienced technicians for major repair. Each should be posted direct with one Maintenance Supervisor.

Plan Phase II

Four Project Engineers: should be jointly responsible for over all activities of the Maintenance Section and especially responsible for all maintenance activities in each of their particular areas.

Four Maintenance Supervisors: as team from the Maintenance Section. Each Maintenance Supervisor is responsible according to his job description for his area and to his Engineer.

Three Maintenance WSST: should work for rehabilitation projects only.

Four Maintenance WSST: Each should be posted direct with one Maintenance Supervisor major repair.

Plan Phase III

One Maintenance Engineer: should act as technical advisor and coordinator for the District Maintenance Programme and should supervise rehabilitation projects.

Two Maintenance Supervisors:	should assist the Maintenance Engineer e.g. in supporting District Training Courses and should supervise rehabilitation projects.
Two Maintenance WSST:	should work for rehabilitation projects only.

3.4 Job Description for Maintenance Staff

Job descriptions are written down for Plan Phase I only, because first of all job descriptions are still unusual for MPLD and a job description has to very much fit in the present state of programme implementation. For Plan Phase II it is thought that each project Engineer shall be responsible for maintenance in his particular area like the Maintenance Engineer in Plan Phase I for the whole Development Region.

3.4.1 Maintenance Engineer

Engineer in Charge of Maintenance Section

Job Description for Mr. .....

.....

(signature)

As Engineer in charge of the Maintenance Section he is engaged with implementation of the whole maintenance concept. He will be assigned to supervise water supply and sanitation major rehabilitation projects as well as major repairs of old LDD/MPLD projects in the whole Western Development Region. For managing this task the Maintenance Engineer shall work according to the agreed office procedure for maintenance and rehabilitation projects. The following outline describes the particular duties and responsibilities of the Engineer for Immediate Maintenance.

1. <u>Project Preparation</u>

1.1 He is responsible for utilization of the CWSS project maintenance budget and submitting of maintenance budget application in time.

1.2 He, together with the Director and the Project Manager/Divisional Engineer will decide about

feasibility, rehabilitation/major repair and priority after a preliminary survey/project maintenance evaluation was done.

1.3 He has to participate in the detail survey of rehabilitation projects together with the particular Maintenance Supervisor, who will supervise the project later on. A survey report has to be submitted to the Project Manager/Divisional Eng. and the Director.

1.4 He is responsible for survey, design and estimate.

1.5 He shall supervise re-installing of a Water Supply and Sanitation Committee and that the Village Maintenance Agreement has been signed before any maintenance input is given from RD.

1.6 He shall assign Maintenance WSST to his supervisor and project.

2. Supervision

2.1 He is responsible for project execution.

2.2 He shall always be available to help the Maintenance Supervisor overcome technical or community problems.

2.3 Site visits are required at least once during project construction of rehabilitation schemes.

3. Project Monitoring, Reporting and Filing

shall be done according to the usual practice in RD and according to the procedures for maintenance and rehabilitation projects. A separate filing system for maintenance and rehabilitation projects shall be established by him.

4. Project Completion

4.1 In case of major repair the Supervisor has to submit a final report after inspection of the whole system for which maintenance and repair has been performed. The report shall be handed over by the Maintenance Engineer to the Project Manager/Divisional Engineer and the Director.

4.2 In case of rehabilitation projects he, in company with the maintenance Supervisor, WSST and the Water

Supply and Sanitation Committee Chairman, has to do an inspection tour of the whole system.

4.3 He should inspect the project store and the financial records.

4.4 He shall ensure that in both cases, major repair and rehabilitation, the Committee has established a practical maintenance programme with at least one Village Maintenance Worker.

4.5 He shall ensure that in both cases the Village Maintenance Worker has proper training, tools and materials with which to perform his job.

4.6 He shall prepare a final project completion report and submit it to the Project Manager/Divisional Engineer and the Director.

4.7 He shall issue a certificate of completion in case of rehabilitation projects to the Committee.

5. Other Maintenance Activities

5.1 He shall compile all project evaluations and assessment done by Maintenance Supervisors and shall develop a current status record of the CWSS Programme at post-construction phase.

5.2 He shall be involved in VMW Training and WSST Refresher Training Courses by improving the current curriculum and teaching.

5.3 He, together with Maintenance Supervisors, shall propose improvements of standardization and more efficient procedures.

.....	.....
place, date	place, date
.....	.....
(CWSS Project Manager/ Divisional Eng.)	(Regional Director)

3.4.2 Maintenance Supervisor

Supervisor for Maintenance Projects

Job Description for Mr. .....

.....
(signature)

The Maintenance Supervisor will be assigned to supervise maintenance projects and to perform other tasks regarding CWSS Maintenance Programme. The following outline describes the duties and responsibilities of the Maintenance Supervisor.

1. Assignment

1.1 The Maintenance Supervisor shall work under supervision of the Maintenance Engineer assisting him in one particular area.

1.2 He shall work on maintenance in one of the following areas:

a) Baglung, Mustang, Myagdi, Parbat
b) Gorkha, Lamjung, Manang, Syangja, Tanahun
c) Kaski, Argha Khachi, Gulmi, Nawal Parasi, Palpa

2. Informing the District Panchayat

He shall explain the whole maintenance concept to district officials.

3. Project Preparation

3.1 He shall be involved in all kinds of surveys in his working area and he must submit survey reports to the Maintenance Engineer.

3.2 He shall explain the maintenance concept, re-install responsible Water Supply and Sanitation Committees, assist in selection of capable VMW and proceed the Village Maintenance Agreement in each completed CWSS project of his area.

3.3 He shall prepare design and estimate for each maintenance project.

4. Supervision

4.1 He shall visit each rehabilitation project every three weeks and each major project at least once during repair construction phase.

4.2 He shall make villagers aware of importance of proper maintenance on village level and keep close contact to Water Committee and VMW.

4.3 He shall supervise technical status of all completed projects and VMW's performance on regular and repair maintenance at least once a year. He must keep records about his visit which shall be filled in evaluation forms.

4.4 He shall invite little or non-experienced VMW to join our next VMW Training Course.

4.5 He shall consult the Maintenance Engineer for any difficult technical problems.

5. Project Monitoring, Progress Reporting and Completion

5.1 After each supervision tour to a rehabilitation project he shall submit a supervision report to the Maintenance Engineer.

5.2 After total completion of a rehabilitation project he, in company with the Maintenance Engineer, WSST and Committee Chairman should do an inspection tour of the whole system and complete the Project Completion Certificate if satisfied.

5.3 After completion of a major repair project he shall totally inspect the system and submit a Repair Completion Certificate to the Committee and a final report to the Maintenance Engineer.

5.4 He shall regularly inspect the financial records of rehabilitation projects, tools and materials records in the village and in the District.

5.5 He shall report any mishandling of funds or materials to the Maintenance Engineer.

5.6 He shall report to the LDO and the Maintenance Eng. if the project village does not conform to its Village Maintenance Agreement.

6. Other Maintenance Activities

6.1 He shall evaluate and assess all completed projects in his area and present evaluation reports to the Maintenance Engineer.

6.2 He, together with the Maintenance Engineer, shall be involved in VMW Training and WSST Training Courses by improving the present curriculum and teaching.

6.3 He, together with the Maintenance Engineer, shall propose improvements of standardization and more efficient procedures.

7. Sanitation

7.1 He shall encourage the villages in construction and use of pit latrines.

7.2 He shall ensure that the WSST properly constructs a pit latrine.

7.3 He shall encourage school teachers to devote time to sanitation and health education.

.....	.....
date, place	date, place
.....	.....
CWSS Project Manager/ Divisional Engineer	Regional Director

3.4.3 Maintenance Water Supply and Sanitation Technician

Job Description:

The Maintenance WSST will be assigned to supervise and work on a rehabilitation project or on major repair projects. For rehabilitation projects the job description developed by the Jhapa Conference shall be sufficient. The following outline describes only special extra duties and responsibilities of the Maintenance WSST.

1. Project Assignment

The Maintenance WSST shall work under supervision of one Maintenance Supervisor and shall be assigned to a maintenance project by the Maintenance Engineer.

2. Informing the Village

He shall assist the Maintenance Supervisor in his responsibility to explain the maintenance concept and to install a village level maintenance programme with a further responsible Water Supply and Sanitation Committee and a keen VMW before any actual repair maintenance is executed.

3. Major Repair Projects

3.1 He shall meet with the Water Committee and organize a plan for collecting local materials and transporting materials from RD store. No transport costs are paid in case of major repair projects.

3.2 He, together with the Committee, shall organize village labour contribution. If it is a major repair project, there is no payment for labour.

3.3 He shall supervise and execute together with the villagers all maintenance repair work.

3.4 He shall train at least one VMW in regular and repair maintenance, who should become his Assistance during repair.

3.5 He shall look for caretaker of each tapstand and train him in tap maintenance.

3.6 He shall ensure that the VMW has the appropriate set of tools and spare parts.

4. Rehabilitation

In case of rehabilitation projects the above job description is employed.

5. Sanitation

In all maintenance projects Sanitation shall be introduced exactly in the same way as it is mentioned in the job description for WSST.

3.4.4 Village Maintenance Worker

Job Description:

The VMW is officially appointed by the Village Maintenance Agreement, Annex 9. The Water Supply and Sanitation Committee as well as RD Maintenance Section shall supervise his job performance.

1. The VMW is responsible for project operation and regular maintenance.

2. He shall perform routine maintenance according to the maintenance checklist, Annex 10.

3. He shall do minor repair e.g.

   - replacement of brass taps, stop cocks, washers, bolts, etc.
   - repair of any leaks (pipeline, water tank etc.).
   - small cement work like repair of broken covers and valve chambers.
   - he shall re-dig and cover exposed pipeline together with villagers.

4. He shall work together with appointed tapstand caretaker.

5. If he needs technical assistance or certain materials he shall ask direct to RD Maintenance Section for support by letter from Committee Chairman or his representative.

3.5 Training Requirements

Better project implementation and maintenance management should help to utilize more properly all inputs for the CWSS Programme. Referring to the assessment part of this study, training is required on all levels. The present cooperative relation with Panchayat Development Training Centre offers the opportunity to organize any course or seminar if budget application and allocation is undertaken jointly and in time. This was the main administrative problem which caused often frustration to instructors.

3.5.1 MPLD-RD Staff Seminar

Once a year a RD Staff Seminar should be held on CWSS under the following main Objectives: improvement of communication, development of more efficient procedures, introduction of new policy conceptions like maintenance or sanitation and general improvement of the CWSS programme. A Coordination Committee should prepare and organise the seminar in detail. Such a seminar should create group spirit in an open minded atmosphere by better understanding and learning from each other. The schedule should include also discussions on technical issues like supervision performance under certain aspects of the new maintenance concept and review of the present standardization.

A period of three to six days might be sufficient just before the new construction season starts.

3.5.2 WSST Refresher Training Course

This year the first WSST Refresher Training Course was held for experienced RD technicians. The course should be institutionalized because our assessment clearly shows that experienced technicians need further training as there are still too many shortcomings in construction.

Out of their evaluation experience the Maintenance Section should develop logistic materials for the next training and prepare some sessions like:

- How to prevent construction mistakes of spring catchment, tapstand, etc.
- Important maintenance aspects of different structures
- How to make villagers aware of maintenance during construction phase
- How to train VMW
- How to encourage the setting-up of the Village Maintenance Agreement.

3.5.3 VMW Training Course

During Plan Phase I and II the VMW Training Course should be further held under RD responsibility in close cooperation with PDTC.

Budget application in detail has to be done jointly in summary for the next Fiscal years' training course according to training needs defined by the Maintenance Section. Only essential materials which cannot be submitted by RD should be covered by an extra budget item. In future daily allowance of Rs. 15 and extra field allowance of Rs. 15 per trainee and day should be allocated. The present teachers' salary of Rs. 25 per unit should be a further incentive for Maintenance Engineer and Supervisors to perform a good training course. Only if that training course is not included in the regular programme of PDTC, some compensation should be added for them in the budget.

Potential trainees should be personally selected only by Maintenance Supervisors during their evaluation tours and introduction of the Village Maintenance Agreement. In case of projects still under construction only persons who have been recommended by RD project staff should be invited. Two months before the course starts the invitation letter should be sent directly from RD to Water Supply and Sanitation Committee Chairman mentioning the name of the invited person. District Panchayat should be informed by a separate letter about the course and the invited persons of its district. Maximum 35 VMW trainees should be invited for one course.

Training period should be four weeks during Maagh/Phagun, divided into three weeks theory and practical lessons and one week regular and repair maintenance performance in the three (Plan Phase I) or four (Plan Phase III) different project villages. Last developed course schedule, Annex 5, and course curriculum by Lekh B. Gurung (13) be the first steps in installing a proper programme. Maintenance Section staff should improve the curriculum and participate as instructors of the course. Social Aspects of regular and repair maintenance on village level should be taught by PDTC staff like in the past. Structured and unstructured VMW interviews might help improving the maintenance concept too.

For field training only villages were assessed as suitable in terms of village contribution and repair workload should be selected. The projects should be out of the major repair category. Each of the Maintenance Supervisors should guide a small group on project site after he has organized transport to the village. During field training one of the most important subjects has to be how to perform regular maintenance by using the Project Maintenance Checklist shown in the English version in Annex 10.

More than 130 projects have already been built by LDD/RD Pokhara. But so far only about 60 VMW have been trained but without any conceptional support. Being realistic, maybe only half of them are still performing their job. After the Maintenance Section has evaluated all completed projects they should investigate also the success rating of the VMW Training Course. If RD Pokhara wants to train at least one VMW per project it seems necessary to have probably two VMW Training Courses one year after the maintenance concept has been introduced because you have to keep in mind the running construction programme too.

At Plan Phase III the district should be ready to train VMW. But in that case first of all district has to be familiarized with RD projects and a close relationship has to be established.

3.6 Material Requirement

The following lists are a very rough quantity estimate of material requirements for maintenance activities of one year during Plan Phase I.

It is sensible to hand out a complete tool box to each Maintenance WSST, which he is personally responsible for, and not to have any more project tool boxes. This is also proposed for Project WSST because then if a VMW gets his separate maintenance tool box with some spare parts after the project is completed, the responsibility for the expensive tools is very clear and can be easily controlled by RD. According to our evaluation about one third of finished projects need a complete maintenance tool box and another 25% require at least some tools.

The material requirement is split up in HMG contribution and UNICEF contribution. Item numbers are according to RD Pokhara Standardization.

3.6.1 HMG Material Requirement

Materials for Rehabilitation and Repair Maintenance

Item	Description	Quantity
4	small slab frame	250 pc
5	big slab frame	150 pc
7	steel bar 6 mm	250 m
8	steel bar 10 mm	100 m

Item	Description	Quantity
9	wire mesh 1 mm	10 m^2
10	wire mesh 4 mm	10 m^2
11	polyetilene sheet	200 m^2
12	paint brush	10 set
13	bolt, washer, nut	400 set
14	binding wire	10 kg
15	nails	25 kg
16	spring fencing	27
36	GI elbow ø ½"	300 pc
37	GI elbow ø 1"	30 pc
38	GI elbow ø 1½"	30 pc
39	GI elbow ø 2"	20 pc
40	GI elbow ø 3"	5 pc
41	GI tee ø ½"	50 pc
42	GI tee ø 1"	20 pc
46	GI nipple ø ½"	400 pc
47	GI nipple ø 1"	30 pc
48	GI nipple ø 1½"	30 pc
49	GI nipple ø 2"	30 pc
51	GI socket ø ½"	300 pc
52	GI socket ø 1"	80 pc
53	GI socket ø 1½"	50 pc
54	GI socket ø 2"	30 pc
55	GI reducer ø ½-2"	20 pc
59	GI union ø ½"	100 pc
60	GI union ø 1"	30 pc
61	GI union ø 1½"	20 pc
62	GI union ø 2"	10 pc
64	GI bracket ø 2"	20 pc
65	GI bracket ø 3"	20 pc
66	GI end cap ø 2"	10 pc
117	cement (for major repair)	150 bag
31	kerosene	400 l

Tools for Rehabilitation and Repair

Item	Description	Quantity
1	showel	70 pc
2	pick axe	70 pc
3	crowbar	20 pc
4	steel pan	50 pc
5	sledge hammer 10 lbs.	15 pc
6	sledge hammer 8 lbs.	15 pc
7	sledge hammer ½ lbs.	100 pc

Item	Description	Quantity
8	stone cutting hammer	150 pc
9	stone chisel 6"	30 pc
10	stone chisel 12"	20 pc
11	stone chisel 24"	20 pc
12	building trowel	60 pc
13	pointing trowel	60 pc
14	finishing trowel	30 pc

Tools for the Personal Tool Box of all 7 Maintenance WSST

Item	Description	Quantity
14	finishing trowel	7 pc
15	mason square 12"	7 pc
16	mason string	7 ball
17	spirit level 12"	7 pc
18	plumb bob line	7 pc
19	nail removing hammer	7 pc
20	wood chisel 1" (handle)	7 pc
21	carpenter saw 16"	7 pc
22	steel brush	7 pc
23	soft brush 4"	7 pc
24	screw drive 8"	7 pc
25	steel scissor	7 pc
26	adjustable spanner 10"	14 pc
27	smooth steel file	7 pc
28	rough wood file	7 pc
29	concrete chisel 6"	7 pc
30	concrete chisel 8"	7 pc

15 Complete Maintenance Tool Boxes and Spare Parts for 30 Completed Projects

Item	Description	Quantity
12	building trowel	15 pc
13	pointing trowel	15 pc
14	finishing trowel	15 pc
26	adjustable spanner 10"	30 pc
27	smooth steel file	15 pc
	skreen 1mm/4mm	30 m^2
	nut, bolt, washer	150 set
	racksaw blades	200 pc
	GI fittings: elbow ½" socket ø ½", union ø ½"	300 pc (total)

Office Furniture and Requirements

Item	Description	Quantity
1	desk	4 pc
2	chairs	8 pc
3	large file shelf	2 pc
4	book shelf	1 pc
5	initial office requirements	-

3.6.2 UNICEF Material Requirement

Materials for Rehabilitation and Repair Maintenance

Item	Description	Quantity
31	GI pipe ø ½"	300 m
32	GI pipe ø 1"	200 m
33	GI pipe ø 1½"	300 m
34	GI pipe ø 2"	150 m
35	GI pipe ø 3"	50 m
71	HDP pipe ø 20mm (IV)	7000 m
72	HDP pipe ø 32mm (III)	3000 m
73	HDP pipe ø 50mm (III)	4000 m
74	HDP pipe ø 63mm (III)	2000 m
75	HDP pipe ø 90mm (III)	300 m
76	HDP pipe ø 32mm (IV)	1000 m
77	HDP pipe ø 50mm (IV)	1000 m
78	HDP pipe ø 63mm (IV)	500 m
80	Flange set ø 50mm	50 pc
81	Flange set ø 63mm	40 pc
82	Flange set ø 90mm	5 pc
83	brass union ø 20mm	150 pc
84	brass union ø 32mm	50 pc
85	HDP tee ø 20mm	100 pc
86	HDP tee ø 32mm	30 pc
87	HDP tee ø 50mm	50 pc
88	HDP tee ø 63mm	20 pc
90	HDP reducer ø 20-32mm	200 pc
91	HDP reducer ø 32/50mm	150 pc
92	HDP reducer ø 50-63mm	50 pc
94	HDP end cap ø 20mm	20 pc
95	HDP end cap ø 32mm	10 pc
96	HDP end cap ø 50mm	10 pc
97	HDP end cap ø 63mm	5 pc
99	gate valve ø 1½"	20 pc
100	gate valve ø 2"	25 pc
101	gate valve ø 3"	5 pc
102	globe valve ø 1"	25 pc

Item	Description	Quantity
103	stop cock ø ½"	100 pc
104	air valve ø 3/4"	20 pc
105	float valve ø ½"	10 pc
106	brass tap ø ½"	150 pc
117	cement (rehabilitation projects)	700 bags

Tools for the Personal Tool Box of all 7 Maintenance WST

Item	Description	Quantity
110	complete tool box	7 pc
111	kerosene stove	7 pc
112	heating place and telefon paper	7 pc
113	thermochromecrayon	7 pkt
114	putty compound	7 tin
115	hemp	4 ball
116	Geberit knife	7 pc

15 Complete Maintenance Tool Boxes and Spare Parts for 30 Completed Projects

Item	Description	Quantity
110	complete tool box	15 pc
111	kerosene stove	15 pc
112	heating plate + teflon paper	15 pc
	teflon paper extra	30 pc
113	thermochromecrayon stick	30 pc
114	putty compound	5 tin
115	hemp	54 ball
116	Geverit knife	15 pc
83	brass union 20 mm	60 pc
84	brass union 32 mm	30 pc
	stop cock washer	300 pc
	brass tap washer (size 1, quality)	300 pc
85-92	HDP fittings: tees, reducer	300 pc (total)

3.7 Tentative Maintenance Budget for RD Pokhara

The presented tentative maintenance budget should give you a general view on the expected costs of the implementation of Plan Phase I. Approximately 130 CWSS projects have been already built. Table 24 shows that the assumed work load of around 40% of the projects are

expected as rehabilitation projects. In the assessment part it is said that 16% of the projects are non-functioning and 35% have major flaws. Out of these two classifications appr. 40% of all projects might be over the 8,000 Rs. limit for major repair projects. Rehabilitation of previous regular projects can be very expensive either if old structures are almost completely broken down or the Maintenance Engineer/Supervisor does not want to improve old structures upto an almost sufficient level but prefers to build complete new structures. 10% of the projects have been estimated as village level repair and another 10% as well functioning. The remaining 40% projects are in the category of major repair projects.

The required manpower might be able to execute the present workload of rehabilitation projects within 6 years and of major repair within 3 years time. This estimate does not include future projects which might need some maintenance repair during that time as well.

TABLE 24 : Expected Workload

category	estimate cost	Workload		Manpower	Implementation per year	Expected time period
		(%)	projects			
rehabilitation	> 8,000 Rs.	40	52	4 WSST	9	6 years
major repair	500-8,000 Rs.	40	52	3 WSST	18	3 years
village level repair	< 500 Rs.	10	13	VMW	-	-
non-repair	0	10	13	VMW	-	-

3.7.1 Rehabilitation Projects

1. HMG Contribution	1 project	9 projects
WSST, 6 month	3900	
Skilled labour	3500	
semi-skilled labour	3000	
transport to village	5000	
transport with vehicle	5000	
GI fittings	500	
other materials	10000	
tools	2000	
contingencies	3100	
TOTAL	36000 Rs.	324000 Rs.

2. UNICEF Contribution		
HDP pipes	33500	
HDP fittings and valves	6700	
GI pipes	2300	
cement	10000	
other materials	2000	
contingencies	5500	
TOTAL	60000 Rs.	540000 Rs.

3.7.2 Major Repair Projects

1. HMG Contribution	1 project	18 projects
WSST, 1 month	650	
HMG Materials	2000	
Cement	1100	
10% contingencies	350	
TOTAL	4100 Rs.	73800 Rs.

2. UNICEF Contribution	1 project	18 projects
HDP pipes	1000	
HDP fittings and valves	500	
GI pipes	1000	
Other materials	200	
10% contingencies	300	
TOTAL	3000 Rs.	54000 Rs.

3.7.3 Village Level Repair

1. HMG Contribution

Material for repair initial tools and spare parts for VMW	3000 5000	
TOTAL		8000 Rs.

2. UNICEF Contribution

Material for repair initial tools and spare parts for VMW	3000 25000	
TOTAL		28000 Rs.

3.7.4 Initial Requirements and Facilities

1. HMG Contribution

Office furniture and requirements	5000	
Tools for 7 Maintenance WSST	3000	
TOTAL		8000 Rs.

2. UNICEF Contribution

Tools for 7 Maintenance WSST	10000 Rs.

3.7.5 Budget Summary

This tentative budget requirement, table 25, is presented for two years including 15% inflation rate for the second year.

TABLE 25 : Tentative Budget Requirement for Two Years

	HMG Contribution		UNICEF Contribution	
	1st year	2nd year	1st year	2nd year
9 rehabilitation projects	324000	370000	540000	620000
10 major repair projects	74000	85000	54000	60000
village level repair	8000	10000	28000	30000
initial requirements	8000	-	10000	-
contingencies	6000	5000	8000	10000
TOTAL (NC Rs.)	420000	470000	640000	720000

3.8 Subsidiary Requirements

Three important side requirements have to be mentioned, which might be very helpful in general for the programme.

1. Administrative Procedures

Very often administrative procedures create communication gaps. Sometimes there are important project documents kept in administration files but the concerned Engineer is not informed.

The general principle should be that the Administration helps and supports the demands of the CWSS Programme, which is executed by the Technical Division. It is proposed that all informations regarding future projects, projects under construction and completed projects should be passed on to Project Manager/Divisional Engineer and should end up in the only one project original file kept by the concerned Project Engineer or Maintenance Engineer.

2. Filing System

At present RD Pokhara has 40 projects under construction, many projects have been surveyed and some 130 projects have been completed, but still no proper

filing system is developed. You have to be an experienced detective to find out only very simple matters. This fact hampered this study quite a lot. The authors would ask Regional Director, Project Manager/Divisional Engineer, all Engineers and Section Officer to sit together and develop as soon as possible an appropriate filing system maybe on basis of a draft proposal done by one Project Engineer and the Section Office only.

3. Maps

So far the Regional Directorate implements CWSS Programme, ILO Irrigation Programme and School Roofing Projects in its Development Region under the Ministry of Panchayat and Local Development. Good maps are an important resource for executing local development activities and regional planning. Official attempts to get sufficient maps, which cover the whole Development Region have not been successful yet. A minimum requirement would be to have District maps which show all Village Panchayats and the larger villages.

3.9 Two Examples of Implementation

3.9.1 CWS Project Ghan Pokhara, Lamjung District

Project Introduction

The project, built in 1979, consists of the following structures: spring catchment (appr. yield 0.25 l/s), $9m^3$ reservoir tank, 3.5 km pipe line, cleaning out, air valve, 3 tapstands.

There is a very skilled mistry in the village who has done almost all skilled labour work for the project but sometimes he is out of village. He may not need a VMW training course.

Case problems: broken old standard covers which do not fit; two stop cocks are not functioning; all stop cock chambers are too narrow for any maintenance; there were no brass unions available during construction phase so the temporary solution become permanent, these ad hoc joints leak causing water shortage in the dry season, neither cement nor any fittings are in the village.

What have the villagers done ?

They tried to repair the leaks. Three hours away from the village there was another LDM-CWS project under construction. The villagers asked the WSST to give some assistance but in case of these leaks in the narrow chambers even the WSST was not able to repair it. It would be necessary to destroy the whole stop cock chamber and the technician did not have any spare brass unions anyway. At the end they did not succeed in repair.

Maintenance is done only occasionally, e.g. if skreen on outlet of spring catchment is blocked by leaves, or only a little water flows only into the reservoir tank then the mistry or other villagers check the pipeline.

During monsoon there was a small landslide which exposed the pipeline but this was repaired by the villagers themselves.

No evaluation has been done yet. What to do ?

Maintenance Implementation

The responsible Maintenance Supervisor comes along to check the present state of that old CWS project. After he has inspected the whole system together with the former Water Committee Chairman and villagers who are familiar with their water system he calls for a project meeting with the whole villagers and especially the former Committee and the skilled mistry. During the meeting the Maintenance Supervisor tries to re-install the Water Committee for its maintenance task and to explain the need of regular maintenance. He hands out an official letter from RO which explains the new maintenance concept and introduces the Village Maintenance Agreement. These issues are discussed by the community meeting. If villagers, Committee and the officially appointed VMW agree on a reasonable payment in kind or cash to the VMW, that project is taken in consideration as a feasible maintenance project.

After his evaluation tour the Maintenance Supervisor does cost estimate for that project and together with the Maintenance Engineer they decide about the priority of that major repair project.

If, according to the priority list, the Maintenance WSST is free to work on that project then he prepares all necessary materials together with the Maintenance Section

and he sets out with his own tool box to the village. He sends an adequate number of villagers to collect the materials from RD or roadhead. The WSST works together with the VMW to improve his skill.

They, together with the villagers, destroy the stop-cock chambers, replace broken stop cocks and fit in brass unions. Instead of a new stock chamber a GI stop cock protection pipe according to Standardization of RD Nepalgunj and RD Biratnagar is place there. All the broken manhole covers are replaced by new slab frame covers. All maintenance tools are given under VMW's responsibility after the Village Maintenance Agreement has been signed and one copy has been submitted to LDO Lamjung.

At least once every year the Maintenance Supervisor inspects the whole project and keeps a record of the actual status. He must report to LDO Lamjung and RD Pokhara whether the Village Maintenance Agreement is followed well e.g. VMW performance, payment of salary, etc. He shall be always ready to advise the VMW and Water Committee if there are certain problems. If any major repair is required he should start the official procedure. When there is a serious breakdown the Water Committee Chairman or VMW should come straight to RD Pokhara or send a request letter.

3.9.2 CWS Project Gurungkha, Syangja District

Project Introduction

The project, built 1975/76, consists of the following structures: spring/stream catchment (appr. 0,3 l/s), appr. 7m^3 reservoir tank, 10 km pipeline, 4 tapstands.

That previous regular project was surveyed by hand level only and the construction quality is rather low.

Case problems: spring/stream catchment is extremely badly built and needs reconstruction. Due to hand level survey there are some serious pipeline shortcomings, pipeline goes along a dangerous almost inaccessible steep rock section, no cleaning out, no air valve, many leaks caused either by low pipe quality or high pressure, reservoir tank too small (appr. 90 houses) and construction shortcomings, wooden pillar tapstands, not enough water.

What have the villagers done ?

Villagers tried to change the pipeline route but they could not get either pipe nor technical assistance. They clean and check daily the spring catchment and regulate water flow from tank to tapstands.

Village level maintenance arrangement: There is a team of four VMW including team leader which acts as well somehow as Water Committee. They divided the pipeline in service sectors and each VMW is responsible for one. The inspection is performed daily but without almost any basic tools. Even the villagers (Gurung) are poor each house of the project area contributes regularly two paathi grain a year to the VMW. The VMW team leader participated on this year's VMW Training Course and got basic maintenance tools. The village requested officially for technical assistance to RD Pokhara.

Maintenance Implementation

Because of the serious water problem and the obvious enthusiasm of the villagers this project should be one of the top priorities for rehabilitation.

4. CONDITIONS FOR IMPLEMENTATION

CWSS project maintenance is a very urgent problem. Rural communities are suffering because of broken down projects. There must be no more delay in implementation. MPLD decision-makers are kindly asked to take into consideration the following conditions for implementation of this maintenance concept.

1. Organization and management structure at RD Pokhara during Plan Phase I/II must be as it is at present but with the addition of a Maintenance Section. If there is to be a Divisional Engineer, he should be the counterpart of the Project Manager in CWSS.

2. At present, experienced Overseers/Supervisors must not be posted to districts, because it will hamper implementation of construction and the setting-up of a maintenance programme tremendously. It has taken many years for RD Pokhara to reach its present functioning status. This should not be ruined by either too rapid or not well considered decentralization.

3. An MPLD maintenance policy conference on CWSS should come up with a national framework. Each RD should implement its maintenance programme according to its own office abilities.

4. The top authorities of MPLD should approve and encourage RD Pokhara to start tentatively implementing the maintenance management as proposed. Because there is already a CWSS project maintenance budget, an established VMW Training Course and a Maintenance Engineer, RD Pokhara should begin implementation this season 1981/82 and thus in being the forerunner try to establish a good approach to maintenance.

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ANNEXES

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
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ANNEX 1 (A1)
A1/1

COMPLETED PROJECTS

Dhaulagiri Zone
Baglung District

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution*	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
1.	Dhikichaur	Mulpani	030/033		-	+		Vertucci	March 1977 New ERA
2.	Harachaur	Mulpani	030/032		-	+		Vertucci	March 1977 New ERA
3.	Bunga Dobang W8	Bunga Dobang	031/036	+	-	-	-	P.Neupane M.R.Bhanbari	
4.	Bunga Dobang W9	Bunga Dobang	031/036	+	-	-	-	P.Neupane C.S.Gurung	
5.	Bhakunde Saure	Bhakunde Saure	031/032		-	+			
6.	Lekh Khani	Lekh Khani	034/035	+	+	+	-	C.S.Gurung	

* + : good

o : average

\- : bad

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COMPLETED PROJECTS

Dhaulagiri Zone
Mustang District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Lete	Lete	031/033		-				Feb. 1977 New ERA
2.	Chhaire	Marpha	029/029		-				Feb. 1977 New ERA
3.	Marpha	Marpha	032/033		-			O.P.Bhattachan	Feb. 1977 New ERA
4.	Phalyak	Kagbeni	031/033		-			none	Feb. 1977 New ERA
5.	Dhagarjung	Kagbeni	031/033		-				Feb. 1977 New ERA
6.	Dagar Jung	Dagar Jung	031/033		-				
7.	Chambuk Totang	Chambuk Totang	031/033		-				
8.	Tukuche	Tukuche	031/033		-				
9.	Lomang Thang	Lomang Thang	031/033		-				

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COMPLETED PROJECTS

Dhaulagiri Zone
Myagdi District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Jyamrukot/Arjun	Jyamrukot	029/031		-	+		Summer	March 1977 New ERA
2.	Kibang	Histan	029/031		-	+		Dennis Austin	March 1977 New ERA
3.	Gharamdi	Histan	029/031		-	+		Dennis Austin	March 1977 New ERA
4.	Narchhyang	Narchhyang	029/031		-	+		Dennis Austin	March 1977 New ERA
5.	Bhurung Tatopani	Bhurung Tatopani	029/031		-	+		none	March 1977 New ERA
6.	Kuhun	Kuhun	031/032		+	+		R.Fisser	
7.	Ghatang tinmane	Ghatang	031/032		+	+		R.Fisser	
8.	Bega	Bega	031/032		-	+			
9.	Badunk	Badunk	031/032		-	+			
10.	Pakhapani	Pakhapani	031/036		+	+		M.Budyak T.Pun	
11.	Ratne Chaor	Ratne Chaor	032/036	+	+		-	G.Pun	

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COMPLETED PROJECTS

Dhaulagiri Zone
Parbat District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Thamarjung	Ramja Tilahar	029/030		-	-		M.Gearhard	March 1977 New ERA
2.	Danabagar	Ramja Tilahar	029/030		-	-		T.P.Rimal	March 1977 New ERA
3.	Deurali	Deopur	030/031		-	+		M.Gearhard	March 1977 New ERA
4.	Gairathok	Deopur	030/031		-	+		M.Gearhard	March 1977 New ERA
5.	Ulleri	Dansing	030/031		-	+		D.Austin	March 1977 New ERA
6.	Dhairing	Dhairing	030/032		-	+		Vertucci	March 1977 New ERA
7.	Kyang	Kyang	035/035	+	+	+	-	F.Dubbeldam B.Gurung	Jan. 1981 L.B.Gurung
8.	Banung	Kyang	036/036	o	+	+	-	I.B.Khanal B.Gurung	Jan. 1981 L.B.Gurung
9.	Bhuka	Bhuka Deurali	035/035	+	+	+	+	M.Schmitz Kajiman J.T.	Jan. 1981 L.B.Gurung
10.	Wakithati Taltum	Wakithati	034/036	+	+	-	o	L.B.Gurung Subba Gurung	Jan. 1981 L.B.Gurung
11.	Durlung	Durlung	035/036		+	+		M.Schmitz	Jan. 1981 L.B.Gurung
12.	Khurkot Lampata	Khurkot	036/037		+			Binaya R.N.Baral	

Dhaulagiri Zone
Parbat District (Cont'd)

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
13.	Subedithar	Khurkot	036/038					Binaya/R.Bland Balaram	June 1981 R.Bland
14.	Wahakithati Deurali Ward No. 1,2,7,8,9	Wahaki	035/037		+	-	+	L.B.Gurung P.Shrestha	

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COMPLETED PROJECTS

Gandaki Zone
Gorkha District

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
1.	Badedanda Harmee	Palungtar,Ampipal	031/034	-	-	+	-	B.Joyce	March 1977 New ERA
2.	Bajredanda Chhepetar	Palungtar,Ampipal	029/030	o	-	+	-	M.Payne	March 1977 New ERA
3.	Phinam	Phinam	030/032		-	+		J.Daurio	March 1977 New ERA
4.	Okhale Kubindi	Tandrang	030/031		-	+			March 1977 New ERA
5.	Gaikhur	Gaikhur	029/031		-	+		M.Payne	March 1977 New ERA
6.	Upper Bhirsing	Kerabari	029/031		-	+		D.Emons M.Edene	March 1977 New ERA
7.	Lower Bhirsing	Kerabari	029/031		-	+		D.Emons M.Edene	March 1977 New ERA
8.	Taranagar Chhepetar	Taranagar Chhepetar	036/036		-	+		S.Gurung	
9.	Silling Manakamana	Manakamana	036/036		+	+		S.K.Lama	
10.	Bandre Danda	Bandre	030/032		-	+			
11.	Ajirkot	Ajirkot	030/032		-	+		Nick (PCV)	
12.	Jaubari	Jaubari	034/035		+	+		S.Adhikari	

Gandaki Zone
Gorkha District (Cont'd)

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
13.	Simjung W 1,2	Simjung	036/037					G.S.Pun P.B.Gurung	
14.	Saurpani W 3,4	Saurpani	036/037	o			-	G.S.Pun Bhupal	

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COMPLETED PROJECTS

Gandaki Zone
Kaski District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Yangjakot	Thumkodanda	029/031		+	+		L.Robertson T.B.Gurung	Feb. 1977 New ERA
2.	Arba Bijay W 1-6	Arba Bijay	028/031	o	-	+	+	Wallace/Steele	March 1977 New ERA Jan. 1981 W.Schramm
3.	Thuleswara (Gairabari)	Kalika	029/031		-	+		L.Robertson H.B.Gurung	March 1977 New ERA March 1981 L.B.Gurung
4.	Jhajermare	Kalika	028/030	-	-	-	-	L.Robertson	March 1977 New ERA Feb. 1981 L.B.Gurung
5.	Arwa W 7,8,9	Kalika	034/035	+	+	+	+	J.Bovier H.B.Gurung	Feb. 1981 L.B.Gurung
6.	Puranchaur	Puranchaur	028/029		-	+		Ferry/DeYoung	March 1977 New ERA
7.	Kavre Lampatan	Puranchaur	036/037		+			E.Kienzle	
8.	Takura Chmrunga	Puranchaur	036/037		+			R.K.Dhakal	
9.	Chapalthar	Lahachok	032/033	+	+	+	+	Eng.N.Jha K.Baral	March 1977 New ERA

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
10.	Taprang/Chipli	Sildujure	035/035	+	+	+	+	H.Mengers J.Bovier	March 1981 L.B.Gurung
11.	Taprang W7	Sildujure	034/035	+	+	+	-	H.Mengers S.K.Lama	March 1981 L.B.Gurung
12.	Taprang W2-6	Sildujure	035/036	o	+	+	-	H.Mengers Subba/K.Baral	March 1981 L.B.Gurung
13.	Ghalel/Emu Takru	Lang Ghalel	034/035	o	+		-	H.Mengers	
14.	Ghalel Kinbang	Lang Ghalel	035/036	+				L.J.Gurung	
15.	Gyamrang	Namar Jung Deorali	034/035	+	+	+	-	J.Bovier T.Gurung	March 1981 L.B.Gurung
16.	Sundaridanda	Begnas	035/035	-	+	+	-	H.Mengers Ratna	Nov. 1980 W.Schramm
17.	Naudanda Serachour	Dhikur Pokhari	035/036	o	+	+	-	K.J.Thapa	Jan. 1981 L.B.Gurung
18.	Bhumdi	Pumdi Bhumdi	036/036	+	+	+	+	J.Niederer S.B.Chhetri	March 1981 L.B.Gurung
19.	Thalo Hyanja	Hyanja	035/036	+	+	+	+	J.Niederer Bhupal	Feb. 1981 W.Schramm
20.	Mohariyatole	Dansing	035/036	+	+	+	-	C.S.Gurung	Jan. 1981 L.B.Gurung
21.	Kandanidanda Timpiple	Rakhi	036/036	-	+	-	-	H.Mengers D.Rana	Nov. 1980 W.Schramm
22.	Rakhidanda/ Tallothar	Rakhi	035/036	-	+	-	-	S.Adhikari K.Sing	Feb. 1981 W.Schramm

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
23.	Nirbane	Chapakot	036/036	o	+	+	+	P.Neopane N.Bahadur	Feb. 1981 L.B.Gurung
24.	Sikklis Dhaprangthar	Parche	036/036		+	-	-	S.Adhikari K.Gurung	March 1981 L.B.Gurung
25.	Sikklis, W 5,6,8,9	Parche	036/037	o	+	-	-	S.Adhikari H.B.Gurung	March 1981 L.B.Gurung
26.	Lamachour Gharmi	Armala Charapani	036/037	-	+	-	-	B.B.Rana	
27.	Bhadaure Tamagi	Bhadure T./ Salyan	036/037	o	+	-	-	I.Khanal B.B.Ale	Jan. 1981 L.B.Gurung
28.	Damdame Kutbidanda	B.Tamagi	036/037	+	+	-	-	I.Khanal K.J.Thapa	
29.	Bharat Pokhari	Bharat Pokhari	036/037	-	+	-	-	S.Adhikari T.Pun/Kedar B.	
30.	Parchegaau	Parche	036/037					S.Adhikari K.B.Gurung	
31.	Landruk	Lumle	036/037	o	+		+	I.Khanal D.B.Rana	Jan. 1981 L.B.Gurung
32.	Bhalam Bandakhor	Kahu Bhalam	032/033	-	+	+	-	N.Jha B.Shrestha	
33.	Harpak	Harpak	035/037	o	+		-	I.Khanal C.Sing/ I.B.Thakali	
34.	Rupakot	Bhirkot	036/037	+	+		-	S.Adhikari	

Gandaki Zone
Kaski District (Cont'd)

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
35.	Purunchour	Purunchour	036/037						
36.	Lukumswara	Pumdi Bhumdi	035/038		+				
37.	Kritinachnechour	Kritinachnechour	037/038	+	+		+	S.Gurung	

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COMPLETED PROJECTS

Gandaki Zone
Lamjung District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Chiti Tilahar	Chiti Tilahar	032/035	-	-	+	+	Bhupal Danai	
2.	Tarkughat Birbhakta	Raginash	035/036	-	+	+	-	E.Schouwerwou S.Gurung	
3.	Ghan Pokhara	Ghan Pokhara	036/036	+	+	+	+	W.Schramm L.J.Gurung	
4.	Thuli Besi	Bahundanda	036/036	+	+	+	+	W.Schramm M.B.S.Magar	
5.	Kalainche	Maling	036/036	+	-	-	-	W.Schramm L.J.Gurung	
6.	Lama Manjang	Pyardi	037/038	+			+	N.Babu S.K.Lama	

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Gandaki Zone
Manang District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Upallo Pisang	Ghyaru	035/036	+	+	+	-	J.Wiederer D.Rana	
2.	Thonche	Thonche	035/036	-	+	-	-	W.Schramm M.B.Sotti Magar	
3.	Nache	Nache Dharapani	035/037	o	+		+	Bhupendra/ Dennis H. M.B.S.Magar	
4.	Bojo	Manang	037/037	-	+		-	I.Karnal Ballaram	May 1981 H.Müller

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COMPLETED PROJECTS

Gandaki Zone
Syangja District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Karkineta Kamitole	Karkineta	035/036	+	+	+	-	C.S.Gurung	L.B.Gurung Dec. 1980
2.	Gaiya Bahakot	Gaiya Bahakot	035/036	+	-	+	+	R.B.Chhetri	L.B.Gurung Dec. 1980
3.	Armadi Sirubare	Baraha Kalika	035/036	-	+	-	+	S.B.Chhetri	L.B.Gurung Dec. 1980
4.	Armadi Mohadanda	Baraha Kalika	036/037	o	+	-	-	S.S.Gurung	L.B.Gurung Dec. 1980
5.	Dhatum High School	Darsing	036/037	o	+		-	I.B.Khanal P.B.Thapa	L.B.Gurung Dec. 1980
6.	Jagatpur	Darsing	036/037	o	+		+	L.B.Gurung Kajiman J.T.	L.B.Gurung Dec. 1980
7.	Rangethati Lakore	Seti Dobhan	036/037	-	+	-	-	Shah P.B.Thapa	L.B.Gurung Dec. 1980
8.	Rangethati Ghaganpani	Seti Dobhan	036/037	-	+	-	-	Shah Padam B.Thapa	L.B.Gurung Dec. 1980
9.	Gurungkha	Shirsikot	031/033	+	+	+	+	K.Baral	L.B.Gurung Dec. 1980
10.	Naudanda	Ganeshpur	036/037	o	+		+	B.Shah Genindra	
11.	Chang Changdi	Baraha Kalika	037/038	o	+		-	S.B.Chhetri Subedi	

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COMPLETED PROJECTS

Gandaki Zone
Tanahun District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Dumre Bazaar	Bandhipur	033/035	o	+	+	+	J.Bovier P.B.Thapa	
2.	Tharpa Bazaar	Chang	035/035	+	+	+	+	B. Danai	
3.	Bhange Satrasaya	Bhange Satrasaya	035/036		-	+	+	S.Adhikari	
4.	Kihu Badhare	Kihu Badhare	031/035	-	+	+	-	L.B.Gurung R.B.Chhetri	
5.	Jyamruk Bahepani	Jyamruk	031/034		-	+	-	B.B.Thapa	
6.	Jyamruk Rupakot	Jyamruk	031/034		-	+		B.B.Thapa	
7.	Bhansar	Bhansar	032/036	o	-	+	+	R.N.Baral	
8.	Syamgha Hatiya	Syamgha Hatiya	032/034	o	+	+	-	K.Baral	
9.	Hile Tar	Hile Tar	034/034	+	+	+	+	R.B.Thapa	
10.	Landari Bg.	Chisapani	036/038		+			G.S.Pun K.B.Gurung	
11.	Gahateri	Chisapani	036/037	o	+		+	G.S.Pun K.B.Gurung	

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
REGIONAL DIRECTORATE
POKHARA

COMPLETED PROJECTS

Lumbini Zone
Argha Khachi District

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
1.	Dhikura	Dhikura	032/035		+	+		Eng. Jha	

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
REGIONAL DIRECTORATE
POKHARA

COMPLETED PROJECTS

Lumbini Zone
Gulmi District

No.	Project	Village Panchayat	Started/ Completed	Village Contri-bution	Pro-ject File	Hand-ing Over	VMW	Supervisor WST	Evaluation Done
1.	Juniya	Juniya	032/035		+	+	+	J.Mahatto	Feb. 1981 H.Veerdig
2.	Bharse Gupha	Bharse	032/036		-	+	-	R.S.Yadav	Feb. 1981 H.Veerdig
3.	Dabhung	Bharse	035/038	-	+			K.Thapa H.Veerdig	
4.	Kwangdi	Santipur	036/038	+	+			R.B.Gurung H.Veerdig	

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
REGIONAL DIRECTORATE
POKHARA

A1/18

COMPLETED PROJECTS

Lumbini Zone
Nawal Parasi District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Bada Jheri	Bullingtar	032/034	o	-	+	-	N. Jha K. Baral	Feb. 1981 L.B.Gurung

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
REGIONAL DIRECTORATE
POKHARA

COMPLETED PROJECTS

Lumbini Zone
Palpa District

No.	Project	Village Panchayat	Started/ Completed	Village Contribution	Project File	Handing Over	VMW	Supervisor WST	Evaluation Done
1.	Somadi	Somadi Bhanjyang	031/033		+	+			March 1977 New ERA
2.	Barjakot	Gadhakot	032/034		-	+	+	N.Jha M.Miller	Feb. 1981 L.B.Gurung
3.	Phoksingkot	Gadhakot	031/033	+			+	N.Jha M.Miller	Feb. 1981 L.B.Gurung
4.	Rupse/Sapandi	Chidipani	029/032				-	N.Jha G.B.Rana	Feb. 1981 L.B.Gurung
5.	Rupse/Amarahi	Chidipani	029/032				+	N.Jha G.B.Rana	Feb. 1981 L.B.Gurung
6.	Paekdedha Dobhan	Paekdedha Dobhan	031/035		+	+	+	C.S.Gurung	March 1981 L.B.Gurung
7.	Madan Pokhara	Madan Pokhara	036/037	o	+		+	G.Marks H.Gurung	

Draft Research Proposal

On

Village Case Study for a Feasible Maintenance Management Set Up of Community Water Supply (CWS) Projects in the Western Development Region

Ministry of Panchayat and Local Development
Regional Directorate Pokhara
Western Development Region

Centre for Economic Development and Administration
Tribhuvan University
Kirtipur, Kathmandu
P.B. No. 797
NEPAL

FIRST DRAFT PROPOSAL

Village Case Study for a Feasible Maintenance Management set up of Community Water Supply Projects on Village Level in the Western Development Region, Nepal.

Introduction

His Majesty's Government recently created the Ministry of Panchayat and Local Development (MPLD) out of the former Local Development Department (LDD). Under this Ministry there are at present four Regional Directorates (RD) for the Eastern, Central, Western and Far Western Development Region.

For almost ten years LDD was/MPLD is mainly engaged in Rural Community Water Supply (CWS) which is contributed by HMG and UNICEF. During that time LDD Pokhara has executed more than 130 village water supply schemes as gravity systems only in Western Development Region. HMG, UNICEF and the villagers have invested a lot of money and work but even so till now nobody feels really responsible maintaining the water system. Because of this we can roughly estimate that 50% of all old projects are broken down or they have major flaws. These days there is a little bit more awareness on maintenance problems and this has led to the request of a MPLD high level conference for a maintenance management set up in each Development Region. Hence, it has been asked to develop a proposal for a system of maintenance and repair management by MPLD RD Pokhara for the Western Development Region. This task includes also a technical evaluation of completed projects. Out of the general technical and non-technical present state the set up should enable MPLD to deal with maintenance in future. This requires specific criteria for dividing responsibilities at village level and responsibilities outside the village. This cannot be done only by a technical evaluation and should not be done neither by MPLD, say a government agent, nor by a foreigner.

Objectives:

Setting up proposal for a feasible maintenance management system of CWS projects on village level:

1. Evaluation of 10 completed CWS projects regarding social, cultural, economical and political implications from the very beginning of the project request till the present status.

2. Assessment of non-technical matters which influence maintenance arrangements at post construction phase.

3. Proposal and recommendations for a feasible maintenance management set up on village level in order to keep CWS systems well maintained.

Approach - Scope of the Study:

1. Descretion and Assessment of General Conditions of each sample CWS project area.

1.1 Social/cultural conditions

ethnic caste groups, local habits, intercaste relations, community spirit, faiths and beliefs, in water, solving problems, traditions of self-help labour, responsibility for common goods.

1.2 Economical Conditions

average income, variation of annual incomes per family, sources of income/kind of income, cash money, local tax system or any cash contribution.

1.3 Political conditions

village panchayat, political groups, village leaders, influence from outside, committees, local initiative and responsibility, activities carred out by the village and their organisation, priority of development needs.

2. Description and Assessment of Non-technical Matters

Water Supply Schemes

2.1 Request

motives, priority for villagers, by whom and in which way requested.

2.2 Village participation

pre-construction phase, construction phase and post construction phase, reasons for poor or enthusiastic participation.

2.3 Relation MPLD-RD staff-villagers

Role, authority of MST/Supervisor, cooperation, problems.

2.4 Village institutions

village panchayat and other institutions/authorities, their role and ability to cope with a water supply project, Water Committee: motivation, influence, authority, ability.

2.5 Traditional rules and laws effecting the CWS project e.g., Women's task drawing water, is there any pressure on men to carry out construction and repair, cast rules.

2.6 Disputes, vandalism and other hampering factors causes, effects.

2.7 Actual benefit for the people.

2.8 Does villagers/village panchayat really feel it is their own water system ?

3. Recommendations and Detail Approach on Maintenance Management on Village Level

3.1 General capability/involvement after the CWS project is finished awareness, understanding of routine maintenance duties, protection of catchment area (afforestation) and other structures, preventing improper water use, security of village participation, protection of vandalism and any problems effecting maintenance.

3.2 Essential requirement during pre-construction phase and construction phase to ensure proper maintenance afterwards.

3.3 Village organisation and responsibility

village agent who is able to deal with maintenance, written agreements/contracts and their practical use, responsibility for tools and others given from MPLD-RD.

3.4 Local village water tax or any payment system for maintenance possibilities: voluntary or compulsory (force ?), kind of construction, need of HMG rule/law, payment for a village maintenance worker, payment for replacement of broken faucets, role of Village Panchayat and other authorities.

3.5 Required manpower for the maintenance of the project

Village Maintenance Worker: selection of the right person who is recident in the project village or village panchayat, his qualification, status, authority, kind of employment, his supervisor, taps and caretaker: appointment, voluntary responsibility.

Methodology:

1. Analysis and interpretation of obtained data and information by primary and secondary sources.

2. Apart from collecting the available necessary secondary data from the offices in the centre and regional, the questionnaire will be administered to the different government offices and other related institutions in the study areas.

3. In the effort to finding out socio-economic characteristics and conditions of the people living in the study area, a household survey would be done, on the basis of a sampling frame.

Manpower Requirement for the Project

A project of this nature would be best served by an inter-disciplinary team. As such, it is proposed that a taskforce be constituted representing the following disciplines: (a) Economic, Political Science (b) Social anthropology or sociology, and (c) Engineer etc.

Types of Expert/ Required Manpower	Number of Required Manpower/Expert	Sources for Expert/Manpower	Required time (Months)
Political Scientist	1	CEDA	6
Economist	1	CEDA	6
Social Anthropology or sociologist	1	CEDA	6
Engineer	1	Regional Directorate, Pokhara	6
Research Assistants	..	to be hired	6

Duration of the Study

The total study period will be six months for this project. The detail time schedule is as follows:

Activities \ Time schedule (months)	1	2	3	4	5	6
Preliminary data collection and preparation of questionnaire						
Field Survey						
Primary data tabulation and analysis						
Draft Report						
Final Report						

ESTIMATED BUDGET

1.	**SALARY**	Rs. 34,000/-
	One Economist Rs. 1500/month for 6 months (Rs. 1500 x 6)	Rs. 9,000/-
	One Sociologist Rs. 1500/month for 6 months (Rs. 1500 x 6)	Rs. 9,000/-
	Two Research Assistants Rs. 600/month for 6 months (6 x 2 x 600)	Rs. 7,200/-
	One Political Scientist for six months	Rs. 9,000/-
2.	**PROJECT ALLOWANCE**	
	a. For the Project Director 50% of the salary	Rs. 4,500/-
	b. Provident fund 10% of the salary of Economist and Sociologist	Rs. 1,800/-
3.	**DAILY ALLOWANCE**	Rs. 5,200/-
	a. DA for Economist and Sociologist Political Scientist Rs. 30/day for 30 days (3 x 30 x 30)	Rs. 2,700/-
	b. DA for 2 RA Rs. 25/day for 30 days (2 x 25 x 30)	Rs. 1,500/-
	c. Provision for Remote Area Allowance	Rs. 1,000/-
4.	**TRAVELLING ALLOWANCE**	Rs. 4,600/-
	a. Air tickets for 4 persons Rs. 600/- round trip Kathmandu-Pokhara-Kathmandu (4 x 600)	Rs. 2,400/-

b.	TA for Economist and Sociologist Rs. 4/mile for 100 miles (2 x 4 x 100)	Rs.	800/-	
c.	TA for 2 RA Rs. 3/mile for 100 miles (2 x 3 x 100)	Rs.	600/-	
d.	Provision for Remote Area Allowance	Rs.	800/-	
5.	LOCAL TRANSPORTATION			Rs. 2,000/-
6.	PRINTING AND STATIONERY			Rs. 10,000/-
7.	MISCELLANEOUS			Rs. 1,000/-
		Sub-Total		Rs. 63,100/-
8.	CONTENGENCIES 10% of the sub-total			Rs. 6,310/-
		GRAND TOTAL:		Rs. 69,410/-

NOTE: The budget for the Engineer has not shown in this budget.

MINISTRY OF PANCHAYAT AND LOCAL DEVELOPMENT
REGIONAL DIRECTORATE
POKHARA

COMMUNITY WATER SUPPLY PROGRAMME

PROJECT STATUS REPORT

Zone: ..... Reporting Date: .....

District: ..... Reporter: .....

Project:.....

A. GENERAL INFORMATION

1. Location:

   a) Panchayat: Ward No.:

   b) Villages served:

   c) nearest roadhead: distance:

      nearest airport: distance:

      District: distance:

      RD Pokhara distance:

   d) brief route description

2. General Village Information

   a) major ethnic groups in project area.

      1st: 2nd: 3rd: 4th:

   b) settlement pattern:

   c) major sources of villager's income:

   d) major crops grown by the villagers:

   e) economic condition (relative to Hill Nepal):

   f) what do villagers think about sanitation ?

g) do villagers have latrines and do they use them ?

3. Names of Responsible Individuals:

a) Pradhan Pancha: interested ?

b) Panchayat Secretary: interested ?

c) Water Committee Chairman: interested ?

d) Maintenance Worker: interested ?

e) Important villagers:

f) LDD Eng./Supervisor:

g) LDD WST:

B. GENERAL TECHNICAL DESCRIPTION

1. Project history (dates):

a) Village Panchayat decision to ask for the project:

b) District Panchayat approval:

c) first survey performed: additional surveys:

d) construction begun:

e) construction completed:

f) inspected/certified by LDD Engineer: yes/no

2. Number of served households:

3. Water source: spring stream appr. yield:

4. Type of system: open closed

5. Type of pipe: HDP PVC GI combination

6. Length of the system:

7. Components (number of):

a) spring/stream catchment: b) collection chamber:

c) gate valve: d) air valve: e) cleaning out:

f) reservoir tank m^3: g) break pressure tank:

h) interruption chamber i) taps: j) stopcock chamber:

8. Additional water use:

a) kitchen garden irrigating: b) field irrigation:
c) other

C. ASSESSMENT OF PRESENT CONDITION

1. Adequacy of flow:

a) adequate supply of water year round:
b) supply seasonally inadequate in month of:
c) supply inadequate year round:
d) comment:

2. Water Quality Condition:

a) visual/physical test

sample taken from	turbidity sand silt clay	colour	taste	odour
source:	.....			
reservoir:	.....			
tap no. 1:	.....			

3. Assessment of watershed conditions (yes/No):

a) status checklist

- sufficient vegetation in watershed area preventing erosion:
- watershed area free of signs of animal grazing:
- watershed area free of trails:
- watershed area free of houses:
- watershed area adequately fenced:

b) general assessment (yes/no)

- virtually no danger of contamination from watershed area:
- some danger of contamination from watershed area:
- serious danger of contamination from watershed area:

c) comment (situation during monsoon, etc.)

4. Assessment of spring/stream catchment:

a) description of catchment structures e.g. sketch, materials

b) status checklist

- construction of water collection well built:
- intake chamber
- adequately roofed and sealed to prevent contamination:
- status of manhole covers:
- easy access for cleaning:
- cleaning out, overflow, outlet functioning:
- area is free of erosion caused by overflow and cleaning out:
- intake free of slime or animal life:
- surrounding area properly graded for drainage:
- catchment free of leaks:
- screen over tank outlet pipe:

c) general assessment

	satisfactory	some shortcomings	serious shortcomings
design	.....		
construction	.....		
maintenance	.....		

d) items necessary to repair the catchment

e) comment

5. Assessment of reservoir tank

a) description of reservoir tank
b) status checklist
- adequately roofed and sealed to prevent contamination:
- status of manhole cover:
- adequately ventilated by properly screened holes:
- accessible for cleaning purposes:
- evidence of recent removal of slime and sediments:
- cleaning out, overflow, outlet functioning:
- free of animal life:
- overflow, cleaning out arranged to avoid erosion:
- surrounding area properly graded for drainage:
- free of leakage:
- screen over tank outlet pipe:

c) general assessment

	satisfactory	some shortcomings	serious shortcomings
design	.....		
construction	.....		
maintenance	.....		

d) items necessary to repair reservoir tank.

e) comment

6. Assessment of break pressure tank (BPT)/interruption chamber (IC)

a) description of BPTs/ICs

b) general assessment

	satisfactory	some shortcomings	serious shortcomings
design	.....		
construction	.....		
maintenance	.....		

c) items necessary to repair BPTs/ICs

d) comment

7. Assessment of Valves and Valve Chambers

a) description of valves (number, diameter, etc.)

- gate valves:
- air valves:
- cleaning outs:
- stopcock valves:

b) status checklist (how many yes/how many no)

- valves enclosed in secure chambers:
- how many chambers are actually closed:
- status of covers:
- valves oiled and cleaned:
- valves functioning:

c) general assessment

	satisfactory	some shortcomings	serious shortcomings
design	.....		
construction	.....		
maintenance	.....		

d) items necessary to repair valves and valve chambers

e) comment

8. Assessment of pipeline

a) general description of pipeline

b) status checklist
- pipeline properly buried:
- pipeline free of leaks and cuts:
- ground cover restored over trench line:
- pipeline avoids areas of flood, landslide, erosion
- flow uninterrupted by pipeline deficiencies:
- exposed pipe free of discolouration (PVC pipe only):
- GI pipe well fixed and joined:
- rivercrossing properly built:

c) If pipeline passes through areas which are vulnerable to landslide, what measures have been taken to protect the pipe from damage

d) general assessment

	satisfactory	some shortcomings	serious shortcomings
design	.....		
construction	.....		
maintenance	.....		

e) items necessary to repair pipeline

f) comment

9. Assessment of taps and tapstands

a) description of taps and tapstands (number, type of construction, type of tap, etc.)

b) status checklist tap no. 1 2 3 4 5 6 7 8 9

- tap provide adequate flow .....
- stopcock are functioning .....
- stopcock chamber well covered .....
- tapstands in good repair .....
- area properly paved .....
- waste water properly drained .....
- runoff water productively used .....
- (brass) tap is working .....

c) General assessment

	satisfactory	some shortcomings	serious shortcomings
design	.....		
construction	.....		
maintenance	.....		

d) items necessary to repair taps and tapstands

e) comment

10. Schematic Situation Plan (building positions, altitude, pipe diameter, HDP/GI, north direction, orientation points e.g. chautara or trail, landslide area, etc.)

11. Political Factors

Describe problems of a political nature, either internal to the area served or between the project area and neighbouring settlements, which affect the functioning of the system.

12. Does vandalism affect the project:

D. MAINTENANCE ARRANGEMENTS

1. Village Maintenance Worker (VMW)
   - name: age:
   - education level:
   - resident or non-resident:
   - date he assumed maintenance responsibilities:
   - selected by:
   - nature of training:
   - length of training:
   - VMW's supervisor:

a) compensation: is the VMW paid for his work ?

   - if yes, at what rate (e.g. 10 kg rice/month):

b) VMW's self-evaluation of competence:

   - has confidence in his ability to cope with most maintenance problems:

- requires additional training or support in the following areas:

- knows how to secure required tools and materials:

- knows where to seek help with maintenance problems:

c) Reporter's evaluation of VMW's competence

- competent and knowledgeable:
- some shortcomings in competence and knowledge:
- serious shortcomings in competence and knowledge:

d) Reporter's evaluation to VMW's performance

- maintenance task performed regularly and thoroughly:
- maintenance task carried out irregularly and inadequately:
- maintenance task seldome or never carried out:

e) comment

2. Village contribution to maintenance programme

a) does the village contribute to support the VMW:
   - if yes, is the contribution voluntary or compulsory:
   - if yes, is the contribution in cash or kind:

b) does the village contribute to the purchase of maintenance supplies and materials:

c) which tools and materials were bought by the project themselves:

d) has a maintenance team been established in the village:

e) describe village arrangements for providing labour for maintenance and repair tasks:

f) is there any other maintenance arrangement in the village e.g. for mandir or school repair tasks:

   - if yes, how is it organized:

g) what kind of responsibility can be taken by the villagers:

h) comment

3. Availability of tools and materials

a) general assessment

- technician has sufficient tools and materials:
- VMW has incomplete supply of tools and materials:
- VMW has virtually no basic tools and materials:
- VMW has virtually no basic tools and materials:

b) where are the tools/materials kept:

4. General maintenance procedures:

a) reporting system: how are problems located:

- report of local inhabitants
- regular inspection by VMW, frequency:
- other

b) routine maintenance checklist (yes, frequency/no)

- is the spring/stream catchment periodically cleaned:
- are all various tanks periodically cleaned:
- are pipeline cleaning outs periodically opened:
- are air valves periodically regulated:
- are taps repaired when they break:
- are valves periodically checked and oiled:
- are leaks repaired.

5. Major maintenance experiences
Describe circumstances surrounding major damage to catchment, tanks, tapstands, pipeline, etc. of the scheme and repair or reconstruction work undertaken:

6. Causes of maintenance and damage problems

- design deficiencies:
- shortcoming in construction:
- natural disasters (flood, landslide, etc.)
- inadequate preventive maintenance:
- improper use (ignorance/negligence):
- malicious damage:
- other:

comment

7. General Project Status

- non-functioning:
- major flows:
- minor flows:
- near optimal:

E. ACTION RECOMMENDATIONS

1. Training needs.

2. Tools and materials need

3. Repair needs:

4. Dispute reconciliation needs:

5. Other.

F. TOOLS AND MATERIALS IN THE VILLAGE (give exact specifications)

1. Pipes:

2. Fittings:

3. Tools:

4. Other materials:

SPECIAL COMMENTS:

.....
(reporter's signature)

List of all 59 VMW Trainees, State June 1981

DHAULAGIRI ZONE

District	Project	Name of VMW	Course year
Baglung	Lekhani	Mani B'dr Khader	035
	Mulpani	Bharat Pd. Pandey	035
	Bhakunde Saure	Dal B'dr. Thapa	035
Mustang			
Myagdi	Baraha Paudur	Tek B'dr. Gabarja	035
	Kuhun	Krishna B'dr. Pun	035
	Doba (?)	Shammer B'dr. Pun	035
	Pakhapani	Ra. B'dr. Pun	037
Parbat	Ranja Tilhar	Tulsi Rimal	035
	Durlung	Lil B'dr. Gurung	035
	Durlung	Dhan Pd. Gurung	035
	Jhuli Pokhari(?)	Tanka Pd. Subedi	037
	Wahakithati Deurali + Taltum	Tulsi Pd. Neupane	038

GANDAKI ZONE

District	Project	Name of VMW	Course year
Gorkha	Palungtar	Suresh Nath Khadel	035
	Phinam	Surendra B'dr. Baniya	035
	Hansapur	Jhan Nath Adhikari	035
	Gaikhur	Rudra Pd. Malla	035

District	Project	Name of VMW	Course year
Kaski	Sildujure Taprang, W No. 2	Kul Pd. Baral	035
	Sunpani Kalika	Surya Nath Adhikari	035
	Shurdibesi Kalika	Ram B'dr. Thapa	035
	Kahu Bhalam	Chinta Mani Sharma	035
	Jhajermare Kalika	Nandikeshar Tripathi	035
	Lawang Ghalel	Mrigh Singh Gurung	035
	Parche W. No. 7	Man B'dr. Gurung	035
	Arwa Bijaya	Hom Nath Baral	035
	Hemja	Tirth Nath Bastaula	037
	Pumdi Bhumdi	Khada Nanda Baral	037
	Dhikar Pokhri; Naudanda Serachaur	Mohan Pd. Paudel	037
Kaski	Begnas, Sundari Danda	Bishnu K. Tiwari	037
	Bhadaura Tamagi	Man B'dr.	037
	Kalika, Jhajermare	Som Nath Adhikari	038
	Arwa 8,9 Kalika	Prasad Gurung	038
	Arwa Bijaya	Dhundi Raj Baral	038
	Lahachowk	Som Lal Ranabhat	038
	Kristi Nachne Chaur	Ganesh Sharma	038
Lamjung	Chitti Tilhar	Santa B'dr. Gharti	035
	Thulibesi	Makkhan B'dr Adhikari	037
Syangja	Gurungkha	Khim B'dr Gurung	035
	Bichari Chautara	Ram Pd. Paudel	035
	Nagdanda	Resham Lal Upadhaya	038
	Gurungkha	Khadga Singh Gurung	038
	Malunga	Jhaman Singh Thapa-magar	038
	Armadi Sirubare	Ganga Dhar Regmi	038

District	Project	Name of VMW	Course year
Tanahun	Khairenitar	Som Lal Rimal	035
	Khairenitar (Udendhaga)	Man B'dr. Karki	035
	Shyangha Hatiya	Surya K. Shrestha	035
	Chang (Jharpa)	Krishna Kr. Shrestha	035
	Bandipur	Min B'dr. Ale	035

LUMBINI ZONE

District	Project	Name of VMW	Course year
Gulmi	Bharse	Nar B'dr.Budhathoki	035
	Janiya	Khim Lal Bhandari	035
	Janiya	Narendra Pd. Thapa	038
Arghakhachi	Dhikura	Gopal Pokhrel	035
Nawalparasi			
Palpa	Phek De Dhobhan	Bharat Pd. Paudel	035
	Gadakag	Tilak Ram Thapa	035
	Somadi	Guru Datt Sharma	035
	Gadakot	Krishna B'dr. Biswakarma	035
	Madan Pokhra	Shiv B'dr. Baral	038
	Rupse	Tanka Nath Acharya	038
	Phekde dhobhan	Dhan B'dr. Ranamagar	038

VMW Training Course 2038 Schedule

FR	Opening Ceremony	
1st Week		
SU	7 - 11 a.m.	Course introduction, official procedure Introduction of pipe, fittings and tools.
	2 - 5 p.m.	Practical lesson on HDP pipe
MO	7 - 11 a.m.	HDP pipe Introduction of fittings and tools Importance of maintenance
	2 - 5 p.m.	Practical lesson on HDP pipe
TU	7 - 11 a.m.	HDP fittings PVC pipe PVC-HDP special joints Importance of maintenance
	2 - 5 p.m.	Practical lesson on special joints
WE	7 - 11 a.m.	HDP fittings PVC pipe and fittings PVC - HDP - GI special joints
	2 - 5 p.m.	Practical lesson on HDP fittings and special joints.
TH	7 - 11 a.m.	Examination on HDP pipe and fittings Examination on PVC pipe and fittings PVC - HDP - GI special joints
	2 - 5 p.m.	Practical lesson on HDP fittings
FR	7 - 11 a.m.	Revision on HDP and PVC Examination on PVC - HDP - GI special joints
	2 - 5 p.m.	Practical lesson revision
SA		FREE

2nd Week

SU	7 - 11 a.m.	Social aspects of village level maintenance GI pipe Operation of valves
	2 - 5 p.m.	Practical lesson on valves
MO	7 - 11 a.m.	Social aspects of village level maintenance GI pipe and fittings Operation of valves
	2 - 5 p.m.	Practical lesson on valves
TU	7 - 11 a.m.	Social aspects of village level maintenance GI pipe and fittings Examination on valves Water supply pipe line
	2 - 5 p.m.	Practical lesson on GI pipe
WE	7 - 11 a.m.	Case study on village level maintenance GI pipe and fittings Examination on valves Water supply pipe line
	2 - 5 p.m.	Practical lesson on GI pipe and fittings
TH	7 - 11 a.m.	Importance of water Examination on GI pipe and fittings Water supply pipe line
	2 - 5 p.m.	Practical lesson on GI pipe and fittings
FR	7 - 11 a.m.	Examination on water supply pipe line Revision on GI pipe and fittings Plumbing
	2 - 5 p.m.	Practical lesson on GI pipe and fittings
SA		FREE

3rd Week

SU	7 - 11 a.m.	Source, spring/stream catchment Water supply pipe line general guidance
	2 - 5 p.m.	Practical lesson revision
MO	7 - 11 a.m.	Spring/stream catchment Water supply pipe line general guidance
	2 - 5 p.m.	Practical lesson revision
TU	7 - 11 a.m.	Reservoir Tank Break Pressure Tank (BPT) Introduction of Sanitation How to build a pit latrine
	2 - 5 p.m.	Construction of a pit latrine on site
WE	7 - 11 a.m.	Tapstand Introduction of Sanitation Introduction of maintenance check list
	2 - 5 p.m.	Construction of a pit latrine on site
TH	7 - 11 a.m.	Examination on Water supply system Introduction of maintenance check list
	2 - 5 p.m.	Construction of a pit latrine on site
FR	7 - 11 a.m.	Examination on maintenance check list General revision
	2 - 5 p.m.	Construction of a pit latrine on site
SA		FREE

Teachers during the first three weeks:

Lekh B. Gurung (RD)

G.S. Pun (RD)

Wagle (PDTC)

M.B. Pun (PDTC)

Course supervision

W. Schramm (RD)

4th Week

SU to TH : Repair of a special selected water supply system in small groups

FR : Use of maintenance check list

Closing ceremony

Instructor on project site:

Lekh B. Gurung (RD)

G.S. Pun (RD)

Kedar Baral (RD)

Supervision of repair maintenance:

Krishna Sigdel (RD)

Official Letter Regarding Maintenance Policy, from Ministry

HMG, Ministry of Local Development
Western Development Regional Directorate
Pokhara

037.11.27

Local Development Ministry
Regional Directorate

The rural water supply system made under assistance of Local Development Ministry was supposed to be maintained by the villagers themselves. But due to different reasons the system are somehow affected and not functioning well. So it has been realised that there should be a maintenance programme to keep the system running. In order to do so the following policy has been approved on 037/11/27 and it is requested to implement the policy accordingly.

1. If projects to be maintain cost Rs 5000 it should be maintained with village contribution only in term of money or labour. But the fittings which are needed but not available in the market that could be provided by the regional directorate.

2. If a project to be maintained needs more than Rs 5000 then a technical person from the regional office will be sent to make the detail survey cost estimate of the project.

3. The estimate presented by the technical person has to be approved by the Regional Director.

4. After approval the requested material has to be purchased through account office under the maintenance budget head-line and the material has to be transported to the site.

5. The transport cost will be paid according to the CWS portering regulation.

6. The technician assigned to maintain that project should be provided the money what he needs for porter, labour etc. in advance.
That technician has to submit all bills of the expenses and the voucher of handovering the materials, to the regional office in order to get clearance of advance from the account office.
But the payment of the labourers in the village has to be done in presence of Water Committee Chairman or Pradhan Panch or any member of the Water Committee.

7. The report of maintenance of the project has to be given time to time to the regional director and Central Office.

Proposal for Altered Jhapa Conference Outputs regarding maintenance

See Annex A7 of Jhapa Conference Outputs

Detailed Survey Procedure in addition to point 4

4. The Survey Team should present an official project introduction letter to local leaders for discussion during final public meeting.

See Annex A8 of Jhapa Conference outputs

Detailed Survey: Procedure for conducting first public meeting in addition, after point 5.

The Survey Team should hand out several copies of an official introduction letter to local leaders explaining main official procedures, how to start the project, expected village contribution and after completion their maintenance responsibilities. The discussion should take place in the final public meeting.

See Annex A9 of Jhapa Conference Outputs

Detailed Survey: Procedure for conducting final public meeting.

Remark: That official introduction letter should cover at least point 4,5,6 an 10. If such an important discussion goes along with a presented official paper it might create more awarness on every point and nothing might be forgotten before the project agreement will be signed.

See Annex A10 of Jhapa Conference Outputs

Project Engineer, job description for construction phase

5. project completion
regarding 5.2:

Project supervisor should do a pre-inspection that it is for sure the Project Engineer will sign the project completion certificate. Because of village maintenance agreement and somehow handing over to the Maintenance Section instead of Project Supervisor, the Maintenance Supervisor should be in company with Project Engineer and sign as well the project completion certificate.

5.6 He shall ensure that the Water Supply and Sanitation Committee with Village Maintenance Worker and Village Maintenance agreement.

See Annex All of Jhapa Conference Outputs

Overseer/Supervisor, job description for construction phase 4 Supervision, for addition

1. Right in the beginning of the construction phase he should select together with Water Supply and Sanitation Committee and WSST at least one Village Maintenance Worker who should be trained by WSST and recognized as WSST Assistant and paid at leas' as semi-skilled la our.

2. At final stage of the project he shall intensively explain the need of maintenance in at least four Water Supply and Sanitation Committee meetings and get signed the Village Maintenance Agreement before project completion.

3. After the project is totally completed he should inspect the project from top to bottom and ensure that if the Project Engineer will come for final inspection everything is 100% completed.

See Annex A12 of Jhapa Conference Outputs

Water Supply Technician, job description for construction phase.

Project construction

5.8 He shall train at least one Village Maintenance Worker right from construction beginning, who becomes his Assistant.

5.9 He shall train each tapstand caretaker in tap repair and tapstand maintenance.

5.10 He shall discuss and help to proceed the Village Maintenance Agreement as well as organise a maintenance programme within the Agreement framework.

5.11 He shall ensure that the Village Maintenance Worker has the appropriate set of tools and spare parts.

See Annex A14/I of Jhapa Conference Outputs

Village Panchayat, Water Supply Committee, PartI, Membership and Status

4. Village Maintenance Worker

4.1 The Village Maintenance Worker shall be selected from among the resident project villagers by mutual agreement between the Water Supply and Sanitation Committee and the Project technical staff.

4.2 The Village Maintenance Worker shall be additional full member of the committee but only during construction phase not after he has signed the Village Maintenance Agreement.

4.3 He shall work closely with the Water Supply and Sanitation Technician as his Assistant to learn the skills needed for operation and maintenance work.

4.4 The Committee and the Village Maintenance Worker shall agree on a reasonable rate of payment and the Village Maintenance Agreement shall be signed before construction is completed. Funds for payment must be raised by the Committee, either from the Village Panchayat or collected from the benefitting community.

In Addition to Jhapa Conference Outputs: Annex A14/IV

Village Panchayat, Water Supply Committee, Part IV Responsibility during Post Construction Phase

1. After the Project is completed all committee members are still in charge to take care of the project.

2. The Committee shall supervise job performance of the Village Maintenance Worker and raises funds for his salary according to Village Maintenance Agreement.

3. The Committee shall supervise all tapstand caretakers.

4. The Committee shall prevent vandalism and improper water use.

5. The Committee shall report immediately any breakdown which cannot be handled by Village Maintenance Worker to the Regional Directorate Maintenance Section.

Ministry of Panchayat and Local Development
Regional Directorate
Pokhara

Fiscal Year:

Village Project Agreement

1. Name of District
2. Name of Village Panchayat
3. Name of Project
4. Level of Project (village/town/district):
5. Location of Project (a) village/town
   (b) Ward No.
6. Population to benefit from the Project
7. Date of approval of Project by Village/Town Assembly:
8. Date of approval of Project by concerned Coordination Committee:
9. Date of approval of Project by District Assembly:
10. Date of commencement of Project:
11. Date of completion of the Project:
12. Total estimated cost of Project:
13. Description of expenditure:
14. Expenditure to be borne by Village Panchayat in case of Village Level Project by Town Panchayat in case of Town Level Projects and by District Panchayat in case of District Level Projects:
15. Assistance to be provided by District Panchayat out of its own resources:
16. Description of assistance from other sources except HMG:
17. Assistance to be given by HMG:
18. On behalf of our project area/District Panchayat we agree to abide by the following conditions:

    a. We undertake to complete the project according to its cost estimate within the time stipulated in this Agreement.

b. We undertake to contribute on behalf of the Project Area labour and other materials in the quality shown in Clause 14 above in kind or in cash and also undertake to appropriate to the project all the assistance to be received under clauses 15, 16 and 17.

c. If additional assistance not foreseen under clause 16 above were to be available from any other source at a future date, we undertake to inform the District Panchayat of the same in time.

d. We undertake to make the proper use of all assistance received for the project and to submit in time to the District Panchayat a statement of accounts to that effect in a manner to be prescribed it.

e. A progress report on the project will be submitted to the District Panchayat every month until the completion of the Project.

f. Just before completion of the project the Water Supply and Sanitation Committee together with the appointed Village Maintenance Worker (s) will sign the Village Maintenance Agreement, along with the Village Panchayat Secretary.
The Village Maintenance Agreement points out the responsibilities on village level, regular and repair maintenance and fixes a reasonable salary in kind or in cash for the Village Maintenance Worker to be paid by the benefitting community.

g. This Agreement only terminates after the Village Maintenance Agreement and the Project Completion Certificate has been signed by MPLD-RD Project Engineer, Maintenance Supervisor and Water Committee Chairman.

h. In case of village level projects the final certification will be done by the technician of the Public Works Section or any authorised person according to LDO direction.

.....	.....	.....
Water Supply & Sanitation Committee, Chairman	Village Panchayat Secretary	LDO

Ministry of Panchayat and Local Development
Regional Directorate
Pokhara

Village Maintenance Agreement

Name of Project, ward No.:

Name of Village Panchayat:

Name of District:

Name of all Water Committee Members:

Name of (all) VMW(s):

According to the Village Agreement this Village Maintenance Agreement has to be undertaken. This agreement has to be discussed first very seriously with the project villages. Water Supply and Sanitation Committee as representative of the people in the project area and the above mentioned VMW(s) agree on the following, which is also approved by Village Panchayat Secretary.

1. The above mentioned VMW(s) is (are) officially appointed by the CWSS project to perform regularly village level maintenance under supervision of the Water Committee.

2. After the Project Completion Certificate is signed VMW has to fulfill thoroughly the following tasks.

   a. He is responsible for project operation

   b. He has to perform routine maintenance according to the maintenance checklist

   c. He has to do minor repair

3. If the VMW is not able himself or he needs certain materials to perform repair work he shall ask RK-Maintenance Section for technical assistance by a letter from Water Committee Chairman or his representative.

4. VMW keeps and looks after maintenance tools and spare parts (list with Village Panchayat Secretary and RD Maintenance Section). He is fully responsible for them. If tools are missing action will be taken.

5. VMW works together with appointed tapstand caretakers.

6. Project village provides voluntary labour for repair maintenance.

7. Replacement of brasstaps is possible but only once on RD's expense, then the project village has to pay for them if they are broken.

8. Water Committee representing the project villagers and the VMW(s) agree on ..... kind/cash salary a month/ year after discussion and mutual agreement with the project villages, the salary will be submitted on .....

9. Water Committee has to collect the salary for VMW in time.

10. If there are more than one VMW, their responsibility is divided as follows:

    responsible for maintenance tools and spare parts:

    Mr. .....

    who is responsible for which area:.....

    .....

11. The signatories are aware of possible action by District authorities if this agreement is not fulfilled.

.....	.....	.....
Village Panchayat Secretary	1st. Village Maintenance Worker	Chairman Water Supply & Sanitation Committee

.....
2nd Village Maintenance Worker

.....
3rd Village Maintenance Worker

copy to: MPLD-RD Maintenance Section
LDO
Village Panchayat
Water Supply and Sanitation Committee
each Village Maintenance Worker.

CWS Project Maintenance Check List

1. SOURCE

Spring:

a) spring channel:

- are there any leaks ?
- is there a block due to roots?
- do sand and pebbles cause blocks ?

b) infiltration pipe:

- is the infiltration pipe working ?
- how is the water quality ?

c) inlet hole

- is the inlet hole clean ?

d) outlet

- is there any strainer or skreen ?
- is the outlet blocked ?
- is the strainer corroded ?
- should the strainer be changed ?

e) cleaning out

- is the cleaning out working ?

f) overflow

- is the **overflow** working ?

g) spring area

- is the spring structure well protected ?
- are there sufficient trees planted around the spring ?
- is there any flood damage ?
- is there any landslide ?
- how to prevent flood damage and landslides ?

Stream:

a) dam

- are ther any leaks ?
- is the dam effected by flood?
- is the spill way properly fitted ?
- is the spill way clean ?

b) Infiltration pipe

- is the infiltration pipe working ?
- how is the water quality ?

c) Filter box (if any)

- is the filter working ?
- is it blocked ?
- is it corroded ?
- is it damaged ?

d) strainer

- is the strainer working ?
- is it blocked ?
- is it corroded ?
- is it damaged ?

e) inlet hole

- is the inlet hole blocked ?
- is there any damage on iron bars and grating ?

f) outlet

- is the outlet blocked ?
- is the outlet pipe working ?

g) cleaning out

- is the cleaning out working ?

h) intake chamber

- are there any leaks ?
- is the intake contaminated by clay, sand, etc. ?
- did you clean the intake chamber?

h) spring structure

- are there any leaks ?
- is the spring intake basin contaminated by clay, sand, etc.?
- did you clean the intake basin ?

i) Valves

- did you operate all valves ?
- are valves corroded or jammed ?
- have you oiled them ?
- is any valve leaking ?

j) anything else ?

i) valves

- are all valves well working?
- did you operate all valves?
- are valves corroded or jammed?
- have you oiled them ?
- is any valve leaking ?

j) stream area

- is the structure well protected
- is the stream safe from contamination like excreta, waste, etc.?
- is there any flood damage ?
- is there any flood damage ?
- is there any landslide ?
- have you cleaned the stream bed ?
- are there sufficient trees around the stream ?

k) anything else ?

2. CHAMBER FOR VALVE AND TAP CONNECTIONS

- are the walls in order ?
- are all valve chambers well covered ?
- is any cover damaged ?
- are the valve surroundings clean ?
- do leaks occur in the valve chamber ?
- does surface water effect the chamber ?
- is there any landslide ?
- anything else ?

3. AIR VALVE

- is the air valve working ?
- did you operate the handle ?
- did you oil the handle bolt ?
- is the handle in the right position ?
- is there any leak ?

4.1 BREAKPRESSURE TANK, INTERRUPTION CHAMBER

a) Structure: - is there any structure damage ?
- are the man holes well covered ?
- is any defect occured to the basin ?
- does the surface water effect the structure ?
- is there any landslide ?

b) inlet: - is the inlet pipe blocked ?
- is the ball valve working well ?
- is anything broken ?
- are ball barrel and cap clean ?

c) baffel: - is the baffel properly fitted ?
- does it work well ?

d) outlet: - is the outlet blocked ?
- is a wiremesh strainer needed ?
- is there any leak ?

e) cleaning out: - is the basin contaminated by clay, sand, etc.?
- did you operate the cleaning out ?

f) overflow: - is the overflow in the right position ?
- is the overflow in good repair ?

g) inspection chamber/operation chamber:

- did you clean the chamber ?
- is there any leak ?

h) valves: - are all valves working well ?
- did you operate all valves ?
- are they corroded or jammed ?
- have you oiled them ?
- is any valve leaking ?
- are there any other defects ?

4.2 PRESSURE REDUCING PIPE/VALVE

- is the pressure reducing pipe/valve well working?
- are there any leaks ?
- are there any other defects ?

5. CLEANING OUT OR WASHOUT VALVES

- do you clean the pipeline regularly by opening the cleaning out ?
- Are all valves well working ?
- is any valve leaking ?
- are there other defects ?

6. STORAGE TANK OR RESERVOIR TANK

a) basin:
- is the basin contaminated by clay, sand, etc.?
- have you cleaned the tank by operating the valves ?

1st : open the cleaning out and close the outlet

2nd : open the lower valve of the inlet and close the upper valve of the inlet.

3rd : clean the tank basin

4th : open the upper inlet valve, close the lower inlet valve and continue cleaning

5th : close the cleaning out and open the outlet.

- are there any animals/insects in reservoir tank ?
- are there any leaks ?
- is there any basic repair necessary ?

b) inlet:
- are there any leaks ?
- are there any other short comings ?

c) outlet:
- is there a wiremesh strainer fitted on the outlet pipe ?
- is there a block ?
- are there any leaks ?
- are there any other short comings ?

d) overflow:
- is the overflow in good repair and functioning ?

e) cleaning out:
- is the cleaning out well working ?
- is there any block of the washout pipe ?
- are there any short comings ?

f) structure:
- is the tank well roofed ?
- is the man hole cover in good condition ?
- is the cover well closed ?
- are the ventilation skreens still in good repair ?
- are there any other shortcomings ?

g) inspection chamber
- is the inspection chamber clean ?
- did you operate all valves ?
- are the valves corroded or jammed ?
- did you oil them ?
- are there any valves leaking ?
- are there any other short comings ?

h) valves:
- did you operate all valves ?
- are the valves corroded or jammed ?
- did you oil them ?
- are there any valves leaking ?
- are there any other shortcomings ?

i) tank area:
- is the surrounding clean ?
- is surface water properly drained ?
- is the tank safe from landslides ?
- is there any tank protection ?

7. TAP STAND

a) structure:
- are the standpost or plate damaged ?
- is platform usually clean ?
- does the drain pipe work well ?
- are gagro placing steps broken ?
- are the walls free of grass or moss ?

b) brass tap:
- is the tap leaking ?
- if yes, have you changed the washer ?
- is the water flow sufficient ?
- are there complete new brass taps needed ?

c) tap connection chamber:
- is the chamber well covered ?
- are there any leaks ?
- is the stop cock working well ?
- did you control the water flow ?
- is anything needed for repair ?

d) tapstand area:
- is the surrounding clean ?
- does drain water effect the tapstand ?
- is the tapstand safe from landslide and other damage ?
- are there pipeline leaks/pipe cuts around the tapstand ?

8. PIPELINE

a) supply pipe-line :
- did you repair all pipe leaks, if any ?
- if necessary, did you prevent the pipeline from landslides ?
- is the pipe seen on ground ?

b) river crossing:
- are there leaks on GI pipe ?
- are there any leaks on flash sets or brass union joints ?
- is the pipe properly supported ?
- are the supports well founded on solid ground ?
- is the pipe well fixed on the supports ?

9. VALVE

a) operation:
- did you operate all valves ?
- did any valve jam ?
- have you oiled or greased valves ?
- have you cleaned valves of erosion and repainted them ?

b) maintenance:
- is any valve leaking ?
- does the valve close properly ?
- if the valve is open, does the water pass through ?
- are all fitting next to the valve well fixed ?

10. MATERIAL

Which materials are necessary for actual repair but not in the village ?

DETAIL INFORMATION OF PROJECT STATUS

District:

Project:
VMW:

Date	Check List No.	Summary
	1. Source:	
	2. Chamber:	
	3. Air valve	
	4.1 BPT/IC	
	4.2 Pressure reducing pipe/valve	
	5. Cleans out	
	6. Storage tank	
	7. Tapstand:	
	8. Pipeline:	
	9. Valve	
	10. Materials	

Alternative Checklist Form:

DETAIL INFORMATION OF PROJECT STATUS

District: Project:

VMW:

Date	Checklist No.	good repair	some short-coming	break down	Summary/Remarks
	1. a) b) c) d) e) f) g) h) i) j) k)				
	2.				
	3.				
	4. a) b) c) d) e) f) g) h)				
	4.2				
	5.				
	6. a) b) c) d) e) f) g) h) i)				

Date	Checklist No.	good repair	some short-coming	break down	Summary/Remarks
	7. a) b) c) d)				
	8. a) b)				
	9. a) b)				
	10. Materials:				

ANNEX 11

Ministry of Panchayat and Local Development
Regional Directorate
POKHARA

Project Completion Certificate

Name of Project, Ward No.:

Name of Village Panchayat:

Name of District:

Name of WSST:

Name of Project Supervisor:

Name of Project Engineer:

Name of all Water Committee Members:

Name of VMW(s):

Date of final inspection:

A. Brief Technical Description

1. Number of served households
2. Water source actual yield (during final inspection)
3. Type of system: open/closed
4. Length of system:
5. Number of several components:

   spring catchment:
   stream catchment:
   collection chamber:

main valve: , air valve: , cleaning out: ,
river crossing: , break pressure tank: ,
tapstands: ,

6. Special structure:

B. Maintenance Arrangement

The enclosed Village Maintenance Agreement has been signed and the project village is aware of its obligations. The list of maintenance tools under VMW's responsibility was handed out to the Village Panchayat Secretary, there is also a copy with RD Maintenance Section.

ANNEX 12

Maintenance Requests to RD Pokhara, State July 1981

No.	Letter date	District	Project Name
1.	037/12/10	Parbat	Ramja Tilhar
2.	038/1/4	Palpa	Rupse; Chidipani
3.	038/1/7	Parbat	Deupar
4.	037/12/14	Myagdi	Jyamruk Kot
5.	037/9/21	Kaski	Janjakot
6.	037/12/5	Kaski	Taprang
7.	037/12/2	Palpa	Gadakot
8.	037/8/12	Gorkha	Palungtar
9.	037/10/13	Kaski	Naudanda Serachaur
10.	037/9/3	Mustang	Lete
11.	037	Kaski	Jhajermare and Kalika
12.	037/12/27	Tanahan	Rupakot
13.	037/12/27	Lamjung	Chiti Tilhar
14.		Parbat	Durlung
15.		Syangja	Ghurungkha
16.	038/4/	Kaski	Chapakot W. 2,3,5,6

C. Project Completion

Project Engineer, Maintenance Supervisor and Water Committee Chairman have thoroughly inspected the whole project and all of them attest by their signature that the system is totally completed, nothing remains and the whole project is well functioning.

.....	.....	.....
Chairman Water Supply and Sanitation Committee	Maintenance Supervisor	Project Engineer

enclosure: Village Maintenance Agreement

Copy to :

Regional Directorate Pokhara
MPLD-RD Maintenance Section
LDO
Water Committee Chairman