REVIEW OF THE DEPARTMENT OF WATER SUPPLY AND SEWERAGE

Strategic Planning - Department of Water Supply and Sewerage

Asian Development Bank TA 1718

COWATER INTERNATIONAL
METCON CONSULTANTS
P. P. PRADHAN & Co.

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REPORT ON DWSS REVIEW

STRATEGIC PLANNING PROJECT FOR DWSS
ASIAN DEVELOPMENT BANK
TA 1718

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by

COWATER INTERNATIONAL
METCON CONSULTANTS
P. P. PRADHAN & Co.

Acronyms and Abbreviations

ADB	Asian Development Bank
ADB/N	Agricultural Development Bank of Nepal
AGO	Auditor General Office
CBO	Community Based Organisations
CHRDU	Central Human Resources Development Unit
CIDA	Canadian International Development Agency
CTA	Chief Technical Advisor
CWSS	Community Water Supply & Sanitation
DDC	District Development Committee
DE	District Engineer
DG	Director General
DOI	Department of Irrigation
DTO	District Treasury Office
DISVI	An Italian INGO
DWSO	District Water Supply Office as part of the DWSS
DWSS	Department of Water Supply and Sewerage
EEC	European Economic Community
ESAs	External Support Agencies
ESTAP	East Action Program
FACD	Foreign Aid & Coordination Division
FCGO	Financial Comptroller General Office
FINNIDA	Finish International Development Agency
FY	Fiscal Year
GDP	Gross Domestic Product
GTZ	German Technical Cooperation
HMG	His Majesty's Government of Nepal
IDA	International Development Association
INGO	International Non Government Organization
IRDP	Integrated Rural Development Project
JAKPAS	Janata Ko Khanepani Ra Sarsafai Karyakram
JICA	Japan International Cooperation Agency
K-Bird	Karnali Bheri Integrated Development Project
M&E	Monitoring and Evaluation
MEC	Ministry of Education and Culture
MHPP	Ministry of Housing and Physical Planning
MIS	Management Information System
MITS	Management Information & Technical Support Project
MLD	Ministry of Local Development
MOE	Ministry of Education
MOF	Ministry of Finance
MOH	Ministry of Health
NEWHA	Nepal Water for Health
NRCS	Nepal Red Cross Society
NGO	Non Government Organization
NPC	National Planning Commission

NRS	Nepalese Rupee
NWSC	Nepal Water Supply Corporation
O&M	Operation and Maintenance
ODA	Overseas Development Administration (United Kingdom)
PDA	Population Development Association, Thailand
PMC	Project Management Committee
PS	Private Sector
PSP	Public Standpost
RADC	Remote Area Development Committee
RD	Regional Directorate
RWSS	Rural Water Supply and Sanitation
SCF	Save the Children Fund
SDC	Swiss Development Cooperation
SNV	The Netherlands Development Cooperation
SO	Support Organisation
SRDP	Sector Review and Development Plan 1991-2000 (HMG, MHPP 1991)
SWC	Social Welfare Council
TA/DA	Travel Allowances/Daily Allowances
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United Stated Agency for International Development
VDC	Village Development Committee
CHV	Community Health Volunteer
VHW	Village Health Worker
VMW	Village Maintenance Worker
WHO	World Health Organization
WHW	Women Health Worker
WID	Women in Development
WSS	Water Supply and Sanitation
WUC	Water Users Committee

AUTHORS' NOTE

This document represents the third and fourth month's work of the DWSS/ADB Strategic Planning Team. It is the compilation of information collected from interviews with and documentation provided primarily by DWSS. It is prepared as an input to the DWSS Workshop to be held on 21 February. The authors gratefully acknowledge the time and interest freely given by those assisting them in collecting the information.

There are many opinions expressed in this document. They are in every way meant to be constructive and helpful. Ideas and concepts are put forward as to provide a basis for discussion. It is hoped that participants will provide criticism and comment at the workshop for further refinement of the ideas presented.

The Authors

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EXECUTIVE SUMMARY

By any measure, DWSS is a major HMG/N programme. It is responsible for 131 municipal or large town schemes, and (apart from those handed over to communities) for 782 smaller projects. Its budget is over one billion rupees. It has over 5000 employees in central, regional and district offices.

This strategic planning project is intended to assist DWSS plan its next seven years' work programme. To date, it has reviewed the overall sector and recommended DWSS roles within it. This report looks at DWSS itself, its past programmes, organization, systems and staff.

Nepal is changing and DWSS with it. For large organizations, change is difficult. DWSS is no exception. Nepal is now a multiparty democracy; its new decentralization policies are being put into practice. Centralized bureaucracies are being decentralized as local government (municipalities and District Development Councils) are being strengthened to take over many former central line agency functions. DWSS is searching for its new place and is attempting to change its role from being implementor to become a supporter of other organizations such as Water Users Committees, local bodies and NGOs carrying out implementation. This is a difficult change in direction, particularly when faced with donor driven coverage targets, a staff used to engineering and contracting and politicians demanding free water supply systems for their constituencies.

Faced with conflicting views on the quality of DWSS' work, and only anecdotal reports to go by, this project mounted a field survey of 45 schemes and their communities across the country. This was not a normal questionnaire survey. It undertook ethnographic study (usually taking over six hours and sleeping overnight) in the community to learn about the *history, process* and *functioning* of their schemes to draw comparisons between approaches and methods of implementation.

The sustainability of completed schemes is essential to DWSS' success. DWSS cannot afford to maintain all schemes indefinitely, so the policy is to hand them over to the community. The keys to having communities accept responsibility for maintenance need not have been demonstrated again in Nepal. But indeed, they were shown to be community ownership, the creation of strong users' committees and their meaningful involvement throughout the planning and implementation process.

Predictably, it was found that those communities which had been dealt with as partners, did not look on their schemes as free gifts from government and had made substantial contributions to their installation.... were maintaining their systems. Those schemes that had been built with bilateral assistance or by NGOs were more successful and sustainable than those without. Those built by DWSS-alone were frequently selected and built under political influence Consequently, DWSS had not been motivated to ensure the *proper* formation and *support* to community user committees (WUC's). Once again, the key to sustainability was demonstrated to be community management; and the key to community management: community ownership and meaningful roles taken by the community throughout the process.

Hygiene education and sanitation promotion has failed to have any significant impact in past programmes. New attempts are showing some promise but the several agencies making them are not coordinating efforts and pilot projects are going their own way without learning from one another. New budgets are being made available and ambitious plans are made for rapid acceleration but using methodology which is vague and unproven.

Community based programming is not new to DWSS. For over six years it has been directly involved in implementing its own CWSS projects, but lessons are still to be put into practice. For example, contractors are still being widely used (including in current ADBIII projects) and the complex process of providing support to the community is still being rushed through in target driven programmes. Some of the forces behind this are external (targets, political pressure and donor funding), others are internal such as the fact that DWSS staff is entirely engineering/technical most of whom undervalue or do not understand the essential need and nature of community management to achieve sustainability. But, DWSS is attempting change, and change is evident. FINNIDA, UNICEF and HELVETAS are each supporting successful programmes. ADBIII is attempting to bring community management into the mainstream, but its resources to do so are spread too thinly. Change is bound to be slow and difficult..... an overlay of training in community liaison will not suffice.

Some of the principal conclusions and recommendations are:

- that DWSS must give first priority to the backlog of over 900 schemes which it must *effectively* transfer to the community for operation, maintenance and ownership. A new Handover Unit is proposed to drive this programme. The first task must be handover of the large and expensive schemes. However, the municipalities and user groups assuming ownership will require extensive training and technical support.... and most of the schemes need rehabilitation before handover.

- that DWSS should conform to the Eighth Plan and withdraw from implementing small schemes serving less than 500 population. Likewise it should withdraw from implementing shallow well handpump schemes and support the private sector, NGOs and local government do the work.

- that "coverage" be reassessed based on district level surveys and planning by DDC supported by DWSS' district offices and the CHRDU. Also, that coverage include the private sector. This will have an important bearing on coverage estimated in the Terai, as the private sector has been very active in supporting sector development there over the past five years. Support to households wanting to buy their own handpump by providing credit is proposed as a pilot project.

- good information is essential for good management. Yet, the management information system lacks complete and reliable information on what is happening in the districts. Recommendations are made for a review of the MIS and reporting systems and their resuscitation.

- that the several agencies attempting new methodology in hygiene education and sanitation promotion be better coordinated, and lessons learned from the field be consolidated and applied to the on-going national programme. This could start with a bringing together of the projects/agencies in workshop format.

- the budget and project selection process is not transparent, does not use rational development-based criteria and is not based on local resource-based planning. A pilot project is proposed to establish a new procedure, still within the formal budgeting process, which will be more rational, transparent and enable community management such as the present project selection procedures do not.

- that DWSS should recognize the crucial need for multi-disciplinary skills for community based programming and bring in these skills into all levels of the organization from senior management at the centre to extension workers in the field.

These are some of our conclusions and recommendations thus far. They are presented herein as a basis of discussion at the forthcoming Steering Committee meeting and to assist in reaching firm conclusions on the way forward, conclusions which will be needed in the next phase of this project.

1. REVIEW OF EXISTING INVESTMENT PLANS

1.1 Coverage

Coverage is not well defined. Coverage used in Sector Review and Development Plan used design populations for DWSS schemes. (Coverage for schemes built after 1991 used design populations adjusted by a factor of 0.67) FINNIDA uses a " service level " definition to provide a more refined analysis of water supply coverage. The "Standards" published in 1993 provide design criteria which are useful in suggesting a coverage definition. These are :

- maximum desirable walking distance from water point: 50 meters vertical or 150 meters horizontal
- per capita demand: 45 l/cd which includes leakage and wastage
- maximum number of standposts users: 100 per standposts
- hours of service: 24 hours continuous as far as possible

Using the above as a practical guide, the following criteria for coverage is recommended

- 50 meters vertical or 150 meters horizontal walking distance for water point
- 25 l/cd availability of water
- 100 persons/standpost (including children) maximum
- 8 hours service/day, 12 months/year

Appendix A presents details of coverage calculations. Any future plan needs a strong baseline on which to base future projections. Thus it was important for this project to establish a good baseline of coverage. On reviewing previous coverage calculations certain anomalies began to appear. It then became essential to review the methods and assumptions on which the official figures were based. This was done with the following conclusions.

- the definition of coverage has varied over the years, there is no accepted definition of coverage. It is clearly stated in the "Standards",
- the Sector Review and Development Plan (1990), on which official estimates and targets are now based, presented coverage figures but provided no detailed basis for its calculation. It is known however, that it omitted private sector, some NGO and all DDC coverage. Private sector coverage, in particular, is substantial, especially in the Terai where private sector handpumps are widely used providing 24 hour service of high quality water,

- the Sector Review figures of rural coverage was based on the design population figures for recently built schemes whereas for urban estimates actual served populations were estimated,

- no account is made for malfunctioning schemes in the DWSS database,

- the DWSS database coverage estimates continue to omit private sector and DDC contributions and those of NGOs which are not working with DWSS,

- the most reliable estimates of coverage are to be found in the DWSS/FINNIDA data base resulting from its detailed field survey of six Lumbini Zone districts.

- comparison between the FINNIDA and DWSS coverage database reveals large discrepancies, the latter indicating underestimation. This is due largely to the omission of the contribution of the private sector.

- new estimates were prepared by this project in an attempt to rationalize the coverage discrepancies. Private sector and the non-DWSS associated NGOs were estimated and included. Allowance was made for non-functioning schemes and estimates were made for the contribution of DDC schemes. Overall coverage of 53.22% was estimated which is 9.22% higher than the official estimate of 44%

- apart from the implications the above has for sector planning, one conclusion is firm: field surveys are urgently needed across Nepal. Reliable baseline information is essential for sector planning. It is not yet available in Nepal. This has implications for this project as well as national planners monitoring progress by coverage data.

- under all assumptions, the private sector is very active and must be included in future surveys for coverage. Its strength demands attention It is a considerable resource which could be further strengthened with minor input from government.

Recommendations are that:

- a programme for field surveys be drawn up which integrates DWSS needs with those of district planning by the DDCs; also that the DDCs and VDCs be the prime movers in the surveys and that their staff be trained by DWSS using the field survey personnel, expertise, experience and staff developed by DWSS/FINNIDA.

- that DWSS undertake an exercise of estimating coverage rates to reveal further anomalies in its coverage database and upgrade its coverage estimates. It is important however that any estimation programme involving fieldwork should be integrated with local government as suggested above.

- taking the above comments and conclusions into account, DWSS should reach consensus on an acceptable definition of coverage.

1.2 Current and Proposed Investment Plans for Water Supply

The Sector Review and Development Plan (SRDP)

In April 1991, the MHPP completed a Drinking Water and Sanitation Sector Review and Development Plan 1991 - 2000 (the Sector Plan). It reviewed the past achievements of the sector and provided recommendations on approaches and targets. The following table gives the target and investment requirements.

Table 1.2.1 Sector Review and Plan (1991) Targets

Sector	1990	1995	2000
Total Pop (million)	18 940	21 188	23 256
Coverage (million)	6 940	11 166	17 879
Coverage % of pop.	37	53	77
Investment (NRs Million)		1945.7	4906 8

The Sector Plan recommends for the first five years (1991-1995) an extensive rehabilitation program which will safeguard infrastructure and the validity of 1990 coverage figures For this, an estimated NRs. 3748 million investment would be required. The plan suggests a further amount of NRs. 6793.4 million for rehabilitation during 1996-2000. The basis for such a large investment estimate was not stated

It is suggested that targets would be met by the following programs

Table 1.2.2 Capital Investment Program (Sector Plan, 1991)

	Benefitted Population (million)	
Program	1995	2000
Rural		
Piped	1 050	1.261
Deep Tubewell	0 697	0 805
Spring Protection	0 450	0.874
Shallow Tubewell	1.500	2.860
Total	3 697	5 800
Urban	0 520	0 913
Grand Total	4 217	6 713

While calculating investment, the Sector Plan has used the following per capita unit costs at 1990 prices.

Table 1.2.3 Unit per Capita Costs (Sector Plan, 1991)

Urban Piped Systems	NRs/Cap
- Large	4500
- medium	2000
Rural Gravity flow	
- Gravity flow	1000
- Deep tubewell	600
- Shallow tubewell	100
- Spring protection	150

Eighth Plan

The Eighth Plan (1992-1997) target is the provision of drinking water facilities to 72 percent of the population by 1997. It assumed that 7.8 million people (42%) of the total population of 18.8 million had water supply facilities in 1992. By 1997, the total national population was estimated to grow to 20.8 million. During the plan period an additional 7.2 million people would be provided water supply services. Of the 7.2 million, 6.76 million people would therefore have to be in rural areas and 0.44 million would be in urban areas.

In the rural areas the target would be met according to the following.

Table 1.2.4 Eighth Plan Investment Program

Program	No. of Systems	Benefitted Pop. (in million)	Development Budget (Rs. Million)	Per System Population	Per Capita Cost NRs.
Tubewell	60,559	4.057	334 6	66	82
Spring Protection	8000	0.268	72	34	268
On-going piped Sub-projects	500	1 404	1342 2	2800	958
New piped Sub-projects	NA	1.027	924.9	NA	897
		6 756	2673 7		

In Kathmandu valley an additional 83,000 people would be provided drinking water facilities 360,000 people would benefit in the other 28 towns by the extension and renovation of water supply systems. A total of Rs. 1780 million was to be allocated for urban water supply facilities.

The Eighth plan suggests that the overall target should be to provide water for all within the next 10 years. The plan also states that as a policy of handing over all the completed rural water supply projects to users' committees, about 240 piped water supply projects should be repaired and handed over during the plan period.

Compilation of DWSS and NGOs Plans

The DWSS prepares an annual plan before each fiscal year. The budget ceiling is provided by the Ministry of Finance. Of the total development budget ceiling, DWSS first allocates matching amounts for bilateral and multilateral programs. The remaining amount is allocated to its own schemes.

In the current fiscal year (93-94), the development budget of DWSS for those water supply projects (with no external support) is NRs. 190 million. The number of on-going projects in this year is 545 Therefore, on the average Rs. 3,50,000 has been allocated in each DWSS project this year. In four years the total investment will be around NRs. 880 million with a 10% increase per year.

During the 1992-96 period, the UNICEF/DWSS program is to concentrate in 33 districts of the Eastern and Central Development Regions. From this program about 2.5 million people would receive water supply facilities The investment requirement is NRs 857 million This target would be met by the following.

Table 1.2.6 UNICEF/DWSS Plan (1992-96)

Program	No. of Systems	Pop. Per Unit System	Benefitted Population	Investment requirement (NRs million)	Per Capita Cost
Gravity Systems	285	1000	285,000	353	1240
Spring protected	6409	50	313,000	67	215
Shallow tubewell	13,580	130	1765,400	306	175
Deep Tubewell	824	200	165,000	131	800

The ADBIII program would provide water supply facilities to 0.9 million population within four years. This target would be met by constructing 180 new gravity, 60 rehabilitation projects, 5000 shallow tubewells and 120 spring protections. The program is concentrated in 40 districts of Eastern, Mid-Western and Far Western Development regions. The allocated investment is NRs. 936 million. With this investment, the number of schemes will be many more since the identified scheme sizes are smaller. However, the benefitted population would remain around 0.9 million

Since 1990, FINNIDA assisted RWSSP was initiated in Lumbini zone It was estimated that 225,000 would be benefitted from the program by 1990. The revised program supposed to complete 2000 tubewells, 10 rehabilitation and 200 new gravity schemes . However, it is very likely that 175,000 population would be benefitted from 2000 tubewells, 10 rehabilitation and 125 new gravity schemes. The second phase plan has yet to be prepared which is expected to begin from Jan. 1995

The fifth funding agreement of DWSS with HELVETAS cover a three year (1992-94) period. During this period, the total investment would be NRs. 66 million. The target is to complete 26 gravity schemes and 45 major repairs of completed schemes. It is very likely that HELVETAS program will be passed out at the end of 1994. However, a complementary approach is being tested which is more oriented : ... rds self-reliance.

NGOs Plan in 1994

The following table describes the compilation of major NGOs plan of the year 1994. 2,65,000 population would be benefitted by these NGOs in the next year. The list does not include other smaller NGOs active in water supply sector such as Gorkha army, Kadoori foundation, Plan International, Indian army etc

Table 1.2.7 NGO Contribution to Sector Coverage

NGO	Benefitted Pop.	Programs	No. of units	Cost (NRs. million)
UMN	9700	Gravity	47	13 2
Lutheran World Service	4800	Gravity	NA	9 0
Lutheran World Service	3500	Tubewells	NA	4 4
DISVI	27500	Tubewells	750	NA
Action-Aid	2500	Gravity	32	3 3
CARE Nepal	17300	Gravity	37	NA
CARE Nepal	17100	Tubewells	38	NA
Tamakoshi	6000	Gravity	25	2 7
SAPPROS Foundation	8900	Gravity	13	4 0
Red Barna	2400	Gravity	15	0 9
NRCS	42500	Tubewells	800	2 0
NRCS	26800	Gravity	109	NA
NEWAH	28,400	Gravity	37	NA
NEWAH	67,600	Tubewell/Dugwell	660	NA

Plan to Reality

Both the Sector Plan and the Eighth Plan are ambitious in setting targets but do not provide assurances that funds will be available. The target set by Eight... Plan to cover water supplies facilities to all within the next 10 years is less realistic than the SRDP target of 77% by 2000

The Eighth Plan's target is 72% by 1997. Both plans are based on the DWSS coverage figures which do not include private sector coverage. (Refer Section 1). Its investment requirements NRs. 2674 million to provide facilities for 6.7 million people is substantially lower than the SRDP NRs 4906 million for 6.94 million people.

The Eighth Plan provides at least some guidance on which is to achieve the targets. 60% of targets are to be achieved through NGOs and the private sector. All schemes are to involve community participation at all stages of the project cycle. Government will not be directly involved in implementing gravity schemes with less than 500 population and all handpump schemes in the Terai.

The principal conclusion is drawn that although the plans are clear in setting targets, there is little information about baseline coverage, sources of funds and who will be responsible for meeting the targets, and how?

Unfortunately, neither the sector plan nor the Eighth Plan take into account the very active private sector in the Terai. Based on our field review at least 45% of the population in Terai are already served by handpumps through the private sector

Plans versus Targets

A rough estimation of coverage being achieved through current programmes indicates that the following population is gaining services through DWSS: 0.2m, UNICEF 0.5m, ADBIII. 0 25 and NGOs: 0.3m totalling 1.25 million/year. The eighth plan calls for 6.7m rural population in 5 years or 1.3 m/year. Thus, as for as the rural population is concerned this "back of envelope" estimate suggests that the targets are with range.

However, there are two factors which have an overbearing effect on whether the targets are realistic.

1) the targets of UNICEF and to some extent ADBIII and NGOs include the Terai population which is to a major extent already provided private sector coverage. Providing coverage to already covered populations will not help in meeting targets. The attraction to the Terai is its low unit cost/person covered through shallow handpumps.

2) lack of recognition of coverage by the private sector in the Terai resulting in underestimation of coverage. This is discussed in Section 1.1 which indicates an underestimate of coverage of 9% (1993). If so, this would have a very significant impact on chances of achieving the Eighth Plan target of 72% by 1997. It would also strongly suggest reorientation of UNICEF and other (including ADBIII) shallow handpumps programmes in the Terai.

1.3 Current and Proposed Plans for Hygiene Education and Sanitation

It is well known that provision of safe drinking water alone will has limited impact on improving health status. Proper disposal of excreta and improved hygienic practices are essential to achieve maximum results. Thus far, very limited financial and human resources

have been allocated to improve personal and environmental sanitary conditions in the country Sanitation and hygiene education are difficult and not essential in the eyes of community, politicians and planners Therefore, they are relegated low status and resources. To improve the situation, the HMG has set new targets for the current decade; the proposed target to be achieved by year 2000 is 25% and 75% respectively for rural and urban areas [1].

The Eight Plan (1992-97) has outlined policies to achieve the above stated targets It emphasises the involvement of women; uniformity in implementation approaches of the sector agencies, and involvement of NGOs and private sector. It also recommends provision of 50% subsidy for construction of sub-structure of latrines in the rural areas The sanitation targets to be achieved during the plan period are illustrated in Table 1.3.1.

Table 1.3.1 Eighth Plan Sanitation Targets (Pop in millions)[2]

	Beneficiaries	%
Urban	1 01	48
Rural	1.67	9
Total	2 73	13

A total of NRs. 6,2730 lakh was recommended for improved water supply projects of which NRs. 6236 lakh (about 10%) were suggested for sanitation activities. It is stated that about 54% of the of the target in the sanitation sector will be achieved through NGOs, private sector entrepreneurs and local bodies.

The Bilateral agencies and NGOs have incorporated hygiene education and sanitation promotion activities into their water supply programming. Although some efforts have been made in coordinating and sharing the methodologies each program has tended to go its own way. Plans for these programmes are not quantified in terms of output. Thus it has been difficult to assess plans and approaches in terms of their being suitable and cost effective. In general, this sector seriously lacks effective coordination, planning and budgetary mechanisms. It also suffers fro, lack of monitoring and feed back.

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1. HMG/N (1991) *Drinking Water Supply and Sanitation Sector Review and Development Plan*.

2. Dinesh C Pyakural (1992) *Country Evaluation Report of Hygiene & Sanitation Promotion In Nepal* WHO

MAP A SURVEY SITES LOCATION

2. ASSESSMENT OF EXPERIENCE WITH WUCs

2.1 Field Review

An extensive field review was conducted by a team of two senior male sociologists and one female assistance over a period of two months (December 1993 to January 1994). In addition, information was also gathered by all other team members, particularly the team leader and anthropologist whenever they made field visits. The main objectives of field review were

- to assess DWSS and other sector agencies project implementing strategies in the field,
- to obtain first hand information on coverage and sustainability of the water supply systems implemented by DWSS and other sector agencies, and
- to assess potentials for fastrack credit schemes for individual as well as group households to install a handpump.

Data was gathered on project implementing methodologies of various sector agencies. water supply, sanitation and hygiene coverage, technologies used, service level, people's perceptions on their involvement in future projects and taking over the O&M responsibilities Appendix B provides detailed information on field survey.

2.1.1 Survey Methodology

Sampling Procedure and Sample Size 48 schemes of various sizes and technology type were randomly selected from all over the country. Detailed information was gathered on 33 of these schemes where the researchers spent a minimum of 6 hours and often stayed overnight in the communities.

In order to get a better understanding of project implementation methods and sustainability DWSS, DDCs, NGOs and bilateral agencies schemes were included in the field review. Similarly, for a representative sample, schemes were selected from various development regions and geographical locations. Table 2.1 shows the various implementing agencies, scheme location and geographical distribution. See Map A for sample distribution.

Data Gathering Instruments Field information was gathered using a structured guideline for group discussions The guideline was specifically developed to gather information on existing water and sanitation coverage, service level and sustainability. Group discussions were conducted in a participatory manner with the water users and WUC members.

The average number of participants for the group discussion was about 10 persons Discussions were held for 2 to 3 hours. Women were encouraged to participate in the

Table 2.1 Summarized Characteristic Of Surveyed Schemes

Dev. Region	Location	District	VDC	Imple. Agency	Commut. Visited	Scheme Type	Pop. Served	Age Yrs
Eastern	Hill	Dhankuta	Pakharibas	Gorkha Welfare Trust	Majhgaun	GF	130	4
		Dhankuta	Ghorlikhark	DDC	Dhikure	GF	702	10
		Dhankuta	Ghorlikhark	DWSS · UNICEF	Diyale	GF	450	5
	Terai	Morang	Lakhantari	DWSS/PS	Labtoli	SHP	40	2
		Morang	Baijanathpur	DWSS UNICEF PS	Jhapatol	SHP	156	6
		Sunsari	Duhabi	DISVI/PS	Prastoki	SHP	240	3
Central	Mount	Dolakha	Kabre	DWSS	Kodare	GF	0*	2
		Dolakha	Kabre	DWSS	Hanumate	GF	0*	2
		Sindhupal-chowk	Bhotsipa	DWSS UNICEF	Shipatar	GF	463	1
		Sindhupal chowk	Maneshorara	DWSS	Maneshora	GF	537	3
	Hill	Ramechap	Baluwajor	Tamakoshi SawaSamuti	Seleghat	GF	294	1
		Ramechap	Those	DWSS	Akamphedi	GF	541	1
		Ramechap	Manthalee	DWSS	Macchedade	GF	288	1
		Sindhuli	Dadegurese	DWSS/PS	Dade	GF	1400	1
	Terai	Mahottari	Maisthan	LWS/NRC PS	Tuteshowr	GF	0	5
		Mahottari	Kisannagar	CARE/PS	Burjatol	DW	231	4
		Dhanusa	Bangdabar	DWSS/PS	Lalgadh	GF	4536	10
Western	Hill	Kaski	Rupakot	CARE	Pachitol	PS	102	7
		Kaski	Sisuwa	DWSS	Sisuwa	GF	7419	3
		Kaski	Sisuwa	NRD	Khalyan-Khundi	GF	500	3
		Syangja	Ramdi	DDC	Ramdi	GF	192	1

Dev. Region	Location	District	VDC	Imple. Agency	Commut. Visited	Scheme Type	Pop. Served	Age Yrs
Western	Hill	Tanahu	Dhulegouda	DWSS HELVETA	Ye de-Khet	GF	693	4
		Tanahu	Dhulegauda	" "	Kotre	GF	500	6
		Palpa	Dhovan	DWSS FINNIDA	Dobhan	GF	360	1
		Argha-khanchi	Sitapur	DDC	Budichour-bazar	GF	190	8
		Argha-khanchi	Simalpani	DWSS FINNIDA	Pawar	GF	520	1
		Argha-khanchi	Sandhikhark	DWSS	Hulaka	GF	6446	1
	Terai	Kapilbastu	Bahadurgunj	DWSS/PS	Bahadur-gunj	Pump	5646**	4
		Kapilbastu	Motipur	DWSS FINNIDA	Madhuban	DHP	1113	1m
		Kapilbastu	Labani	NRD/PS	Asuraina	SHP	500	4
		Rupandehi	Semalar	FINNIDA PS	Semalar	DHP	1350	1
		Rupandehi	Pharsatiket	DWSS FINNIDA PS	Pharsatiket	SHP	750	7
		Rupandehi	Khudabangar and Madhbani	DDC/PS	Piprpatiya	SHP	300	3
		Rupandehi	Gagoliya	Private	Mudiyari	SHP	180	NA

Dev. Region	Location	District	VDC	Imple. Agency	Commut. Visited	Scheme Type	Pop. Served	Age Yrs
Mid-Western	Inner-terai	Dang	Rampur	DWSS/ ADB II	Rampur	GF	5172	2
		Dang	Bijouri	DWSS	Hamen-tapur	GF	4250	11
		Dang	Dhikpur	Private	Katuki-sewar	DW	NA	1
	Terai	Bardiya	Sorahwa	NRD PS	Simara-Chowk	SHP	6	1
		Bardiya	Khirapur	NRC DWSS/ PS	Nimkotiya	SHP	133	5
		Bardiya	Khirapur	DWSS/PS	Pataha	SHP	210	3
		Bardiya	Gulariya	DWSS/PS	Bechipur	SHP	175	5
		Bardiya	Kalika	NRD DWSS UNICEF PS	Phulpur	SHP	120	6
		Bankey	Kamdi	DWSS/PS	Ujemasaha	SHP	49	7
		Bankey	Kohalpur	DWSS ADB II PS	Chhatar	SHP	42	4
		Bankey	Kohalpur	Water Aid Nari Bikas PS	Hulaktol	SHP	139	4
		Bankey	Chisapani	DWSS ADB II PS	Purano-Chisapani	SHP	230	1
Far-western	Mount	Bajhang	Hemantabada	DWSS	Heman-tabada	GF	2100	10
		Bajhang	Subeda	DWSS UNICEF	Rajabada	GF	294	1

*=scheme not functioning
**=only 40% receiving water
PS=Private systems

discussions. The female field assistant helped to obtain information from women on their perspectives regarding proper management of water and sanitation activities.

To obtain a better understanding of the water supply and sanitation satiation in the rural areas, the researchers walked through the community to do participatory observations and build up rapport with the people before conducting the participatory discussions.

2.1.2 Field Review Results and Principal Conclusions

All sector agencies involved in water supply and sanitation activities have detailed documented procedures and project implementing methods which stress community, particularly women's participation in the project development cycle. However, the field review indicates that only a few NGOs and Bilateral/DWSS schemes had actually carried out any degree of community involvement in the project cycle. Even in these cases, community participation was limited to WUC formation and providing material and labour for construction and agreeing to undertake responsibility for O&M.

In DWSS-alone projects community participation was limited to selection of locations for the standposts or handpumps which was done mostly by the influential persons of the communities. Table 2.2 shows involvement of communities in various agencies' project cycles

The principal conclusions from the field review are summarized as follows:

- All DWSS, Bilateral and most NGO schemes are target driven In some cases there was duplication of the schemes by two or three different agencies. This reflects lack of coordination

- Effective community involvement was absent in DWSS-alone projects In Bilateral/DWSS and NGOs projects it was limited to formation of a WUC, labour and local material contribution and deposit of cash for future O&M. These activities were carried out by a few selective persons.

- No active WUCs were found in DWSS-alone schemes. In the Bilateral/DWSS and NGO projects, formation of WUCs was also seen as a formality The beneficiaries were not given adequate guidelines on how to form a WUC and what are its responsibilities Members were selected by influential persons in the group.

Table 2.2 Level of Community Involvement in Surveyed Projects (degree to which community was involved)

Project Cycle	DWSS-alone Schemes	Bilateral/DWSS Schemes	DDC Schemes	NGO Schemes
Request	VDC	mostly VDC	VDC	mostly community
Pre- planning	none	none	none	some
Planning and design	none	identification of source and lay-out of standposts	none	identification of source, lay-out of standposts and assistance in initial survey
WUC's formation	none	some	none	some
Community mobilization	none	limited to labour contribution	none	limited to labour contribution
Pre-requistes	one community deposited Rs 350 for O&M per standpost	formation of WUC, labour,material contribution, and in some cases cash deposits	none	formation of WUC, labour, material contribution and cash deposits
Contractual agreement	did not know	did not know	none	yes
Construction	none	in some schemes labour and material contribution	none	labour and material contribution in most of the schemes
VMW Training	none	in some cases VMWs were trained, no tools given	none	2 to 7 days training was given in majority of the schemes Tools were also provided
Hygiene education and sanitation	none	in one community 50 latrines were built but most of them are not used In some cases verbal instructions were given during initial meeting	none	No effective programm exists. Only one local NGO succeeded in having latrines built in all households in the community
Operation and maintenance	where need for water was strong people were managing minor repairs	minor repairs are carried out by the communities	minor repairs are carried out by the communities	people knew that O&M is fully their responsibility and they are carrying it out
Women's involvement	none	provided labour during construction	provided labour during construction	provided labour during construction

- No training was provided to the village maintenance workers in any of the surveyed DWSS-alone schemes. In a few Bilateral schemes short training courses were given. All NGO projects had provided training and tool boxes.

- In some Bilateral/DWSS and all NGOs projects communities were required to deposit money for future O&M but they did not know where and who was responsible for withdrawing the money for the repair. Instead funds were collected on an ad-hoc basis as needed.

- Hygiene education and sanitation activities had been limited to a few verbal instructions and reminders to the beneficiaries by the technical staff during the initial period Only one local NGO succeeded in implementing latrines in one community.

- Womens' involvement was very limited to a few Bilateral/DWSS and NGO projects One or two women were nominated by the male members for WUCs or standpost committees They had no say in project planning or management. However, in all projects where households were asked to provide labour for the construction of the scheme they sent their women

2.2 DWSS Arrangements and Budgets for Community Liaison

Community liaison comprises support to the community to establish management skills, community ownership and assumption of O&M responsibilities for their schemes. It includes.

- creating awareness for hygiene and sanitation improvements
- women's workers/volunteers training
- VMWs training
- PRA workshop for WUCs and other community members
- training of DWSO technicians and overseer in communication and community development skills
- logistic support to above

At this stage, information is being gathered on the above issues. The following section highlights some major points in DWSS community liaison activities

Methods and approaches

DWSS has well established Directives and Standards to follow in community based approaches However, so far these rules have not been consistently adhered to. Bilateral and DWSS programmes and now ABD III have made serious attempts to incorporate participatory community based approaches but with limited success. ADB III in particular, has extensive expertise at the central and regional levels but this experience is too thinly spread to have adequate impact at the project level. In addition, the target oriented nature of the projects selected for ADB III dose not allow a meaningful participatory approach.

The Central Human Resource Development Unit within DWSS is involved in developing training materials and methodologies. The CHRDU is also responsible for conducting training courses for DWSS and Bilateral projects through its five regional level training units. However, its courses tend to be technically oriented and lack the necessary participatory content.

Human resources

In DWSS and Bilateral projects technicians and overseers are the only contact persons in the community and the only means of introducing participatory approaches. Their activities tend to be limited to survey and construction. After the completion of the scheme they rarely visit the community. These technicians do not have adequate communication and community development skills and being male they fail to reach women. It is recognized that Bilateral projects have provided stronger training for overseers and technicians but the impact of this training was not evident in the survey sample.

The Directives require the formation of a WUC in each water supply project community to accept responsibilities for O&M. The field survey indicated that none of the DWSS-alone schemes had a functional WUC. In Bilateral/DWSS projects WUCs were formed mostly to fulfil the pre-requistes but the majority of them later became non-functional Similarly, in DWSS-alone schemes, technical training for VMWs was found to have taken place in relatively few communities. In Bilateral/DWSS projects have been providing training and tools to the VMWs. To strengthen community human resources, Bilateral projects are also beginning to train community based volunteers, local community health workers, school teachers and women sanitation workers. But these activities are limited to a few selected areas and are in their initial stages.

Financial resources

Community liaison has not been separately budgeted Efforts have been made to separate cost for community liaison from other components but the accounting procedure use by DWSS and Bilateral project has made it impossible On the other hand 7.5% of DWSS water supply construction budget has been set aside for sanitation and hygiene education. Information will be gathered later on breakdown of the 7.5% as expenditure items and other costings for training and mobilizational activities.

2.3 Mobilization of Community Resources

The policy Directives and Standards prepared for the DWSS and other sector agencies require mobilization of community resources to sustain water supply schemes. The Eighth Plan proposes that beneficiaries contribute 5 to 20% of capital cost. However, the field experience indicates that in DWSS-alone schemes community contribution was minimal or not at all In some communities people stated that they were asked to provide 10% of the total cost in terms of material and labour, but later the scheme was given to a contractor for the construction The contractor hired the labourers from the community and they did not have to contribute The majority of the schemes implemented by DWSS-alone did not make any arrangements for

O&M. All most all surveyed projects were implemented with out a WUC. In a few cases where they might have been one previously, it was no longer functioning. Similarly, no training or tools were provided to the beneficiaries to manage the scheme on their own. Where need for water was strong communities were managing minor repairs on their own. In case of major repairs no back-up support was stated as being available.

On the other hand, in Bilateral and most of the NGO projects, communities were contributing 20 to 40 % of the total cost, mostly in terms of local material and labour. They were made responsible for O&M and minor repairs. Each community was commonly required to deposit some amount in a bank account for this purpose. One or two persons were trained in scheme maintenance and in the case of gravity flow schemes care takers were appointed and paid monthly by the community In the case of major repairs in a few projects, back-up support has been provided

2.4 Recommendations to Improve DWSS Community Liaison

It is readily apparent that although DWSS policies, strategies and training have been reoriented towards community management, and that it is appreciated as crucial to sustainability of schemes by senior management at the centre, there is resistance to it, a lack of understanding of it and underestimation of its importance by the vast majority of mid and lower staff in the districts. This is a fact despite many years of experience in implementing rural water and sanitation, and many millions of rupees spent in trying to inculcate community based approaches into DWSS programmes.

Why?.. .... some of the underlying reasons are:

1. That DWSS is wholly an engineering organization Its professional staff are all engineers or technicians. With minor exception, all key posts are held by engineers. This may have been appropriate when programmes were highly centralized and DWSS was intended to work with major schemes but it is no longer appropriate when most of its hundreds of schemes serve less than 500 people and it is faced with trying to convince them all to assume long term responsibility for maintenance. The tasks ahead demand social, communications, managerial and developmental skills. To succeed, DWSS must change. Somehow it must now acquire these skills either by direct recruitment or bringing them in from the private sector in large numbers so that they directly effect programming at the district levels.

2. That DWSS has been faced with having to respond to many and disparate external pressures being donors (with their own and various policies and targets), politicians of local and central origins, budget controllers and national planners. This would not be so curtaining if they had common goals and approaches. They do not. Coordination, policy dialogue, rational planning and transparency is urgently required to rationalize and make these demands commensurate In a nutshell, to make this sector accountable to the end users and owners of the schemes the community.

3. That DWSS is supply and target driven. This is drawn from the fact that programmes exist when and if there is money, and most of it from the outside. Also that success is measured in money spent and numbers built and not in health/lives improved, communities strengthened or sustained services achieved. A change is needed in the way we measure success

4 That DWSS remains centralized Key decisions (staffing, budgets, policy, promotions/transfers, methods) are taken at the centre. The message is in the media. There is little wonder that DWSOs are slow to respond to "directives and standards" demanding participatory approaches and devolution of authority to the community. Decentralization and participation will have to be practiced at all levels.

5. That despite the many reporting systems, accurate information on field activities and scheme status are seriously deficient. Without good information from past and ongoing projects, there is little hope for an accurate understanding of the problems to be faced or of resolving them An impartial, functional and accessible information system is urgently needed

6 That this sector is primarily accountable to the central bureaucracy, the politicians and the donors whereas to succeed it must become accountable to the community, its environment and national development. This implies a whole change in sector orientation, in the way it does business, in its partner organizations and in the way it relates to its ultimate client, the community. These are the issues with which DWSS is grappling. To succeed, not only DWSS will need to change, but the whole environment in which it operates and in the masters to which it responds.

At first, some of the above may at first seem unrelated to issues of community liaison and therefore out of place. But, we submit, they are all highly relevant to the difficulties facing DWSS in its objective of achieving sustainability through community management.

3. HANDOVER OF COMPLETED SCHEMES

3.1 Municipal, Pumped and Large Schemes

This category of schemes represent the more difficult and expensive to operate and maintain. Consequently they are the most difficult to handover but are first in priority in view of the financial burden they presently impose on DWSS. The numbers and types of schemes are listed in Table 3 1 1, further details are presented in Appendix D.

Table 3.1.1 Municipal Pumped and Large Schemes Maintained by DWSS

Category	No. of Schem.	Constructed or Rehabilitated within 4 years	In need of repair or rehabilitation (estimated)	Avg. Age	Range of Age	Range of Served Popl.
Municipal pumped	14	10	4	3	1 - 14	10,000 - 25,000
Municipal gravity	8	5	3	4	1 - 12	10,000 - 30,000
Non-municipal pumped	18	8	10	6	1 - 15	1,500 - 10,000
Large gravity > 7000 design pop	51	20	31	6	1 - 17	4,000 - 7,000
Large gravity sch 5000 - 7000 design Pop.	40	7	33	10	1 - 14	3,000 - 5,000

Although the average age is generally six years and under, over 80 of these schemes will need rehabilitation and most others will need some kind of repair before handing over.

The financial burden these 131 schemes represent is substantial. The total staff required to operate and maintain them is 540 and the cost of O&M, energy, supplies and materials and overhead is estimated to be in the order of NRs 27 million/yr.

In addition there are 852 other smaller rural projects of which only 70 have been handed over (apart from the 950 CWSS schemes assumed already handed over). This means that there are 782 smaller projects (most comprising at least two schemes) yet to be handed over. The financial burden of these schemes is estimated to be around NRs 35 million/yr.

The total annual cost of NRs 62 million is not recorded officially as maintenance expense due to the nature of the accounting system and the fact that staff and expenses are commonly "borrowed" from development budget line items to fill the O&M gap. The Tansen system is a prime example of this practice

Difficulties in handover of the larger and complex schemes are the result of

Reluctance to assume responsibility

The majority of these schemes are large and were not designed and constructed for community maintenance Many of the pumping schemes with overhead tanks are neither financially or economically viable nor least cost technical options. Further, the concept of cost recovery and sustainability was given little thought while designing and implementing these schemes with Tansen being a prime example. In addition, communities were neither involved nor consulted during planning and implementation It is not surprising then that communities are reluctant to take over these large schemes.

Need for rehabilitation

Most of these schemes do not provide the level of services they were designed for due to lack of adequate O&M and calibre personnel. The majority of these large and complex schemes provide intermittent services and require rehabilitation.

Inadequate cost recovery

Tariff rates used are wholly inadequate. At that, revenues are deposited into the consolidated revenue of HMG providing little incentive to DWSS to raise tariff and service levels. These schemes remain heavily subsidized and therefore under political influence Unfortunately, the result is that they continue to provide substandard service with little hope of improvement under the present system of management. Indeed DWSS cannot improve service levels given present budgetary levels , but the problems are not only budgetary.

Commitment for handover

Although there is a set policy to handover completed schemes, there has been only limited planned and coordinated effort to put policy into practice. Priority is first given to the extension of coverage in an attempt to meet targets set by government.

3.2 Experience with handover of smaller schemes

The experience in handing over smaller schemes has been better Out of 852 projects, 70 (including 24 from ADB I) are handed over All the CWSS schemes are sustainability operated and maintained by beneficiaries.

The CWSS schemes were successfully handed over because of:

Smaller scheme size

Generally a CWSS project is a single scheme. The served population is usually less than 1000 and always below 1500. Being smaller in size, the quality of construction and supervision is

also comparatively better. Smaller communities tend to be cohesive and therefore community management of schemes is more feasible.

Community participation

During implementation communities were always involved in CWSS schemes. Their contribution was around 15 to 30% of the total cost of the scheme, mostly in the form of unskilled labour. This contribution has helped create a feeling of ownership and in the community taking over the schemes.

Trained VMW

VMWs were trained in each scheme/community during the construction The construction was carried out through users committees. Thereby, beneficiaries were able to understand the various components of the schemes and their functions. At the handover, spare materials and tools were given to users' committee. This also helped users gain confidence in carrying out O&M on their own.

Felt - need

CWSS projects were very carefully selected on the basis of felt-need, communities willingness to participate, and potential for community management.

3.3 Recommendations

The handover of these 130 large and complex schemes should be the top priority of the DWSS which would eventually result a net saving of at least NRS 27 million per year. For this, a **Handover Unit** needs to be established as a special office at an appropriate level in DWSS having branches in each regional office. This Section would carry out studies of the projects and establish detailed procedures and workplans for handovers.

Of the 22 municipal systems, 15 are either recently rehabilitated or under rehabilitation. The start made by DWSS to handover the Bharatpur scheme to the private sector is entirely appropriate. The other 14 municipal schemes can be handed over to municipalities, private firms, NWSC or separate independent utilities on a case by case basis. The remaining seven systems are 10 to 14 years old including Tansen. The Tansen system is unlikely to be handed over in its present form. Priority is needed for rehabilitation of the other six schemes in order to handover these schemes to an appropriate agency.

For those 18 pumping schemes outside municipalities, the handover process should follow similar procedure to the municipal systems. The old and larger systems need rehabilitation. Out of the 51 large complex gravity schemes with design pop > 7000 people, 20 are recently (within 4 years) completed. Priority is needed to handover these schemes. The remaining 31 schemes may need some kind of repair works. Likewise, out of 40 large gravity schemes with design pop. between 5000 to 7000, seven are recently (within 4 years) completed. These schemes could be handed over in this fiscal year. The users' Committee is the best agency to

takeover the majority of non municipal gravity schemes. For those exceptional cases, investigations should be carried out to identify the agency which may be a VDC or even a private sector firm.

It is clear that all schemes will require rehabilitation or repair of one form or another. This should looked upon as an opportunity rather than a burden. Generally communities and municipalities are indicating a willingness to undertake ownership and responsibility if the schemes are brought up to a modest service level. They should brought into the process and given decisionary powers over their schemes upgrading before hand over If these opportunities are taken, they will greatly enhance the potential for future user management

The Handover Unit

Strong recommendation is made to make "handover" a top priority program within DWSS Continued provision of maintenance to existing schemes is against government policy Besides, the allocated budget of 50,000 Rs/yr per district is wholly inadequate. O&M is costing government very large sums which would be better used elsewhere, most are being drawn from development budgets Generally communities are willing to assume responsibility, if the systems are rehabilitated to provide the level service they were originally designed for This is an ideal opportunity for DWSS to shed responsibility and expense thereby relieving pressure on reportedly tight budgets and staff shortages in the districts. The missing demand is a commitment within DWSS which can focus, monitor, support and in fact drive the effort forward.

The Handover Unit is recommended to be attached directly to the office of the DDC, Planning, Human Resource and Community Development. The functions of this unit would be to

- study and prioritize schemes for handover
- develop workplans specifying the steps, responsibilities within DWSS, budgets and schedules to carry out each handover
- set targets, recommend staffing and ensure adequate budgets and logistics for the handover program of district level.
- provide technical assistance to the handover preparation process
- monitor, evaluate and provide feedback to DWSS sections carrying out the program at district level.

The following steps are suggested as procedure for handover.

1. Undertake indicative studies of all large/pumped/municipal schemes in order to establish

- status of the systems and history or background
- perception of users
- possible management options
- legal requirements
- political situation
- pre-requisites and pre-conditions

- rehabilitation/repair requirements including costs
- costing of O&M
- staffing and HRD requirements

2. Prioritize the schemes

3. Conduct more detail studies on the above (a) to (i) on priority schemes

4. Allocate resources

- publicity and preparation of communities
- creation of an organisations for management
- recruitment and training of staff
- establish a system for administration
- rehabilitate/repair
- meet legal requirements for handover
- establish tariff and financial management
- achieve handover
- provide continued monitoring and technical assistance support

The following table provides suggested tentative handover schedule for the larger schemes

Table 3.3.2 Handing-Over Schedule of Urban, Large & Complex Schemes

	1994	1995	1996	1997	1998	1999	2000	Total
Municipal Systems	3	6	7	5	1			22*
Pumping Systems	4	4	5	5				18
Large Complex Gravity Pop > 7000	5	7	10	12	8	5	4	51
Large Complex Gravity Pop between 5000-7000	6	8	8	10	4	4		40

4. DWSS FASTRACK CREDIT PROGRAMME

4.1 Background

HMG and NGOs have been actively providing water supplies through shallow well handpumps in the Terai since the mid-1980s. By-and-large these programmes have been successful as the technology is simple, well known and inexpensive to maintain. Over the past decade the private sector has become very active in selling shallow well handpumps to the middle and upper income groups Over the past five years as messages about the consequences of using unprotected dugwell water permeated through the Terai, open dugwells have been more and more allocated to livestock, while handpumps have become popular for drinking water by all strata of society. Private handpumps are available locally for as little as Rs. 1200 and they are now frequently purchased by the lower income groups such as the Tharu and Chamars.

This gave rise to reflection on (1) inclusion of private sector coverage in official figures and (2) the potential for credit rather than subsidy in encouraging improved water sources in the Terai.

The project team undertook a survey through the Western half of the Terai from Bardiya to Rupandahei during early February to get a first hand impression on coverage and the potential for a credit scheme for handpumps In depth discussions were held with villages in eight communities comprising people from a wide variety of ethnic groups and castes including the lowest Conclusions are summarized as follows:

- coverage should include private sector Handpump within 150 meters of the households on the Terai. These handpumps (including the No. 4) are maintained by householders with readily available spare parts. Most pumps are fixed with such items as wire and rope used bicycle axles ..... but they work and they provide clean water, 24 hours a day right next to the home .... and they are sustainable with no outside support

- there was no significant complaint about the quality of water. FINNIDA has conducted a water quality analysis program involving over 400 Faecal Coliform samples. 96% of samples meet WHO standards during both dry and wet seasons where handpumps are provided platforms. Where no platform exist water quality is still acceptable but from an environmental perspective simple platforms should be encouraged (although not essential)

- the private sector is providing the vast majority of handpumps ... and coverage, although NGOs and DWSS remain actively working with lower income groups

- the impression given by numb s of handpumps available is that coverage is in the range of 80% However, coverage in less accessible VDCs may be less More impartial surveys such as those carried out in the Lumbini Zone districts are required.

- lower income families are affording shallows well handpumps (Rs. 1200-1500). Retailers, installers and repairers are available and most households have an appreciation for the technology and how it works.

- investigations were made into the possibility that (a) disputes between private owners are restricting sharing of pumps and (b) caste differences would not allow certain castes to share a common pump.

  (a) responses repeatedly indicated that alternative handpumps (private and public) were available to women who were faced with being restricted from use of their usually shared pump as a result of a dispute with its owner, and

  (b) shared pumps are used by higher and lowest castes but not at the same time. When higher is using the pump then lower waits until she is finished, and visa-versa

- sanitation is universally lacking and should be included in the credit scheme but households should not be coerced or forced to accept latrines. Education and motivation should be used to market sanitation.

- there is still need for a community based programme to meet basic needs of the very poor (perhaps lowest 5%) of the population. This can be met by NGOs already working in the Terai. FINNIDA is also developing a matching fund concept which deserves pilot testing.

Too Many Handpumps?

In the village of Pharsaticket, 10 km from Butwal there are over 100 handpumps (4 of them from Government) for a total of 125 houses A few houses have 2 or 3 handpumps, 30 have none The poor share use of private pumps When a dispute results in their being restricted from one handpump there are always alternative handpumps which they can use

The village is fully covered by water supply Yet, 5 new public handpumps are being installed. One of them is only twenty feet from an existing public pump The people say that the new pumps will be useful, especially for the livestock. On enquiry, it was found that the new pumps are politically motivated

- further surveys as outlined below are needed but indications are that subsidies will not be needed, and that market prices for handpumps are affordable by the poor provided a fair, transparent and effective credit support is made available.

- all agencies (including DWSS/ADBIII/UNICEF) should carefully review their objectives and shallow well programmes in the Terai. They should also carefully survey their areas for existing supplies and coverage and ensure that they are not providing pumps where (1) they are otherwise affordable through credit and the local market and (2) they are otherwise not needed and are being given supplies for political purposes.

4.2 Objectives of the Handpump Credit Pilot Project (HCPP)

The objective of the HCPP is to investigate the efficient flow of credit funds to final users (domestic water groups representing 2-5 families) for the purpose of:

- rapidly increasing water supply and sanitation coverage in the Terai
- mobilizing local family members for domestic community services for ensuring long term sustainability of hand pumps, and sanitation facilities
- involving local family members in activities related to improving health and hygiene conditions for increasing agro-industrial productivity of family labour,
- ensuring technical control and supervision by DWSS
- providing positive motivation to improve implementation performance at both agency and group levels,
- increasing accountability to the end users by their acquiring their own hand pump and sanitation units,
- promoting privatization, and
- ensuring demand-driven technical assistance.

4.3 Policies

- HCPP would finance domestic hand pump and sanitation schemes owed and managed by individual or groups of local families known as Domestic Water Groups (DWGs)
- all domestic hand pump schemes under DHPP would meet specific criteria and be selected, prepared, constructed, and commissioned according to agreed project cycle procedures,
- HCPP will follow an area approach in serving the Domestic Water Groups
- DWSS will prioritize Terai districts on the basis of technical feasibility extent of water supply coverage. The districts least covered by water supply facilities will first get the programme,
- a part of the investment fund would continue to flow to DWSS through normal channels for financing DWSS administrative and technical support functions necessary for the implementation of the programme,

- DWGs will only bear the capital cost of the hand pump and sanitation units,

- costs of DWSS technical and administrative functions, training of DWG members and local technicians, and consultants/NGOs will be borne by the government,

- ADBN/RDB would charge an interest rate on the credit, taking into consideration the socio-economic characteristics of the sub-sectoral investment and service charges,

Income Generation through Handpumps by the Chamar

The idea of private handpumps on credit was introduced to the Chamar community of Nimkothiya west of Gulariya They already shared seven handpumps between their 19 houses but were keenly interested in obtaining more They saw benefits of backyard handpumps as being both for drinking water and vegetable gardening The vegetable produced would also be used to generate income to pay back the loan for the handpump

- DWGs making timely payment of credit will get forty percent rebate on the interest rate, and

- HMGN would maintain policies and conditions conducive to the efficient implementation of the HCPP

4.4 Programme Procedures

The following steps in the programme and individual schemes are suggested

- DWSS (in association with the lending bank) identifies and prioritizes district/s suitable for HCPP,

- DWSS defines technically acceptable hand pump and sanitation unit options which are locally available,

- DWSS and the bank(s) mount a marketing campaign in the prioritized areas giving full details of the technologies, credit opportunities and procedures,

- DWSS and lending bank(s) select several retailers/mistris in the areas and provide them training on the scheme and the handpump and sanitation technologies. They are licensed to work as part of the programme,

- the bank's extension officer visits households applying for the loan to satisfy group guarantee requirements,

Technology Transfer from Terai to Dang

About 8 km from Gorai in Dang District lies the village of Sawar It has 14 households Its Tharu people were approached by mistris from the Terai offering protected concrete lined open dug wells for Rs 5000 each They pooled funds and had built two, providing water for all 14 houses.

In addition, the mistris trained a local labourer and sold him the forms for making the concrete rings He is now offering wells to other villages of Dang at an even cheaper price That's the private sector at its best

- the bank's extension officer provides DWGs with detailed cost breakdown of the technologies selected by the DWGs,

- agreement is reached with DWG on the loan, and coupons are issued to DWG to forward to its choice of licensed retailer/mistry,

- in accordance with the loan agreement which stipulates the type of technology(s) and the coupons issued, the retailer/mistry visits the households and installs the pump (and sanitation units),

- the retailer/mistry provides training to DWG on (1) hand-pump maintenance, (2) group management of hand-pump (3) sanitation unit use and maintenance, and

- after construction the retailer notifies DWSS which makes a site visit and approves payment of the retailer/mistry by issuing a work completion certificate,

- retailer/mistry provides a one year workmanship and materials which makes a site and approves payment of the retailer/mistry by using a work completion certificate,

A small monitoring unit would be established for the pilot project to ensure rapid feedback on progress and problems facilitating early correction of problems as they arise. A mid-point evaluation would make an overall assessment permitting formal adjustment of procedures.

4.5 Credit Eligibility and Prioritization

- each DWG consists of one to five contiguous member households (with at least half of members as women from the households), and

- each DWG puts an up-front share of 20 percent of the total capital cost of the scheme immediately after their demand for credit is approved.

4.6 Benefits of Procedures

- technical quality of the project is assured as DWSS is responsible for this task which is separated from other implementation functions, such as loans and repayment,

- the bank(s) are experienced in small development loan procedures which will permit strong financial management and controls,

- the bank(s) will pay the local retailer/mistry on behalf of DWGs which avoids risks of misappropriation of cash flow to the DWGs,

Taking Turns in Repairing the Handpump

The Tharu community of Bechipur, Bardiya invented its own way sharing responsibility for its DWSS handpumps Each family takes turns Once one family repairs and pays for the handpump repair it passes the responsibility to its neighbour thus, responsibility is clearly held for pump maintenance one family at a time The rotation system has worked successfully for over five years Only when a major break occurs is a general collection made from all users.

- people identified as relatively more disadvantaged in terms of socio-economic status get equal opportunity to develop their socio-economic standards and productive conditions,

- resources (both financial and physical) are efficiently utilized and sustainably mobilized at the grass root level with the effective participation of the local people.

4.7 Risks

- highly subsidized credit environment in the water supply and irrigation sub-sectors is likely to create disincentives for the local people to apply for credit. This HCPP would work in areas where subsidized drinking water programmes are not operating,

- preference for handpumps exclusive of sanitation units would bias application towards the former. Sanitation would be strongly encouraged through education, motivation and training of mistris,

- lowest income families would be reluctant to accept loan conditions distorting the program towards higher income groups. This will be limited by selecting lower income pockets as priority areas, and

- inequity of credit distribution due to higher income families receiving credit This risk is reduced by the more wealthy families already having handpumps in the Terai and credit being provided at near commercial rates with no subsidy on the price of the handpump.

4.8 Institutional Responsibilities

Task	Contractor/Retailer	DWG	DWSS	Leading Agency
Survey			o	
Area Prioritization			o	o
Licensing & training retailer/mistris			o	o
Information Dissemination	o	o	o	o
Lending Agencies field setup				o
Applications		o		o
Field verification of the applicants		o		o
Loan approval				o
Retailer/Mistry notification		o		
Pump & sanitation units installation	o	o		
Certification of commissioning	o	o	o	o
Notification for final payment		o	o	
Repayment	o			o

5. DWSS ARRANGEMENTS FOR OPERATION & MAINTENANCE

5.1 Introduction

Since its inception, DWSS has operated and maintained water supply systems that it constructs After completion of a project, DWSS assigns O&M staff consisting of water supply technicians, plumbers, watchmen and labourers to look after the system. The number of staff depend upon the size and complexity of the system. DWSS operates and maintains all the water supply projects it has constructed in the past except for 13 projects handed over to NWSC and 70 projects handed over to local villages and towns.

Since the early years of the DWSS programme, various attempts have been made to have the community assume O&M responsibility, but DWSS also undertook the responsibility for the initial 2-3 years, as a temporary solution. In practice however, this temporary solution has continued beyond the initial 2-3 year period to become permanent. This has created a dependency syndrome among the users and reluctancy to assume ownership of the systems.

5.2 Organisational setup

Project Maintenance Staff

There are 1417 temporary maintenance staff in DWSS to look after 983 completed projects The actual number is probably higher as they are commonly paid out of other budget line items. There is no well defined job description for these maintenance staff and most of them are untrained In the past, sanctioned posts for operation and maintenance have been revised each year depending upon the number of newly completed projects.

Table 5.1 Temporary Maintenance Staff

Region	Technicians	Administrative	Peon/watchman	Total
Eastern	85	1	129	215
Central	179	1	197	377
Western	198	4	210	412
Mid Western	105	2	146	253
Far Western	78		82	160
Total	645	8	764	1417

DWSO Maintenance Unit

Each DWSO is planned to have a separate unit with permanent staff to monitor and to assist with operation and maintenance of completed schemes. O&M staff are meant to report

regularly to this unit on the status of their systems and on maintenance works that they cannot undertake on their own. Each O&M unit of DWSO has provision for 4 technicians (WSSTs) and 2 to 4 overseers (O/S). The O&M workload at present surpasses this small staff making temporary staff essential.

Regional Maintenance Unit

The Regional Maintenance Units have one assistant engineer & one overseer under the supervision of a deputy regional director. The Regional Maintenance Units are mandated to

- prepare estimates for minor and major repairs for projects in the districts,
- coordinate material procurement and help transport them to project sites, and
- supervise the major repair works and provide technical support if asked for by the districts.

Central Repair & Maintenance Section

The Repair & Maintenance Section of DWSS has one senior divisional engineer, two assistant engineers & two overseers. The section coordinates and supervises the repair & maintenance works of regional and district maintenance units.

Table 5.2 Completed Projects & Maintenance Staff

Year	No of Completed Projects	Temporary O & M Staff	Average Staff Per Project
047/48 (1990/91)	370	1421	3 84
048/49 (1991/92)	497	1421	2 86
049/50 (1992/93)	737	1411	1 91
050/51 (1993/94)	913	1417	1 55

5.3 Existing O&M Arrangements

DWSS water supply projects are in two categories :

Projects maintained jointly by DWSS and WUCs

In case of jointly managed projects, there is little co-ordination between WUC members and DWSO staff. In forming the WUCs the trend has been that emphasis is on construction Communities are seldom aware of their responsibilities of O&M, on the contrary they act as a pressure group to exert pressure on DWSO even for minor maintenance work In the case of projects handed over to the community, there is no follow up, monitoring or evaluation systems to check or support the performance of the project or the effectiveness of the WUCs in maintaining them.

Projects maintained by DWSS.

In the case of DWSS managed projects, operation and maintenance is poor due to lack of adequate funds and regular supervision Proper budgeting for O&M expenditure on each project has not been developed by DWSO. Little attempt has been made to collect tariffs from public stand posts in DWSS systems. Tariff rates applicable to house connections are only nominal, revenue being sent direct to Treasury and having no impact on O&M efficacy of DWSS Households are often reluctant to pay even these nominal charges. There is basically two reasons for this :

- the beneficiaries feel that they received the project as a gift from government.
- many of the systems are not functioning properly and service level is poor.

5.4 Budgetary Arrangements

Budget allocation for repair and O&M is rather ad hoc. There is no separate O&M budget sanctioned for completed projects on a project wise basis. The nominal budget of Rs 25,000 to 50,000 is allocated to each district office each year as a lumpsum for all completed projects in the district, regardless of the number of projects or their functional status. This O&M budget is inadequate to take care of even routine problems. Special allocations for major repairs are sometimes made but there are frequent delays in receiving funds and procurement

Reported costs for O&M of DWSS operated systems amounted to Rs. 24.41 million in 2047/48 (1990/91), of which about 80% was for labour costs. This works out to an average of about NRs 65,000 per project per year. Commonly O&M expenses are also drawn from development allocations. In fact the actual costs of O&M is over twice this amount.

Table 5.3 DWSS O&M Budget

Budget in '000 NRs

Year	No of completed Projects	O&M Budget				O&M Budget Per Project
		Overhead (Administ.)	O&M Fund		Total	
			Central	District		
047/48 (1990/91)	370	17660	4500	2250	24410	65
048/49 (1991/92)	497	23500	5500	2250	31250	62
049/50 (1992/93)	737	27000	5000	3750	35750	48
050/51 (1993/94)	913*	27000	7650	3750	38400	42

* Excluding 70 projects handed over to WUC

Table 5.4 Total Budget & O&M Budget

Budget in '000 NRs

Year	Total Budget	O & M Budget*	O & M as % of Total
047/48 (1990/91)	623762	24410	3 91
048/49 (1991/92)	845090	31250	3 69
049/50 (1992/93)	1054231	35750	3 39
050/51 (1993/94)	1139193	38400	3 37

* Excluding O&M budget for DWSS/UNICEF Projects

5.5 MHPP Directives & User's Committees

According to MHPP Directives 2047, Water Users Committee (WUC) should be formed to look after the implementation, O&M, expansion and extension of the project with assistance from DWSO The users committee should be responsible to collect funds to pay the VMWs salary and for the materials and additional labour for all but major repair works The agreement clearly defines the responsibilities of each signatory for the implementation of the project and for O&M after completion. However in practice this has not been followed

5.6 O&M responsibilities of DWSOs according to the MHPP Directives 2047

MHPP Directives 2047 clearly mention the following O&M responsibilities of DWSOs ·

1. Training of VMWs/Technicians . DWSS will make all arrangements for trainings of VMWs and technicians. DWSO will also train WUC members to enhance their managerial, administrative and technical skills.

2. Technical support to WUC · DWSS will provide technical support for major maintenance/repair works which can not be done by VMWs/WUCs on their own.

3. Support for major repair works : DWSS will make available construction materials (except local) and skilled labour for major repair works.

4. Regular Monitoring : DWSS will monitor technical and community management aspects of the project at least 2 times per year and will submit report to Regional Directorates & DWSS.

5.7 Handover of completed projects for O&M

DWSS plans to handover the schemes it presently maintains to the users. The handing over requires in most of the cases the following activities:

i) rehabilitation of the scheme, so that it is technically fully functional.
ii) formation of users' committee

iii) selection & training of village maintenance worker
iv) training of users committee in the management of water supply schemes - mobilization of people for the maintenance activities, fund collection & accounting

However there is lack of clear procedures for handing over the completed projects to WUCs It has simply mentioned in the directive that completed projects are to be handed over to the WUCs. In the directives, all projects of varying magnitudes in size, technical complexities are kept in on the same footing, irrespective of the capability of the community to manage operate such projects. The completed projects should be categorised and phase wise handover program must be started with suitable handover arrangements for each type of the project. Reference is made to Section 3 of this report and its Appendix D.

5.8 DWSS O&M support to the community

The community based approach of development will require greater support from the implementing agencies to enhance the community's capacity to sustain the projects The additional support should prepare the community for responsibility of O&M of completed projects.

In spite of the community based approaches illustrated in the Directives, there has been limited success implementing them. Some of the additional support services that would promote effective community based water supply projects are the following:

1. *Technical Support Team:* There is a need to establish a support team at the district to provide adequate technical support to WUCs. The members of this technical team should visit each project at least twice a year to monitor the management of schemes, provide necessary support to WUCs & VMWs and to report regularly on the status of projects to DWSO.

2. *Facilitator/Promoter :* DWSS lacks community development workers to assist in the software component of projects as most technicians are trained only in hardware aspects DWSS needs dedicated extension workers who are educated or trained in community development skills to effectively promote software activities.

3 *Stock of construction materials & spareparts :* Adequate stock of pipes, fittings and other construction materials required for new constructions & repair/maintenance works should be available on the market or at DWSOs. DWSS should try to facilitate the sale of spare parts in the local market or develop a service network of spare parts for O&M Arrangement should be made for the WUCs to be able to buy them at reasonable prices so that maintenance & other minor repairs are feasible.

4 *Monitoring :* A joint monitoring of systems by the community & DWSO representatives should be carried out periodically to judge the system's performance status and try to overcome the deficiency jointly. Project progress should be monitored in terms of behavioral changes as well as physical output The result of monitoring should be used as the basis to further enhance the capability of the community.

5. *Training support:* The community based approach will require major changes in the skills and orientation of DWSS/DWSO staff to suit their new job role. To support and encourage the changing roles a comprehensive training program that is responsive to the needs of the community is required. The community organizations have to be strengthened by providing orientation and training to community members on the management of O&M of the facilities provided, thus enhancing more the prospect of sustainability of the project. This is being attempted by the CHRDU

6. *Hygiene Education & Sanitation:* Unless beneficiaries understand the relationship of health & hygiene with water, the intended benefits of potable water are lost The water supply program needs to be integrated with sanitation, health and hygiene education programs of other sectors. Effective coordination with other sectors will have to be established to ensure improvements in the health.

6. DWSS ORGANIZATIONAL SET-UP AND OPERATIONS

6.1 DWSS Organization

The organizational chart for Central DWSS is presented in Appendix C. At present there is one Deputy Director General. The organization is divided into ten sections whose titles describe their functions. The DWSS operates through five regional and 75 district offices whose organization charts are also presented in Appendix C.

District offices are typed according to size and responsibility A, B, C and D Types B and C are similar. There has been a recent reorganization of district offices (DWSOs). A new section titled the Human Resources and Community Development Services Section (HR & CDSS) has been created. Although this section has been subdivided (on paper at least) into Sanitation and Training functions, the section itself is yet to be functional in almost all DWSOs Male staff have in general been identified and posted however, female workers (one per district) have yet to be recruited

The key operational sections in the DWSOs are the Technical and the HR&CDS Sections. Their key staff are similar in background and qualifications being overseers (O/S) and water supply and sanitation technicians (WSSTs). In practice these sections work as one in that the O/S and WSST work in both software and technical capacities. Depending on training the O/S and WSST are often competent in technical matters but seldom do they have adequate communications and community development skills to work effectively in participatory roles.. The exceptions are those who have been trained through UNICEF, HELVETAS and FINNIDA training programmes.

Experience has amply demonstrated the difficulty in transforming a technically oriented O/S or WSST into a qualified and interested extension worker. All too often the software component is not given adequate priority and resources. This, coupled with ill-prepared technicians being made responsible for community dialogue makes sustainability of schemes through community management all but impossible.

Creation of the HR&CDS Section at the district level is a first step in the right direction but to be effective, it must be properly staffed and given an appropriate level of authority. It should be led by professionals having skills and education in training and community development It should be given authority over the software component of projects and be able to disallow proceeding to design or construction until community support requirements are met This section should be staffed primarily by women. Hiring "female workers" is only a beginning While viewed by CHRDU as trainers, their qualifications will not allow them to fill that role. They will have only eighth level education.

Reference is made to Section 8 of this report in that the numbers of staff at district level are far greater than indicated in the official organogram. Temporary staff (almost all technicians) are employed in numbers of up to two to three times the number of permanent technicians

These are employed primarily in O&M of completed schemes. Unfortunately, they tend not to be provided adequate training and are improperly recruited. Low qualifications and poor or no training reduces their value to well below what might be expected from the stated numbers

The overall conclusion is reached that, while stressing the importance of community management in organogram form, the required qualifications and skills of staff are not provided for. This suggests an underestimation of the difficulty and specialized skills necessary to succeed in achieving sustainability through community management.

The DWSS has recently undergone reorganization. It is recognized that reorganization is a difficult and lengthy process. Indeed, the organization of the department is generally appropriate and can be utilized as is. Thus recommendations are restricted to staffing and functions within the various sections. The following recommendations are made:

- At the centre, there are several key posts which remain vacant. In particular these are in the sections related to planning, community & NGO mobilization, sanitation and financial management. These vacancies have weakened key functions and need filling with staff of *appropriate* qualifications and experience.

- The importance of strength in community development skills and leadership are greatest at the Regional level yet the Planning, HRD, Community Development and NGO Mobilization Services Section is to be led by technical staff Similarly, both the environmental sanitation sub-section and the HRD, CD & NGO Mobilization sub-section have been staffed by technical personnel. Both these positions demand very strong communications skills (in adult education and social marketing) at the community level, such skills are extremely rare in technically trained and experienced staff

- the HR&CDS Section in the district DWSOs should be appropriately staffed and given clear responsibility and authority for its component of project development. In practice, there is little distinction made between the functions of the technical services and the HR&CDS sections.

- the HR&CDS section should be greatly strengthened in recognition of the enormous tasks ahead related to scheme handover, WUC preparation, hygiene education and sanitation In particular, the head of section should have demonstrated skills in communications and community development. This is rare in Asst. District engineers As the name suggests the HR&CDS sections need strong leadership in training and community development It would be highly desirable to import professional HRD and community development personnel to head these sections. It is recognised that this alternative may be impossible in view of hiring restrictions.... all staff would have to come from within DWSS, however none have the appropriate qualifications and experience.

- technician and O/S staff are appropriate within the HR&CDS section only if they also have demonstrated skills in communications and community development. Few of them have. It is recommended that great care be taken in filling these posts (although it is understood that nearly all of them have already been filled).

- Hygiene education and sanitation have proven extremely difficult to implement requiring special skills and training. The qualifications and calibre of "women workers" to fill these positions are too low to have any impact. Their working under an (technical) overseer who himself is responsible to an engineer will likely exacerbate the situation

6.2 Sector Policy

The DWSS is subject to many forces of change, some internal but also external The International Drinking Water and Sanitation Decade brought national focus to the sector and an new orientation towards lower cost technologies along with some pressures for community participation.

In 1987, water supply and sanitation came under DWSS at lead agency of the sector. External influence was felt following the Decade with the Global Consultation which affected the **Sector Review and Plan** of 1991. In addition, there have been over-riding influences coming from new internal policies of multi-party democracy and decentralization. Increased literacy and rural education has also increased demands from and accountability to the community

The **Directives** written in 1990 and adapted in 1991 have had important impacts on the sector, impacts which only now are taking hold. The Directives were put forward by the MHPP itself and resulted in policy and organizational changes within DWSS. DWSS was also responsible for the above mentioned Sector Review and Plan which attempted to set the direction and targets for this decade (although with little indication of how they were to be met)

The consequences of these documents have been substantial. However, it takes time for reorientation of a department, although it is clear that changes over the past two years have been substantial. These documents strongly influenced two subsequent documents which have and will continue to have even greater impact in years to come. These are **the Eighth Plan** (by NPC) and the "**Standards**" (supported by DWSS, bilaterals and UNICEF).

The Eighth Plan calls for even greater change in operational policy and for even stronger community orientation and resource mobilization The Standards attempt to describe how this can be accomplished in the field.

The one area where the Eighth Plan and the Sector Review can be faulted is in their attempts to set targets and establish sector plans. Both are ill-founded. In many ways, the setting of targets and the planning for coverage and numbers of schemes to be built were in conflict with the very approach they subscribed to.

- first, the idea of meeting physical targets should be secondary to the process of reorientation By their very nature *targets* are top down and supply driven. The target driven approach translates into budgets to be spent and schemes to be built specified time frames. In turn, this translates into sub-targets being imposed on District Engineers whose achievements are measured in funds spent and construction completed This naturally emphasises the product and not the process. Yet the success of the programme depends on sustainability and sustainability depends on the process.

- second, the baseline "coverage" on which the targets were based is seriously flawed. As described in the Section 1, coverage is not well defined and inconsistently used All the systems providing good water supply built by the private sector were excluded from baseline coverage figures. Thus the plans and targets lack meaning in that they are not based on reality.

Thus DWSS is indeed in a state of change Change is always difficult. The one grace is that DWSS policies and direction is now clear. The principal hurdles facing DWSS are now how these policies are to be put into practice. Some of the answers are described in Section 10 below, many others will come out of discussion and debate on this report

6.3 Standards

The MHPP Standards Vol. 1 to 12 (1993) evolved through practical experience in the field, and a number of senior national and international professionals. They provide detailed procedures at different stages of the project cycle to ensure sustainable community water supply services It sets out the activities to be done by the implementing agency and users' committee at planning, implementation and O&M phase. Beneficiaries groups are recognized as partners from the early stage of the project cycle to ensure long term operation and maintenance The Standards emphasis that the "ownership" of the scheme and "transparency" during planning & implementation are key factors for sustainability. Further, it recognises the crucial role of the beneficiary institution in the development of the water supply facilities. The Standards recommend a series of decentralized smaller schemes instead of a large centralized systems Flexible criteria are proposed to conform to regional, district and local requirements.

Implementation by DWSS

The implementing agency is responsible for support and over all co-ordination of the project activities The users are responsible formatting the request for the scheme, providing a contribution and managing implemen[illegible]n together with implementing agency. In addition, a users' committee is required to take full responsibility of operation and maintenance

The application of the Standards would not only contribute to quality of construction, it would also facilitate the process of construction It allows for the training course to be tailored to the social & technical requirements. Various technical forms including survey, design and estimates as well as administrative forms are presented in the Standards in effort to ensure smooth executing of projects in the field would help to execute work smoothly in the field.

Use by other Agencies

The Standards were developed primarily for DWSS as a support/partner in agency implementation Therefore, it does not strictly applied to other agencies such as NGOs. Most of the NGOs have their own guidelines. For those NGOs which do not have in-house technical and managerial expertise, they are encouraged to use the Standards.

Enforcement and Monitoring

The Standards are now approved by MHPP. To satisfy their requirements a number of social and health workers are required. In-house training both in software and technical aspects to all levels of personnel (VMW to District engineers) will be an integral part of the program. Unfortunately, field staff are not well motivated full work unless adequate TADA is paid

The Standards set out detailed procedures and terms of reference for maintenance staff This requires establishment of Maintenance Unit in all district offices. Likewise, Maintenance Unit cannot function without adequate budget. In addition collection of field data and management information at district office is crucial for successful O&M program.

Recommendations:

The following recommendation are made:

- the standards should be widely disseminated for use by government and non-government agencies alike. However, care should be taken in how they are applied. They should be advocated as guidelines rather than rules. Flexibility should be encouraged within the overall framework of the standards allowing for variation and further improvements in the field as well as adaptation to local conditions.

- provision should be made for continued support and major repairs of schemes under community management. This would include regular (6 monthly) visits by technical staff and reporting back on scheme status In addition budget should be set aside for major repairs for when they occur and held the regional level.

- the Standards do not include procedures for handover of existing schemes. They should now be extended along the lines described in Section 3 and Appendix D to cover this important task ahead.

- Likewise the standards do not include guidelines for hygiene education and sanitation promotion This is understandable as proven methodology is not yet available and "Standards" would be counterproductive.

6.4 Reporting and Management of Information

Regular reporting within DWSS is listed in Table 6.4.1. Further detail is provided in Appendix E and in the previous institutional setup report of December 26, 1993 The key problems faced by information management within DWSS are·

- the various demands for different kinds of information has led to a mix of reporting and information systems with some overlap and a general lack of compiling and analyzing the information in a format which is *specifically* designed and useful for management decisions At present there is little analysis of the information received, compilation of

the data remains just that: reports from the field are merely added together, summarized and forwarded to higher levels.

- reference is made to the report on financial management which highlights the point that whereas appropriate reporting *systems* may exist, they are of little benefit if they are not used properly

- although a major effort was undertaken to establish an effective MIS (through the MITS project) it was never consolidated and used properly. Consequently, three out of five subsystems have been disbanded. By not demanding appropriately formatted and analyzed information in timely fashion, management is not taking advantage of the potential the system has to offer it.

- fatigue has set in to the DWSOs. The MIS is operated as a one way information flow from district to centre. The DWSOs derive little, if any, direct benefit from the work they put into collecting the information. There is little incentive in regular reporting, this is reinforced by the lack of disciplinary measures taken against those failing to report

- management needs to become more aware of what the MIS has to offer (eg weekly updated Sector Status Data book) and how it can be used as a consistent and regular support in managing DWSS.

- over time field staff have changed and there is now confusion as to how to fill in forms and report correctly. Lacking feedback from the centre, the information has become incomplete and inaccurate.

- reporting formats are now based on progress in expenditures and do not relate to progress in meeting physical or "software" objectives or work plans. The new NPC formats need to be incorporated throughout. However, improved formatting alone will not solve the problems facing management and the MIS. The following recommendations are made as a start in upgrading the system and its use.

Table 6.4.1 Reports & Databases

	Reports & Databases	Data collection	Compilation/ Analysis	Use	Comments
1	**Annual District Reports** - list of completed, ongoing & surveyed projects, staffing, inventory and financial summaries	DWSOs	Summary report by DWSS Planning Section comprising completed projects and coverage status	DWSS, MHPP & NPC	- reporting from districts is irregular & incomplete
2	**Trimester, Eight Monthly & Annual Progress Reports** - project implementation report in NPC format	DWSOs	DWSS compilation for MHPP and NPC	MHPP and NPC	- reporting is irregular
3	**Project Inspection Reports** - progress reporting on ongoing projects with recommendations for problem resolution	DWSOs & Supervisors from outside	Summary report prepared	RDs & DWSS	- no more than 15% of projects are reported upon
4	**Project Handover Reports** - report on handover to WUCs	DWSOs		RDs & DWSS	
5	**Project Inventory System** - data on ongoing and completed projects, agencies, cost, coverage etc	DWSOs	Project listings and summary reports by monitoring section	DWSS, MHPP, NPC	-no NGO data since 1991 - reporting by DWSOs slow & incomplete
6	**Bimonthly Progress Monitoring System** - physical & financial progress of projects	DWSOs	Bimonthly summary reports are prepared	DWSS	- reporting by DWSOs slow - progress is reported in financial terms not in work completion
7	**Trimester Progress Monitoring & Program Budgeting System**	DWSOs		- established but disbanded	
8	**Stores Inventory System**	DWSS		- established but disbanded	
9	**Personnel Inventory System**	DWSOs		- established but disbanded	
10	**Monthly Financial Statement** - financial statements in standard forms and books specified by AGO	DWSOs	DTOs, Regional office & DWSS account section summarises financial status but no analysis	DWSS, FCGO	-routine reporting of expenditure in standard AGO formats No cost accounting analysis is done
11	**Internal/External Audit Reports** - information on project irregularities	FCGO/ DTO & AGO	- Audit reports by FCGO including the list of critical irregularities.	DWSS, MHPP	-many irregularities not resolved
12	**Monthly Expenditure Report** - budget & expenditure summary only	DWSOs, RDs & Project Offices	- Account section prepare summaries of total monthly expenditure	DWSS, MHPP	
13	**Personnel Information** - staffing, recruitments, promotion, retirement, transfer, training	Administra-tion section of DWSS & DWSOs	- Simple record keeping	MHPP, DWSS & RDs	manual, lacking systematization

Recommendations are that:

- the MIS should be reviewed from perspectives of both management and data collectors (DWSOs). Specific focus must be given to what the MIS can offer to both groups. These benefits should be assured through purposeful design of the MIS outputs directed at both management and DWSOs. It is crucial that all participants in the future MIS are involved in meaningful ways in the process of the system's redesign and upgrading The *process* of system upgrading needs to be specifically designed as being participatory.

- the above could be started by bringing together key DWSO staff, the Supervision & Monitoring Section and management to discuss needs, available capacities, constraints and possible resolutions of misunderstandings and ways by which the MIS can be upgraded and mobilized.

- any improvements in the MIS should include (1) use of NPC formatting and Trimester reporting which better reflect the actual physical progress achieved and requires it to be reported against budgets, (2) information other than physical and financial progress such as community support, training, sanitation and hygiene education, (3) reporting on performance monitoring providing greater quality control over DWSO activity, (4) indicators which will result in DWSO accountability to management and the user community, (5) discipline in the amount of information demanded from the field including careful selection of cost effective key indicators and parameters which are relevant, sensitive and objective. (6) avoidance of duplication and the use of the same or at least compatible formats for reporting (7) inclusion of coverage by NGOs and the private sector and (8) updating of project data since 1991.

- improvements to the MIS should be made on at a small scale (one or two districts) and built up/improved slowly with time and consideration given to feedback from the field and management.

- two way flow of information from district to centre and visa-versa needs to be incorporated into the MIS so that the districts have collated and analyzed information available for management within the DWSOs. This should also apply to the regional offices. Manual MIS systems should be established in DWSOs complimented by computerized MIS at the regional level.

- improved coordination between the Planning and the Monitoring sections and management to avoid duplication of work

- careful monitoring of *both* collection *and* use of information at district, regional and central levels and avoidance of data "hoarding" and restrictive access to information by computer operators.

- training, encouragement and enforcement of reporting in correct formats according to set schedules

- computer operators in the monitoring section have had no training in the database software This needs to be rectified as the MIS packages are under utilised and minor problems because whatever improvements are made to the system itself, it must be accompanied by training of both data collectors and management. Rules will have to be established which contain measures of enforcement to ensure that failure to report accurate and timely information is penalized. A system of spot checking should be built into the reporting and monitoring.

6.5 Monitoring and Evaluation

This section deals with information from the field and how it is collected and analyzed.

Accurate up-to-date information is essential for effective programme management at all levels district, region and centre. There is every reason to suspect that DWSS data bases comprises unreliable incomplete information. Management is having to rely on first hand reports from the field which can only be partial and unreliable in themselves. DWSS cannot possibly be run effectively on poor information. Monitoring, data collection, reporting, analysis and the management information system itself, all need resuscitation. There is a lot of work to do.

DWSS management information suffers from poor data collection and poor reporting. Apart from the Lumbini Zone surveys (which have not been entered into the MIS) there have been no comprehensive sector surveys in any districts. It is indeed unfortunate that despite all the effort gone into establishing monitoring and reporting systems, this project had to mount its own field survey (ref. Section 2) to acquire at least a basic understanding of sector status All prior information had been piecemeal and largely anecdotal

Another example. On attempting to determine basic information on scheme size, it was discovered that for schemes built after 1990, central DWSS (including the MIS) had no information. The DWSS staff member who flew out to the district to collect the information from the DWSO and regional office was met with a reluctance to release the information. At that, the information was difficult to extract from the records. The DWSO was only able to provide information on scheme sizes of 15 out of 19 that it had been responsible for constructing!

Monitoring and reporting has been in-house. The centre has had to rely on information solely provided by the DWSOs. Yet, there are other agencies which need to be involved and present a valuable opportunity as primary data sources and cross checking information. These are the DDCs, the VDCs and NGOs which are active in the sector. Including them in monitoring will not only aid coordination it will strengthen the sector's planning and development resources in the field where it is needed.

Evaluations have also focused on specific components of the programme (CHRDU and UNICEF programmes). While valuable they do not present the whole picture providing feedback to DWSS on its overall activity. They have also been carried out by evaluators who are within or have vested interests in the work/organization they are evaluating (with the exception of recent NPC assessments) Evaluations should be impartial but at the same time

engender the confidence of the programme being evaluated. This is possible through joint effort where the external evaluator works with the evaluated but at arms length

Recommendations are:

- that a thorough investigation be made of the present monitoring and management information system to identify what they offer in re-establishing a reliable up-to-date and active monitoring and MIS.

- that sector monitoring involve a much broader base of organizations thereby ensuring impartiality, transparency and availability of information to all who need it. These include DWSS, NPC, AGO, NWSC, DDCs, VDCs, WUCs, and the NGOs. DWSS should remain responsible however for coordination, collation, analysis and dissemination of information. However it should encourage and support the creation of other data bases for use at other levels and for other purposes .. such as by NPC and the districts as examples.

- that monitoring should include the work of all agencies involved, including the private sector.

- that the indicators used should be carefully chosen to be easy to collect, small in number and thereby cost effective. They should also be objective and verifiable,

- that the first task should be to establish baseline information on which good planning can be based. This would include reliable information on coverage, service levels and scheme status

- that monitoring should be performance oriented using indicators designed to easily determine effectiveness and efficiency of approaches, methods, agencies and their sub-units working in the sector

- that the AGO be encouraged to take up comprehensive monitoring of the sector by combining financial and performance audit in a way which includes production and process monitoring (in contrast to only financial),

- that DWSS take a lead role in establishing an integrated monitoring system with its sector partners. This will include.

  (a) the development of a responsive **Sector Database** including water supply *and* sanitation and hygiene education coverages, water resources, service levels and system status and management, district plans, and partner organization's programmes

  (b) supporting DDCs to establish their own **District Water Development Databases** which include district level information on population distributions, water sources, existing and planned schemes, sanitation and hygiene education, coverage, service levels, system status, and economic development patterns/plans.

(c) **DWSO Databases** which mirror the Sector Database but focus on the district and DWSO plans and operations, it being the key management information tool for the D Engr.

(d) **Sector Policy and Planning Information System** maintained by the NPC and concentrating on sector agencies and their programmes, macro-coverage data, multi-purpose use of water resources, performance and cost effectiveness

- the DWSS/CHRDU be responsible for establishing curricula and courses for strengthening DDC and VDC in district level water and sanitation monitoring and surveying. This would be backed by the DWSO training units' support to the DDC in carrying out the training (using the expertise and experience gained in DWSS/FINNIDA's surveys in the Lumbini Zone). Training would include district development planning, water resource use coordination and management, district and VDC level water and sanitation planning, data base management, annual workplan and budgeting, project selection, financing coordination and district level sector development monitoring and reporting.

- the DWSO would be responsible for the above training and for monitoring (in greater depth on its activities) and coordination of data collection, collation of information and reporting.

- the central DWSS/MIS be responsible for monitoring the collection of data, spot checking and quality control, data collation, computerization and analysis, preparation of summary analytical reports and reporting to management and back to districts.

- the NPC would be responsible for coordinating external evaluations, monitoring sector performance (including agency performance and analysis of cost effectiveness and efficiency, carrying out on-the-spot checks in assessing data reliability and agency performance, maintaining a data base for use in sector macro-planning.

6.6 Project Selection and Budgeting

Projects are normally requested through the VDC, DDC or direct to DWSS by a politician Fig. 6.6.1 presents a flow diagram of the request and selection procedure. Selection is an iterative process which is strongly influenced by available budgets The main agencies involved are the DWSS, DDC, MHPP, MOF and NPC. The following pertains to DWSS projects implemented through the DWSOs and not projects carried out by NGOs or DDCs

The DWSO prepares feasibility studies on projects which it selects from those submitted by the DDCs. As indicated in Fig 6.6.2 budget ceilings are given by DWSS by which DWSO prepares budget requests for new and ongoing projects (end of February). Budget request submissions are reviewed by DWSS and MHPP which forward them for consideration by NPC and MOF which request further revisions as necessary. By iteration a budget request is finalized and the DWSS prepares a detailed workplan and submits it to the DWSS which then seeks approval from the NPC for the combined DWSO workplans (end September) This procedure takes about nine months.

The process is intended to reflect District and VDC priorities, however, there are several contradictions which complicates the selection procedure.

- special instructions requiring feasibility studies can be made by members of the Parliament.

- the DWSO is not immune from the influence of DDC members and MPs during the short listing of feasibility studies. Likewise influences can come during selection of projects for implementation.

- the process of allocating budgets to the various DWSOs is also not immune.

- DDCs often request higher budgets than the approved budget which results in allocation of funds across a larger number of projects thereby reducing the allocations per project and increasing the time required for completion to several years.

- These influences work against the rational allocation of financial resources and proper planning procedures distorting the program and frequently making the community management impossible for DWSO to effect

The process of project selection and budgeting is faulted by its lack of transparency, supply driven nature, poor district planning, and lack of rational open criteria.

It is recommended that

- district level planning begin with (a) survey design including formats, indicators, workplans and manuals, (b) self selection of six districts for a pilot run (c) training of DWSO trainers then staff of the DDCs and VDCs, (d) survey and monitoring/supervision, and (e) joint preparation of district plans by DDC and DWSO staff.

- these plans would then form the basis of discussion and concensus reaching at the DDC and would include MPs with the objectives of hardship and identification and scheme prioritization The prioritization would follow a set of clearly identified and agreed upon criteria

- the prioritization would then form the basis of district water and sanitation development plans, which would be prepared and widely disseminated in the relevant districts

- the district plans would then form the basis of project selection by joint DDC and DWSO, selection of projects on receipt of budget ceilings and approvals.

The above procedure is recommended for discussion purposes and is intended as a pilot project which would be monitored and reviewed by a committee comprising representatives of the various agencies listed above.

Figure 6.6.1 Project Selection

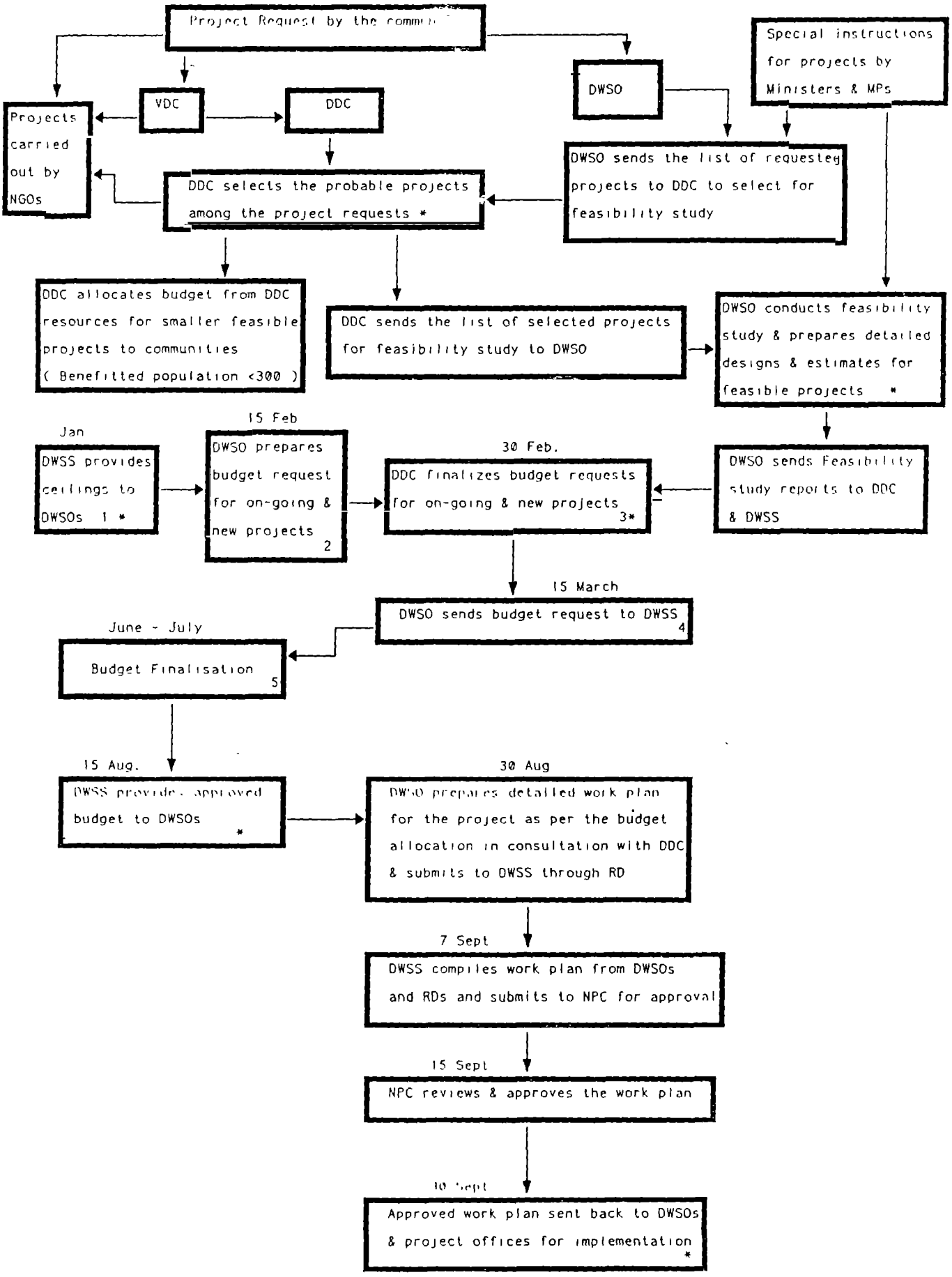
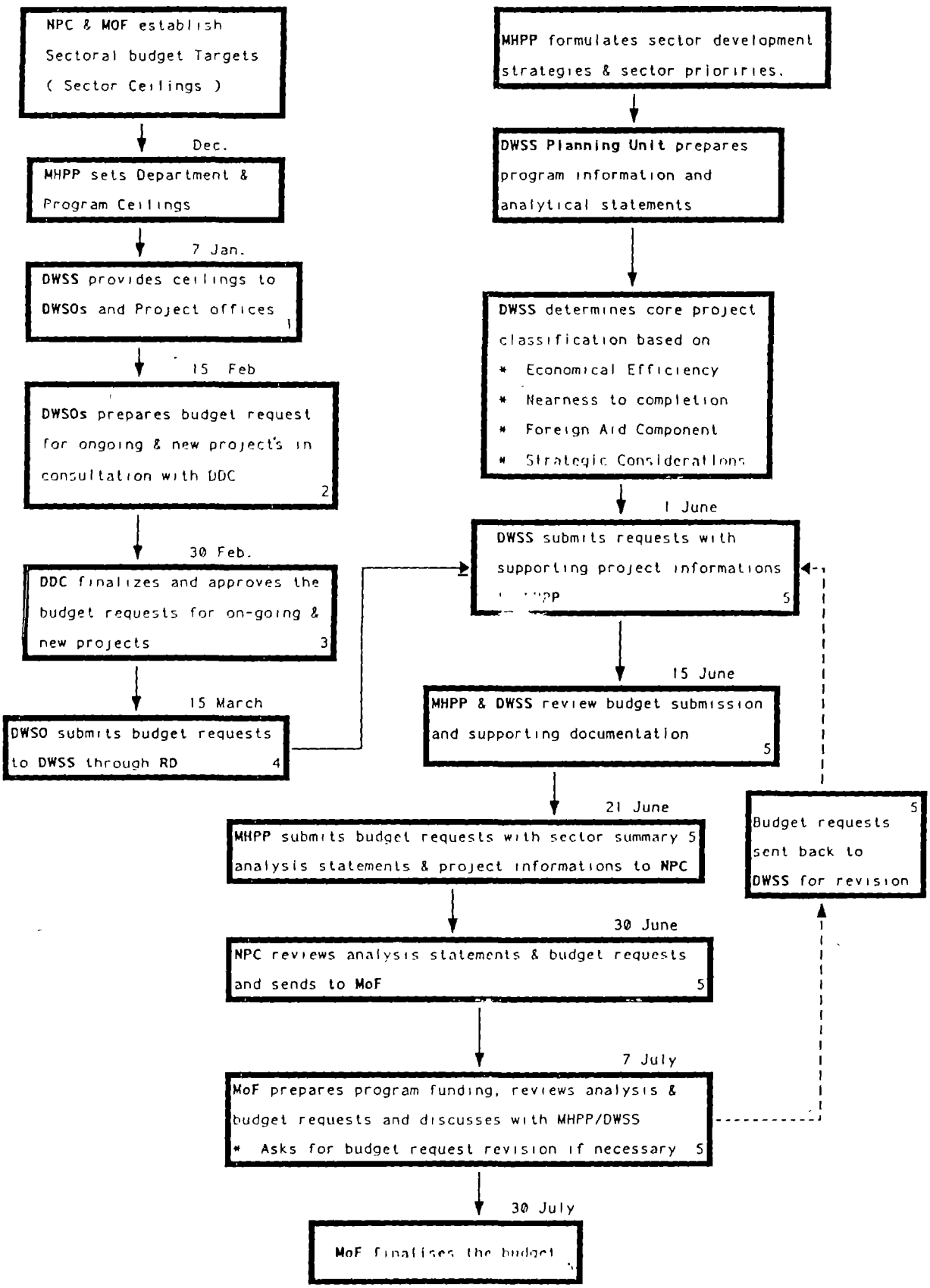


Figure 6.6.2 Budget Flow Diagram



6.7 Personnel Management

Personnel policy is uniform throughout the public service. Coming under the Ministry of Public Administration it is set by the Civil Service Regulations (2050) and Public Service Commission Regulations (PSC) under the Civil Service Act (2049)

Personnel Management is the responsibility of the Administration Section of the DWSS coming directly under the Sr. Administrative Officer for Personnel who is supported by ten head assistants and four assistants relating to each section. They are responsible for maintaining personnel records, performance evaluation administration, monitoring disciplinary action, postings. maintaining transfer records and coordinating volunteers from overseas Record maintenance is all manual.

The Ministry of Public Administration approves the number and type of temporary and permanent staff for each department. Recruitment is usually carried out by the PSC, through open competition including exam and interviews. This varies according to the Class of personnel It is the rule for the Non-gazetted Class IV but occurs in only 10% of cases of the Gazetted Class I officers who are normally promoted through internal evaluation from within the department

The quality of staff is affected by source of applicants which is usually externally influenced. The normal route into DWSS is not by open recruitment but by first joining as temporary staff and then being made permanent as vacancies arise. For example, with the resent re-organization (ref Section 6.1 above) the new permanent O/S and WSST posts in the HR&CDS sections were quickly filled by existing temporary staff yet the women workers' positions are still empty there being very few women in the department. The Public Service is likely to take six months to fill these posts.

Internal evaluation and promotion are carried out within DWSS. Annual personnel evaluation is based on a system of marking. Out of 100, 50 are based on performance, and 50 are for qualifications (15), geographical area of work relating to hardship (15) and seniority (20). The 50 for performance is determined by personal assessments of the supervising committee (10), the senior supervisor (16) and the immediate supervisor (24). Naturally, there is great scope for value judgement in such a system and staff are naturally highly effected by the process Marks for items other than performance are set by transparent criteria, the greatest influence over marks is in the personal judgement of the immediate supervisor who, in essence, has control over his subordinates' career. This is the cause of considerable concern in many cases.

Salaries are well below market value in the private sector. Yet, unemployment is high and announcement of non-gazetted class vacancy is met by tens of thousands of applications Government is still a primary employer although since multi-party democracy its status has reduced. The principal reason for demand is security. Firing is extremely rare, retirement is set at age 58. Benefits beyond salary are substantial. For example, an overseer of ten years employment enjoys an additional month of salary each year, local allowance depending on area of employment, medical expenses, accident insurance, pension, provident fund, and accidental death insurance These amount to some 70% value on top of salaries apart from out-of-post

allowances (TA/DAs). In addition there are chances at further training and substantial leave allowances (casual, annual, and sick plus statutory holidays amounting to 30 days each year a further mourning, 15 and maternity 60 days are possible). Benefits and conditions are very attractive but salaries are low giving rise to moonlighting and other forms of enumeration enhancement.

Rewards and thereby motivation are not directly correlated to productivity.

Formal disciplinary action is rare. Postponement of salary increments occurs in under 5% of cases, demotion is possible but very rare and firing has not occurred in the past five years Relocation to remoter areas is the most common form of castigation. Transfers are made in over 20% of posts each year and can be made with no reference to performance. The threat of transfer to a hardship area creates motivation for higher productivity. It is, however a negative incentive. Not being transparent it can be manipulated and is a cause of stress and concern for many staff.

There is no policy for career development. Training is possible and available, particularly for permanent staff but purposeful development along career paths is not a part of personnel management.

Coming under civil service regulations there is little scope for improvement in the above however recommendations are made for further investigation into ways by which changes can be made in the following

- records keeping by personnel management, making it a part of the management information system,
- the process of recruitment, improving the relevance and calibre of staff gaining access to permanent positions,
- performance evaluation, making it less dependant on value judgement,
- enumeration, incentives and rewards making then more related to performance and productivity. TA/DAs are of particular concern in this regard.
- the system of transfer to provide greater continuity in posts and avoidance of manipulation, and
- career path development to create a programme or at least a system to monitor and encourage career path development.

7. STAFFING

Tables 7.1 and 7 2 list the total staffing of DWSS by class of staff and location. Ceilings have been set on permanent and temporary staff. The DWSS has over 2000 permanent and nearly 3000 temporary staff totalling over 5000. The bulk is in the non-gazetted staff category and peon/watchmen. Only 2% of staff are at the centre and 11% in regional offices. 85% work out of the 75 district offices.

Table 7.1 Temporary and Permanent Sanctioned Posts in DWSS

Staff	Payment				Temporary				Total		
	Adm	Tec	Total	Fem	Adm	Tec	Total	Fem	Adm	Tec	Total
Gaz Off I		8	8			2	2			10	10
Gaz Off II	2	78	80	1					2	78	80
Gaz Off. III	9	178	187	2	2	3	5		11	181	192
Sup Staff I*	175	488	663	7	25	32	57		200	520	720
Sup Staff II**	86	452	538	2	117	986	1103		203	12/38	1641
Sup Staff III***		225	225	4	11	538	549		11	763	774
Typist	84		84	31	9		9		93		93
Peons/ Watchman	315		315		1231		1231		1546		1546
Driver	64		64		9		9		73		73
Total	735	1429	2164	47	1404	1561	2965		2139	2990	5129

* overseers, drillers, nayab subba, computer operator, draughtperson
** Administrative support staff, water supply and sanitation technician
*** Water supply and sanitation technicians

Table 7.2 Geographic Distribution of DWSS Staff

Office	Permanent		Temporary		Total		Grand Total
	Technical	Admin	Technical	Admin.	Technical	Admin	
Central	49	48			49	48	97
Regional	45	55	376	103	421	158	579
District	1335	632	112	1255	2457	1887	4344
Project Offices			77	32	77	32	109
Total	1429	735	1575	1390	3004	2125	5129

There are very few female staff in management positions. The one female officer at S D. Engr level works in the Appropriate Technology Development Section. The other two are assistant engineers. Most of the non-gazetted female staff are draghtspersons or typists It is often said that this is a women's sector and correctly so. DWSS staffing pattern reflects the opposite in the extreme. This has a direct bearing on community liaison, planning and design of schemes, hygiene and sanitation and of course sustainability, the crucial criterion of programme success.

The importance of communication and community development skills in community based programmes cannot be understated. There is one post available for a sociologist at the centre It was filled by a sociologist for a while he but resigned. In the regional offices there are positions for sociologists but these have not been filled. The lack of communications and community development skills within DWSS has had an over-riding impact on the quality and effectiveness of programming, on the sustainability of schemes and thereby on the success of the DWSS programme as a whole

DWSS has been staffed by engineers and technicians. With the exception of administrative, all posts have been interpreted as needing engineers with little attention given to their tasks and requisite qualifications. Thus, the computerised Monitoring Section is staffed entirely by engineers (without programming skills), likewise in the Community & NGO Mobilization Section, the Sanitation Section, the Planning Section and the HRD (CHRDU) Section. While engineers and technicians are adaptable, there comes a point where it has to be recognized that many if not most of the tasks required by these sections demand multi-disciplinary skills And that staffing should reflect the nature of the tasks carried out.

Many of the key positions in central DWSS are vacant. These include DDG (Construction), Head of the Community & NGO Section, Head of Administration Section, and Head of Financial Administration. There is only one DWSS staff in each of the Sanitation and Community/NGO Sections. These vacancies have stressed senior management and weakened important resources at the centre which should be supporting the field programme

Table 7.3 lists the staff available at Type B&C district offices which are the most common type. On average, technicians constitute 70% of substantive (non-administrative) technical staff. At present, much of the fieldwork (and thereby the programme as a whole) depends on the quality of overseers (O/S) and technicians (WSSTs). Unfortunately, recruitment practices for these staff are deficient and their calibre varies enormously Training of technicians has been attempted by several programmes which varied greatly in quality DWSS training supported by UNICEF, HELVETAS and FINNIDA has produced many good technicians who, when provided adequate management and TADA support, function well in the field. Unfortunately these are in the minority. The importance and difficulty in achieving effective community liaison and support cannot be over-stated, yet it continues to be under-emphasised. This is an area which needs far greater effort and skill in developing extension workers competent in communications and motivation at the community level.

Table 7.3 Existing Non-administrative Staff in the Typical District (Types B and C)

Category	Permanent	Temporary		Total
		Average	Range	
District Engineer	1			1
Assistant Engineers	2			2
Overseers	6		0 - 1	6
Technicians	6	15	4 - 50	21
Sanitation Women Workers	0	-	-	0

It is recognised that government (and DWSS within it) is undergoing change as the policy of decentralization is put into practice. DWSS is particularly affected as decentralization means a devolution of responsibility *and* authority to the districts and the community. By policy and standards, the community is now expected to play a decisive role in all stages of scheme development which implies its active and meaningful participation in everything from planning to ownership of the schemes. These are difficult concepts for departments which were originally very centralized to grasp and put into practice. Important changes are underway. Achievements are commendable, but the process is understandably slow and always difficult. Considerations must now go well beyond organizational and regulations changes and reach deep into the attitudes and social orientation of staff.

Recommendations are as follows:

- there is an outstanding need for social science skills (in particular communications and community development) at all levels of DWSS. These are urgently required and cannot be acquired only by providing training to technicians and engineers These skills should be brought in by whatever means possible. This will be the subject of review and debate by this project over the coming two months. If a way not be found, the prognosis is very

dim, not only for handover of existing schemes but also for the continued development of new schemes.

- likewise, women are also needed to influence policy, operational strategy and programming itself. They are essential for success in such programmes as DWSS is attempting. As in the case of social science skills, ways by which they can be quickly brought into DWSS at all levels must be found.

- DWSS is shouldering an enormous responsibility for O&M of existing schemes to which half of its staff is devoted. Handover of at least the most resource consumptive projects should now become top priority. Removing this burden from DWSS would have a major beneficial impact at district level by releasing the pressure on staff making (temporary) staff more available for development work. The handover process itself will take time, however and demand considerable software and management skills to effect.

- it has often been said that DWSS should now become a supporting rather than implementing agency. Correct, but easier said than done. A fuller appreciation of what this means is required at the regional and district levels. On completion of this project and development of the seven year plan, workshops are recommended for all officers to clarify its implications and create a greater understanding and acceptance of decentralization in general and community management in particular.

- renewed efforts at creating a clear understanding of the software components is needed at all levels of DWSS. CHRDU plans and efforts at training are recognized and are in the right direction but new approaches and even greater effort will be required to reach DWSS 5000 staff. A new programme of orientation and training is recommended which will reach all staff in a way which will provide clarity, change attitudes and create an appreciation for the importance of and requirements for community strengthening.

These recommendations are general in nature but reflect the priority needs of the department, further detail and quantification will be made in the next report subject to consensus being reached on the above and further detail of requirements being specified by the 7-year plan.

8. HUMAN RESOURCES DEVELOPMENT

The Central Human Resources Development Unit has become the focus for training in this sector although major achievements are being made in both quality and quantity of trainees in the bilaterally supported DWSS programmes (HELVETAS and FINNIDA in particular). The question of HRD is an important and complex one. This project's analysis is proceeding. At this stage only generalized comment and recommendations are made on the subject. Fuller analysis will enable sharper focus in the next report.

The CHRDU derived of the Training of Manpower Project (1983-87). During its first phase up to 1987 it trained some 250 technicians and engineers in technical subjects such as plumbing, W&S planning and engineering orientation. In its second phase (1988-92) it trained some 100 trainees per year who were mostly plumbers, overseers and pump operators. Non-technical training related to courses in management development and procurement.

The scope and methods of CHRDU have expanded since the latter half of 1993 when a three tiered (central, regional and district) approach was initiated. Its trainers include its director (Sr. Div. Engineer), three instructors (Engineers) and three Asst. Instructors (Overseers). Regional training foci are to be staffed within the Planning, HRD, and NGO Mobilization Services Section by a Sociologist (community development) and Asst. Engineer (sanitation) Training will be the responsibility of the Users' Training Sub-section in each DWSO. These regional and district foci are at their initial staffing and mobilization stages.

There have however been some modest beginnings in training at district level through ADBIII with project consultants being responsible for orientation training (at time of writing). The CHRDU conducted several training of trainers courses during 1992 for 50 WSSTs and 50 Overseers, primarily in the principles of teaching although the course included sessions on technology and orientation in CHRDUs training programme at district level. CHRDU is in the process of developing training manuals and materials.

The CHRDU has proposed funding from UNDP and ADBIII for an expanded programme and facilities. Among the objectives of the expansion are its becoming technically self-sustaining, fully institutionalized and competent in manpower planning and training. The proposal is seen as a major opportunity for development of CHRDU if operationalized correctly.

Comments are as follows:

- the most crucial need in DWSS is for multi-disciplinary skills at all levels, to cope with the new policy and changing operational strategies, yet CHRDU is staffed entirely by technical personnel. Introduction of new skills must begin with the trainers. Professionals in communications and community development are urgently needed to join CHRDU at senior management levels where they can have the appropriate impact. They are also needed in the Regions although with higher qualifications than proposed for the (regionally based) sociologists,

- needs assessment is a central element of course and curricula development. Assessment of needs from the field perspective is recommended. For example, it is apparent that training courses are now far too short to allow for proper training of technicians, many of whom come with minimal education,

- the CHRDU could do well to take leadership in staff orientation in community management. It is clear that community based programming is not well understood (nor appreciated) by the majority of mid and lower DWSS staff,

- a review of training materials and manuals suggests that they would be difficult for the technician or overseer to digest. A stronger task orientation would limit technical training to only the basic appropriate technology,

- competence in communication will be crucial to the success of the handover programme and community based project yet PRA or PROWWESS participatory methodology has been given only a three day course at the centre. Likewise communication skills are given very low priority in technicians' courses which are largely technical when they are to be the principal liaison or "communicator" with the Water User Committees.

- updated manpower assessments and planning will be required to respond to the changing needs of the sector.

- close liaison with NGOs and other sector agencies for frequent exchange of experience and expertise is recommended. The format could be workshops or training within NGOs and the private sector. The CHRDU offers an ideal medium for such exchanges between DWSS and organizations working in the sector. In particular the CHRDU should take advantage of the capabilities in training which the NGOs and bilaterals projects have in this sector.

- opportunities exist for CHRDU to play a central role in supporting the private sector through technical training such as will be required by the Handpump Credit Pilot Project.

- strong emphasis should be placed on in-community training for both DWSS staff and community members.

- with all the demands for training, care should be taken that the CHRDU does not get spread too thinly. There is a natural tendency to respond to all needs, resulting in overly ambitious targets and unrealistic expectations.

- frequent review of trained staff and field monitoring of the use of their new skills would go a long way to sharpening course curricula in refining them specifically to tasks.

9. DWSS FINANCIAL MANAGEMENT AND COST RECOVERY SYSTEMS

9.1 Assessment of DWSS Financial Management System

The assessment of DWSS financial management system was carried out and the findings were presented in the earlier Report on Institutional Framework of December 1993. The relevant sections are reproduced below.

The scope of HMGN's system of financial management is broad, encompassing virtually all government operations. The system proscribes duties, responsibilities, rules and procedures for all functions involved with government finance, including those that deal with resource allocation, budgeting, central bank and treasury management and control, revenue collection, funds disbursement, procurement, asset management, accounting and auditing.

HMGN's financial systems are Constitutionally mandated and administered by the Cabinet under an Act of Parliament, Section 2 of the Administrative Procedure Regulation Act (1956). The current rules, Fiscal Administration Rules 2042 (1986), were approved by the Cabinet and amended twice; once by the Fiscal Administration (First Amendment) Rules, 1991 (February, 1992); and recently by Fiscal Administration (Second Amendment) Rules, 1993 (August, 1993). Procedures covered under the amended Rules include

- Preparation of the Budget
- Budget Release and Disbursement of Government Funds
- Custody of Government Property
- Procurement
- Auction
- Wage Rates

The Rules are supplemented by other, more detailed procedures, including

- MOF Budget Preparation and Guidelines
- FCGO Accounting, Funds Control, and Budget Disbursement
- DTO Accounting, Budget Release, Revenue and Expenditure Reporting, and Internal Audit
- AGO External Audit and Forms Control
- Nepal Rastra Bank Consolidated and Special Account Operating
- Line Agency Implementation, Accounting, Reporting and Monitoring

Summary of Conclusions and Recommendations

The lack of development success in Nepal in the past twenty years often is attributed largely to the inadequacies of government financial systems. Many of the government's financial procedures have long been the subject of criticism for being overly complex, insufficiently comprehensive, unsuited to development administration, ineffective for financial control, etc., and improvements continue to be proposed and implemented. Criticism is also levelled at weakness in provisions available to assign and enforce accountability for the use of government resources, but this serious deficiency has yet to be adequately addressed. It is not practical, nor

is it appropriate to attempt a complete, sudden overhaul of any government's financial systems Financial reforms should be made gradually in a process that evolves at a manageable pace as is being attempted in Nepal. It makes little sense, however, to pursue improvements in HMGN financial management procedures while ignoring the lack of an institutional framework to enforce existing procedures.

The assessment made in the course of this project indicates that, despite deficiencies that may exist, *the government's financial systems do not pose a major problem to the administration of Nepal's development program*, either for DWSS or, in fact, any other line agency. The amended *regulations* now seem to be adequate, despite the fact that many project field offices where they apply are in extremely remote locations where access and communications are difficult, staff and training is insufficient, incentives are virtually nonexistent and administrative budgets completely inadequate. The conclusions and recommendations that resulted from this assessment of DWSS financial management systems can be summarized as follows:

- The *Accounts Section* produces the required reports on the financial condition of project offices. The key problem here is that these reports are not produced and delivered to management in time and in a form to facilitate operating decisions. Field office accountants supplied by the DTO are not sufficiently trained or motivated to deliver required accounts on schedule.

Recommendation: Field office accounting staff should be upgraded through training and assigned permanently to DWSS. Field office accounting should be computerized at the Regional Office level for prompt delivery to DWSS.

- The *Construction Supervision Section* reports on project implementation progress and quality control problems and solutions. The problem here is that no more than 10 to 15% of the projects are covered by inspection reports despite the fact that it is mandatory that inspection reports are made twice a year for each project.

Recommendation: DWSS should strongly enforce existing procedures for quality control inspection and reporting and should maintain a list of offices that fail to report for follow-up disciplinary action.

- The *Planning Section* coordinates budget preparation, budget allocation and work plan preparation. The problem here is that the budget allocation process is manually done and requires up to two months to complete.

Recommendation: The preparation and allocation of budgets and the preparation and monitoring of work plans should be computerized to speed the completion of these vital planning activities.

- The *Monitoring Unit* routinely collects and reports data on the inventory of projects and bi-monthly physical and financial implementation progress Again, the problem is that reporting from the field is slow and incomplete

Recommendation: The timely reporting of physical and financial implementation progress should be made mandatory and a system developed to facilitate management follow-up when necessary. The existing bi-monthly format should be revised to conform to the new NPC work plan format.

- *Accountant Training and Professionalism* - Donors urgently need to recognize the major problem in Nepal caused by serious deficiencies in accounting *practices*. This has been addressed in countries such as Indonesia by providing large scale assistance to train accountants and modernize accounting rules and practice so as to develop professionalism in the practice of accounting. This vital area of assistance has been neglected in Nepal far too long.

Recommendation: Donors need to address the problems of development administration in Nepal that are due to serious deficiencies in training and professionalism in the practice of accounting by making a substantial investment to remedy these deficiencies.

The problem is not with the financial management systems. The problem is with the implementation of these systems. In the absence of adequate institutional arrangements for the enforcement of existing financial rules, implementation has become an elaborate, costly ritual. For example, the audit system regularly reports "irregularities" in the expenditure of budgeted funds. Rules provide for clearance of irregularities within a specified time. They are regularly reported up each level of management to the Secretary, which is the key repository level of fiscal accountability in a Ministry. They are then reported to His Majesty the King, and to Parliament. Finally, they are remanded back to the Ministry, then to the Department, and finally to the field offices for action. The list of irregularities continues to accumulate and the whole process is repeated. In DWSS the accumulated uncleared irregularities over the past 10 years now amounts to more than NRs. 780 million. It should be noted that the term "irregularities" should not be seen as synonymous with misappropriation of funds, although this may be the case in some instances.

This is only one example of how the whole system has become ritualized. Ritualization occurs when *any* procedure is followed simply because it exists and where the results are not noticeably affected whether it is followed or not. A major effect of ritualized procedures, aside from the excessive cost burden they impose, is that they destroy the moral of personnel involved in their implementation, thereby creating widespread cynicism both inside and outside the government. While there are many in government who do have a genuine interest in reform, opposing forces are sufficient to frustrate and discourage all meaningful attempts to bring it about.

- *Accountability and Institutional Reform* - Unless and until the problems that result from of the lack of accountability and the lack of effective institutional support for the enforcement of financial procedures are brought to light, addressed and resolved at the highest levels of government and donor agencies, government procedures, however modern and efficient, cannot be effectively implemented. Without enforcement of accountability, development in Nepal will continue to fail to provide its intended benefits.

Recommendation: HMGN, in cooperation with the Donors, urgently need to address institutional deficiencies for the purpose of strengthening policy, legislation and enforcement agencies required to introduce and enforce accountability for the use of government's scarce development resources.

The only alternative to effective institutional reform is to limit government intervention in development administration to policy formulation, strategic planning and monitoring, and to shift the entire focus of development finance and implementation to programs managed solely by the intended beneficiaries. A small number of donor agencies already appear to have reached this conclusion.

9.2 DWSS Municipal and Large Scheme Tariffs and Cost Recovery

What people pay for

Socially and religiously, water has been treated as a commodity to be provided free of cost. People have been constructing taps and wells from time immemorable to provide drinking water. Most people in Nepal still adhere to the concept that water should be free. The politicians themselves, support the provision of free or at least nearly free water. These are the reasons for delays in the revision of DWSS 1975 tariff which has been under consideration of the cabinet for the last two years.

In the DWSS municipalities the rate was revised in 1983 to NWSC rate of 1981 without amendment of Water Tariff Rules. The monthly rates are Rs 7 for metered and Rs 13 for unmetered connections. The tariff rate of DWSS 1975 is applicable in most semi-urban areas which is Rs 5 per month. The current NWSC minimum rates are Rs 20 for metered and Rs 75 for unmetered connections.

People have been getting water from a variety of sources when public water supplies fail them. The flourishing tanker service in Kathmandu is one example. In some urban areas people hire porters for fetching water. Tanker service in Kathmandu and porters in water-short areas like Tansen and Kakarbhitta charge from 60 to 100 Rs/m^3. This gives an indication of affordability and willingness to pay for water. People are willing to pay private sector rates of 50 to 80 times higher than DWSS rates.

Affordability

Affordability to pay for water depends on the household income. The Multi Purpose Household Budget Survey 1985 (MPHBS) of Nepal Rastra Bank has the latest national household income data. Rural and urban incomes from the MPHBS has been brought to 1994 price using the GDP deflator published in the Economic Survey (1993).

The current level of income in table 9.2.1 shows that average **bottom decile** rural people can afford monthly fee of Rs 36 (cash and/or kind) of total income at 3% of income. In the case of urban people it is Rs 57 of total income. This level of income suggests that people can afford a lot more than the current DWSS tariff asks for It is usual for households in towns and

municipalities on DWSS managed systems to be charged only Rs 7 per month for metered and Rs 13 per month for unmetered connections. Poor people who cannot afford a private connection in the urban and semi-urban areas have access to the Public Stand Posts (PSP).

Table 9.2.1 Bottom Decile Monthly Household Income

	1985 Income in Rs		1994 Income in Rs		3% of Income in Rs	
Rural	Cash	Total	Cash	Total	Cash	Total
Mountain	155	600	386	1494	12	45
Hill	95	400	236	996	7	30
Terai	175	525	436	1307	13	39
Average	140	475	349	1182	11	36
Urban						
Hill	490	770	1220	1917	37	58
Terai	420	700	1046	1743	31	52
Average	445	685	1108	1705	33	57

Management Options

At present there are three formal institutions ie NWSC, DWSS and WUC and the private sector managing water supply systems in Nepal. NWSC operates water supply systems in 13 municipalities. Of the remaining 23 municipalities, 22 are operated by DWSS and one by a WUC. In the semi-urban areas most of them are operated by DWSS. The number of systems in semi-urban areas, currently classified as rural, are comparable to the Municipal systems in size and complexity .

NWSC's past performance in managing water supply systems is not very encouraging Basically NWSC functions as a government bureaucracy. It has indicated its willingness to take over some of DWSS more profitable systems at this time. The option of handing DWSS schemes over to NWSC should include a careful analysis of NWSC capacities to undertake management of more systems. The ultimate objective should be the transfer of responsibilities for scheme management to capable management concerns which are as close and accountable to the user population as possible. Direct transfer from DWSS to municipal government, local government, user groups or the private sector is possible and would be preferred to going through an intermediary stage of NWSC management.

Discussions were held with the Mayor of Tribhuvan Nagar and Chairman of the Shankar Nagar WUC to take over the systems. It was encouraging to learn that they are positive to this concept if certain conditions like technical support, rehabilitation, increase in tariff are fulfilled before handover.

Collection and Enforcement

Collection of tariffs does not seem to be a problem. This is largely because of the very low rates. The present tariff is so low that unmetered customers are known to pay the entire year's rates in advance ! Penalty for late payment is charged after a grace period of 6 months at 10% to 20% (DWSS 1975 tariff) and 10% to 100% (NWSC 1981 tariff). Water supply is disconnected after the grace period. In practice, penalties and disconnections are rare.

Legal Provisions

Water tariff rules of DWSS are framed under Section 2 of Administrative Procedures (Regularisation) Act 2013 (1956). These rules are approved at Cabinet level. Currently applied Water Tariff (Collection) Rules 2032 were passed in 1975. The main sections of the rules are tariff rates, penalty for late payment, disconnection of supply, transfer of ownership, connection charge, write off of bad debt. There has been no difficulty with application of these rules in view of the low level of tariff rates. The principal difficulty is that they attempt to apply a uniform tariff throughout the country. When and if the tariffs are raised to NWSC, the uniform rate policy will result in significant distortions. The best way around this is the early transfer of schemes to municipalities and local groups who are not bound by central tariff regulations.

9.3 Financial Management of DWSS Municipal and Large Systems

HMG financial management procedures are followed in the municipal and large systems. This is discussed in length in the previous Report on Institutional Framework's Appendix B The revenue accounting system not explained in that report is addressed in this section.

The revenue accounting system is a separate sub-system. The prescribed forms used for water supply are Cash Receipt, Customers Account, Daily Income and Revenue Details Account. Collection of revenue is deposited in the consolidated fund of the central treasury. There is no linkage of revenue generation and budget allocation for O&M

The use of the single budget for the whole district which does not separate out construction and O&M costs of completed systems is the major defect of the financial management of municipal and large systems. Further no provision is made for the analysis of operations of completed schemes as the District's O&M budget is listed as a single lump sum. To analyze scheme operations it would be necessary to collate and analyze income and expenses related to each system.

This was done in analyzing the financial management and status of three large DWSS systems as presented in the following table.

Table 9.3.1 Case Studies of DWSS Large Systems

(Amount in Rs)

	Gularia (pumped)	Tribhuvan Nagar (gravity)	Shankar Nagar (pumped)
Population Served	3,000	12,000	13,000
Private Connections			
Metered	0	800	633
Unmetered	412	490	0
Public Stand Posts	19	90	76
Revenue	26,000	103,000	163,000
Expenditure			
Salaries	144,300	567,600	204,000
Electricity	102,000	0	180,000
Maintenance	50,000	150,000	100,000
Total Expenditure	296,300	717,600	484,000
Deficit	270,230	614,600	321,000

The data shows that Shankar Nagar WUC/DWSS managed system is operating more efficiently than the other two systems. To break even, Shankar Nagar tariffs would have to be raised 3 times whereas Gularia and Trubhuvan Nagar rates would need raising 10 and 6 times respectively. This does not include office overhead costs and depreciation. Tribhuvan Nagar metering was recently started and metered tariff rates have not yet been introduced.

9.4 Recommendations for Municipal and Large Systems

Under DWSS Management

Cost Recovery

- The present tariff rates should be revised to at least NWSC levels for all municipal and, pumped and large schemes.

- Future tariff structure and rates should take into account all direct costs, overheads, depreciation and surplus for future expansion and improvement of the system. Rates should be raised as quickly as possible to cover these costs.

- Utilities commission should be created and given approval authority over water rates which should pertain to individual systems costs and financial status.

- In semi-urban large schemes, private connections should be encouraged and the number of PSPs should be reduced.

- All private connections should be metered, and rates structured to limit water wastage.

- Public Stand Post charges should be collected by the DWSS from the Municipality or the WUC.

Financial Management

- Budgets and accounting of large completed schemes should be separated from the total district budget.

- Adequate and realistic budget provisions should be made for each large completed scheme.

- Income and expenditure statements for each system should be prepared for monitoring each systems financial position.

- Financial statements should form part of the MIS of DWSS.

Outside DWSS Management

Cost Recovery

- As in the DWSS managed schemes, future tariff structure and rates should take into account all direct costs, overheads, depreciation and surplus for future expansion and improvement of the system.

- All private connections should be metered.
- In semi-urban large schemes, private connections should be encouraged and the number of PSPs should be reduced.

- Public Stand Post charges should be collected from the users.

Financial Management

- Simple accounting systems should be developed and incorporated into training courses and manuals to assist in the transfer of schemes from DWSS to local groups.

- Income and expenditure statements should be prepared for monitoring the financial position of the system.

- The accounting records should be kept transparent and available to the community.

- Accounts should be verified by an independent accountant every year.

9.5 Cost Recovery for Rural Systems

What people pay for

The analysis of affordability based on monthly income of people is discussed in section 9.2 above. It is estimated that average **bottom decile** rural families could afford 36 Rs/month in cash or kind based on 3% of total income However, the actual willingness and affordability can only be determined by trials and surveys of actual practices. For a start most villagers are at the edge or outside of the market economy. However it is generally felt that cash payment of Rs 11 per household per month (ref Table 9.2.1) is not unrealistic and would be adequate for normal O&M of gravity schemes covering 50 households or more.

NGO Prerequisites

One of the prerequisites of the better NGO operated water supply schemes is cost recovery for part of capital and all O&M costs. Willingness of people to contribute towards capital and O&M costs is one of the common project selection criteria used . Success stories of completed NGO schemes is evidence that people are willing and can afford to pay a substantial portion of capital and all O&M costs. Our field review substantiates that the average capital cost recovery of different NGOs varies from 20% to 50% in gravity schemes and 10% to 15% in tubewells. These recoveries have also been achieved by DWSS but less consistently.

DWSS Directives and Standards

The Ministry of Housing and Physical Planning (MHPP) issued Directives for the Construction and Management of Water Supply Projects in 1991. According to the Directives, rural water supply systems should be constructed through community mobilization but they do not specify the amount. The policy of the government spelled out in the Eighth Plan is to implement rural water supply schemes with community participation and recover to at least 10 percent of capital costs and to manage and operate them by the communities.

Charges and Mechanisms

Up front contribution in the Maintenance Fund is a common practice used by NGOs, WUCs and DWSS bilateral projects. Generation of this fund shows the willingness of the community to undertake the system and to create O&M costs from interest earned. The amount of contribution varies from 300 to 1,000 Rs/tap depending upon the type of scheme. Moreover, community contributes towards monthly salary of VMW and ad hoc maintenance expenses. The VMW receives salary of about 50 to 550 Rs/mo depending upon the size of the scheme and the community. In most communities, very poor families are forgiven from monthly O&M costs.

Management of Cost Recovery by WUCs

In some NGO and bilateral gravity schemes the salary of the VMW is paid either in cash or kind. The VMW himself collects monthly fees from the users. Maintenance costs for spares are paid from the Maintenance Fund or raised on ad hoc basis. Problem in raising monthly fees is due to the lack of training of WUC in financial administration and/or non-existence of effective WUCs. In the case of schemes constructed by DWSS and not handed over to WUC, DWSS is responsible for O&M.

O&M costs vary in different types of schemes. Maintenance costs of shallow tubewells is lower compared to gravity and deep tubewells and are normally paid by the household closest to the installation. The field review results show that in most WUC gravity systems O&M costs are recovered on ad hoc basis except in the case of VMW salary.

Recommendations for Rural Cost Recovery

- As far as possible, financial management and rates should be left to the community to design and apply. The support agency should be responsible for improving them only when it is apparent that they will not suffice to achieve financial viability.
- Project selection criteria should depend upon willingness to contribute towards capital costs and all O&M costs.
- Contributions towards the Maintenance Fund should be made compulsory.
- Maintenance Fund account should be operated jointly by two members of the WUC.
- DWSS should not contribute to fuel costs.
- WUC members should be provided basic training in book-keeping.
- Accounting and reporting systems of WUC must be transparent.
- The accounts should be verified by an independent person once a year.

10. INSTITUTIONAL SET-UP: DWSS' ROLES AND RESPONSIBILITIES

As a follow-up to the Institutional Workshop held on 30 December 1993, a meeting was held on January 31 attended by senior management of DWSS to reach concensus on the several issues put forward by the Institutional Set-up Report of 27 December. The following is a summary of the conclusions reached at that meeting. They include the agreed upon institutional roles of DWSS.

DWSS' role as lead agency of the sector was recognized. There are many forms of leadership In view of changes in policy and operational strategies in government, the DWSS style of leadership would best be decentralized and supportive aimed at institutional resource mobilization rather than being centralized and attempting to undertake everything itself. Coordination is certainly its responsibility, but again coordination should be collaborative and not controlling in nature. There are many partner organizations which can be drawn on to support sector development; not the least of which are DDCs, NGOs development banks and the private sector.

Sustainability through community/user ownership and assumption of O&M responsibilities is an agreed sector objective.

The roles/responsibilities table from page 46 of the Institutional Report was refined at the meeting. It is attached, incorporating the changes made by the meeting.

In it, schemes are categorized according to sizes and complexity. Categorization by size does not account for ethnic and political homogeneity which is a crucial variable in community management. Size is, however, a measurable and verifiable description and useful in this case

1. Private Schemes

It was agreed that steps should now be taken to withdraw DWSS' direct involvement in implementing shallow well handpump schemes in the Terai. DWSS will support provision of coverage by other agencies through:

(a) private sector provision of handpumps using credit schemes (described in Appendix F of the Institutional Framework Report) as may be supported by the Rural Development Banks or the Agriculture Development Bank.

(b) NGO, private firm and DDC provision of community shallow well handpumps to lowest income groups as discussed below.

2. Micro-schemes (less than 500 popl.)

These are gravity fed, community deep and shallow handpumps and spring protection, would also be supported by DWSS but through DDC's, private firms and NGOs. DWSS would act in coordinating, training, financing (where accountability was with the partner agency), and monitoring quality. In all cases "implementation" would be by the community itself as owner. DDCs are already supporting implementation of these smaller schemes through VDCs. DWSS role would be to provide technical assistance, training and manpower support to DDCs in both technical and software support.

3. Mini-schemes (popl. 500 - 2000)

Mini-schemes are of greater relevance to DWSS in that (1) other agencies are less likely to assume responsibility for their provision and (2) the demo-, geo- and hydro-graphic conditions do not allow for smaller sized schemes. In these cases DWSS will work in the role of the support agency (as in the case of ADB III) with sustainability through community ownership and management being a prime objective. ↑ basically (1980's type) CWSS-schemes (Western Dev. Region)

4. Macro-schemes (greater than 2000 popl.).

Prior to 1989 these had been specifically mandated to DWSS. Experience had demonstrated that this size of scheme (due to natural division within the community among other reasons) should be avoided. It was agreed that schemes above 2000 in population should require specific justification and approval from headquarters.

5. Municipal-schemes

For purposes of this project, the category of municipal schemes are those larger and complex schemes which may or may not serve a municipality but which are more expensive and difficult to operate and maintain In number they are approximately 22 municipal, 19 pumping and piped and 93 larger (than 5000 popl.) gravity schemes sometimes covering two and more VDCs. It was agreed that this group is a priority for handing over for community management and that a specific plan/program should be drawn up and implemented in the near future. Note was made of the fact that direct handover to user groups, corporations and municipalities was feasible thereby not necessarily requiring takeover by NWSC. The latter represents only one alternative for delegating responsibility for schemes.

6. Completed schemes requiring "hand-over".

There are numerous schemes smaller than those (5) above yet to be transferred to community ownership. This is also a priority activity already underway but progress is slow (7% thus far). The cost of each scheme's O&M may be low on an individual basis but combined, they represent a major expenditure. "Handing-over" completed schemes is more difficult than new schemes which can involve the community at very stage. In this light, repair/rehabilitation is seen as an opportunity to involve the communities and enhance community ownership and responsibility for the scheme. Scheme status and requirements need to determined and a workplan prepared to transfer these schemes to community management.

Hygiene Education and Sanitation are sub-sectors of considerable concern. Plans have been drawn up on paper and budgets allocated, but finding out what progress is being accomplished remains elusive. UNICEF is supporting hygiene and sanitation through TA and methodology trails but results are not available or unknown. Hygiene education and sanitation are important precursors to benefits from water supply yet have consistently proven near-impossible to implement. The consultants will make special effort to find out the status of hygiene and sanitation programming in the field and make recommendations for their prioritization and improvement in delivery

Management Information: considerable investment has and continues to be made in the management information system with little result. Management is fully aware of the lack of reliable and up-to-date information. Recommendation was made for the consultant to develop a workplan to reinstate the MIS, making it a functional and vital part of DWSS day-to-day management and operations.

The Sector Data Base is essential to sector planning, yet it omits private sector coverage and some NGOs Its information is valid to 1990 only. It needs updating, broadening and rationalization. A workplan is needed to upgrade it to include at least coverage and scheme status information. The consultant will provide recommendations on coverage definition, which will necessarily not be identical for all communities in Nepal.

Performance Monitoring is needed of (a) institutions in the sector and (b) staff within DWSS Recommendation for systems for both will be made by the consultants.

The meeting concluded with concensus that good understanding and agreement had been reached on what had previously been a particularly difficult subject.

Table 10.1 Institutional Responsibilities

Type	Scheme Type and Size	Ownership & O&M	Comment
Private	Shallow Handpump	Family	DWSS should disengage from direct implementation of shallow-well hand pump schemes and act as support agency to other organizations such as DDCs, NGOs and private firms It should also initiate a pilot scheme in association with development banks to provide credit to families wanting handpumps locally available on the market Sanitation would also be part of the "package" community shallow handpumps for lowest income groups will be supported by DWSS through DDCs, NGOs and private firms .
Micro	Less than 500 popl Gravity Schemes & Spring Protection Deep Tubewell and Handpump Communal Shallow Handpump	WUC or CBO	Micro schemes will be implemented by community based organizations supported by NGOs, DDCs and private sector firms These are to be supported by DWSS through technical assistance, training, monitoring quality and coordination Financing would be possible provided accountability was ensured Fast rack credit schemes for both water and sanitation are being considered for pilot implementation
Mini	500 to 2000 popl. Gravity Schemes	WUC or CBO	DWSS is heavily involved in providing services to this size of community Schemes tend to be technically more complex and communities less cohesive DWSS will provide support to water and sanitation users committees in accordance with the recently published standards Partner organizations (DDCs, NGOs and firms) will also be supported as appropriate.
Macro	Greater than 2000 popl Gravity & Pumped Schemes	Users' Assoc. VDC(s) Corporation Firm	This size of scheme is recognized as being most subject to failure and will be undertaken only when no other technical solution is feasible Most of these schemes will require continuing DWSS support Thus, justification and special approval for implementation of Macro-schemes will be required.
Municipal	Municipal Systems	Municipal Corp Municipal Dept NWSC Corporation Private Firm	This size of scheme includes municipal, pumped and piped and the larger schemes sometimes covering two or more VDCs. Continuing resource requirement for their O&M is of particular concern to DWSS They are a priority for transfer to community management through user groups, private firms and municipal department's Take-over by NWSC is also an alternative
Completed	Completed Schemes of all varieties other than of the Municipal/large category above		Completed Schemes will also be a priority for transfer to community management to community management Full community involvement will be achieved during repair/rehabilitation of these schemes

APPENDIX A

ESTIMATED COVERAGES

Estimation of actual coverage by water supply is difficult due to lack of an updated sector database and information on the status of completed projects. Further coverage figures are quite difficult to interpret in a meaningful way as there is no pragmatic and accepted standard for coverage. The only comprehensive coverage figure available in the country is that estimated by DWSS, on which all existing plans and programs are based.

A.1 DWSS Coverage Estimates.

The DWSS official coverage figures report that by the end of FY 1992/93 (as of mid July 1993) 44% of the total population (42% rural and 60% urban) were covered by the water supply facilities. The region wise coverage breakdown is given in the table below and the district wise coverage is included later in this Appendix.

Table A.1 Water Supply Coverage : 1992/93

Population in Thousands

Region	Total Population			Population covered			Covered %		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Eastern	4240.6	374 5	4615 1	1270 1	194.7	1468.8	30	52	32
Central	5427 9	1048.2	6476.1	2423.1	673 5	3096 6	45	64	48
Western	3636 6	261 0	3897 6	1280.3	163.7	1444	35	63	37
Mid Western	2376 1	133.1	2509.2	1296.8	86 5	1383 3	55	65	55
Far Western	1638 2	129.7	1767.9	940 4	56.6	997	57	44	56
Total	17319 4	1964.5	19265 9	7210.7	1175	8385.7	42	60	44

Source DWSS Planning Section - Water Supply Coverage Report 1993 August

These coverage figures were made under the following assumptions:

1 Sector Review and Development Plan [1991-2000] (SRDP) : 1991 coverage figures were taken as the base line for coverage computation. Coverage of all the projects completed after July 1990 were added to these base line figures to obtain present coverages.

- SRDP claims that its coverage estimate is the best as of 1990 and includes total water supply coverage from all sources. However names of the implementing agencies and basis for coverage calculation is not mentioned in the report.

- In SRDP water supply coverage in rural areas is based on the design population of

completed projects whereas in urban areas it is based on the actual water use derived from tariff records, number of house connections and designed population of public standposts The figures do not take into account the operating conditions of these systems, the actual population using the systems or the quality of service.

2. The post 1990 coverages does not include DDC grant in aid projects, IRDPs and NGOs not working with DWSS and private sector are not included. Only the coverage of DWSS projects and NGOs working with DWSS are included.

3. In calculating the DWSS schemes coverage following assumption were made.

- population covered = 0.67 times design population
- design population for shallow handpumps was taken as 150 for FY 1990/91 and 100 for the projects completed thereafter.
- all the projects components are designed and installed as per the standards specified by design criteria.

The following comments are made with respect to the above assumptions:

- SRDP figures appear not to be reliable as the present coverage in Manang, Bardia and Banke district exceeds the present DWSS figures if SRDP figures are to be used as the base to compute present coverages in these district. (coverage in Manang exceeds total population)
- DWSS coverage figures are based on the provision of physical facilities (design population) and do not address the issues whether the facilities are providing the intended services or the systems are used consistently by the users. Coverage figure do not account for systems requiring rehabilitation. These figures therefore tend to overestimate the actual number of beneficiaries of a system.
- Estimates do not account for adequate coverage achieved by the private sector.
- Estimates do not include the coverage of NGO working independent of DWSS It has been estimated that this NGOs' contribution to the sector is about 10% of total coverage.

A.2 FINNIDA Coverage Estimates

The Rural Water Supply and Sanitation Project (FINNIDA Project) is preparing District Water supply and Sanitation Development Plans of six districts in the Lumbini zone for use as the guidelines for selecting projects and setting priorities. Detailed field surveys covering each settlement of the district was carried out to assess the present water supply and sanitation situation and to identify the potential source/scheme for the uncovered areas The operational status of all the existing systems were analyzed in the field to assess the service level of the systems. The coverage summary of FINNIDA survey reports are given in the table below. These survey data are the most comprehensive and accurate available in Nepal.

To present the true picture of water supply situation FINNIDA has used water supply service level criteria using five parameters from the users point of view and categorised the people served in 4 service levels. FINNIDA Service Level Criteria are in Table A.6 of this Appendix .

Table A.2 FINNIDA Water Supply Coverages

District	Population			Service Level		
	Total	Served by schemes	Served %	SL1 %	SL2 %	SL1 & SL2 %
Gulmi	322212	157656	48 93	3 77	25 03	28 8
Arghakhanchi	216908	88880	40 98	12	32	44
Kapilvastu	384586	228169	59 33	15	33	48
Palpa	272724	115945	42 51	13.70	32.62	46.32
Nawalparasi	486992	342745	70 38	11 05	50 05	61 1

Source District Development Plans FINNIDA

In FINNIDA coverage figures

- Population served refers to number of people actually being served by the gravity schemes or improved ground water as primary source.
- Improved water supply coverage refers to people in service level 1
- All the water supply schemes in the districts are included and primary water sources for all clusters were identified to categories people in different service levels.

- The table above shows that only a small percentage of people served are in service level 1, which actually is the coverage indicator of improved water supply suggested by FINNIDA

Table A.3 Comparison of DWSS and FINNIDA Coverages in Lumbini Zone

District	Total Population (Census)	DWSS		FINNIDA		Coverage Ratio FINNI/ DWSS
		Population Covered	% Covered (using Census Population)	% Served (using FINNIDA Total Population)	% Served (using Census Population)	
Gulmi	271200	102800	38	48 93	58 13	1 53
Arghakhanchi	185100	93400	50	40 98	48 02	0 96
Kapilvastu	397200	78700	20	59.33	57 44	2 87
Palpa	240900	91400	38	42 51	48.13	1 27
Nawalparasi	465400	90500	19	70 38	73 64	3 87

It is worth noting that FINNIDA figures differ significantly from DWSS figures. The difference is due to

a) different baseline population figures. DWSS using census figures and FINNIDA using the population determined from their field surveys, and

b) different definition of the coverage indicators.

To compare the coverage figures, the % of population served was calculated using census population as the base for both and the coverage ratio was computed.

Except for the Arghakhanchi district the coverage reported by FINNIDA is higher than DWSS because FINNIDA figures includes gravity schemes and hand pumps wells implemented by all agencies in the district. The coverage ratio for Terai districts is high because of large number of private tube wells providing improved ground water. The ratio for hilly districts is also more than 1 due to inclusion of all agencies in the district. The coverage ratio is less than 1 in Arghakhanchi because other than DWSS there are very few agencies working in the district and the actual number of people served by DWSS projects is less than design population.

A.3 Coverage estimates:

In the absence of a complete sector database coverage of water supply facilities has been estimated using available information and applying corrections. The corrections are based on certain assumptions related to the number of schemes built by the agencies and the operating status of the projects for which detailed information is not available.

The water supply coverage is estimated under the following assumptions:

1. All the gravity schemes are serving their base population. (on average 75% of the design population is being served. There are schemes which are serving more than their design populations and there are schemes serving just the base population. Some schemes are not operating fully. So on average we can assume that 75% of the design population is being served)

2. 10% of government provided hand pumps are not functional. One hand pump provides water for 67 persons. (base population for a hand pump)

3. Private sector coverage (on average)
   a. Hill and Mountain - 5% of the total rural population.
   b. Terai - 45% of total population except in Chitwan and Dang which is 25% because of the partly hilly nature of the districts

4. The coverage of DDC schemes is 5% of the total coverage by other agencies (excluding private sector)

The estimated coverage for the different agencies are given in the table below.

Table A.4 Estimated Coverage

	Eastern	Central	Western	Mid-West	Far-West	Total	%
DWSS	460445	1069187	482271	490195	346596	2848694	14 79
UNICEF/ HELVETAS	200823	114216	294018	110282	115904	835243	4 335
MLD/IRD	53868	206827	10350	78282	27392	376719	1 955
NGO	46446	90868	171850	7607		316771	1 644
PVT.	1343800	1480205	747925	444995	385550	4402475	22 85
NWSC	90000	547280	114000	23500		774780	4 022
ADB	45973			159488	168554	374015	1 941
DDC	40936	101419	55784	38493	32922	269554	1 399
Others	11163		43196			54359	0.282
Total Covered	2293454	3610002	1919394	1352842	1076918	10252610	53 22
Total Population	4615100	6476100	3897600	2509200	1767900	19265900	
% Covered	49 69	55 74	49 25	53 92	60 92	53 22	

Here the coverage is more than the official figure, which is because of the inclusion of private sector and DDC schemes. The estimated private sector coverage is 22.85% which is about 43% of the total coverage.

These estimated coverage figures are based on single assumption for private sector coverage (45% for Terai & 5% for Hill & Mountain). The more realistic method will be to estimate the coverage after categorising the districts into topographic, hydrogeological and demographic situations and the number of implementing agencies working in the districts. However actual coverage can only be assessed with detailed field survey.

If the "Total Design Population" of all the systems installed by different agencies are considered as coverage, the "designed coverage" will definitely be higher than the estimated actual coverage.

APPENDIX A

Table A.5 WATER SUPPLY COVERAGE IN DIFFERENT DISTRICTS
BY THE END OF F.Y. 1992/93

Population in '000

SN	REGION	DISTRICT	POPULATION 1992/93			POPULATION COVERED			POPULATION COVERED %		
			URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
36	WESTERN	TANAHUN	21.8	255.4	277.2	11.9	94.2	106.1	55%	37%	38%
37	WESTERN	SYANGJA		295.8	295.8		100.7	100.7		34%	34%
38	WESTERN	KASKI	110.0	202.7	312.7	78.0	165.5	243.5	71%	82%	78%
39	WESTERN	LAMJUNG		153.8	153.8		87.3	87.3		57%	57%
40	WESTERN	GORAKHA		255.6	255.6		83.0	83.0		32%	32%
41	WESTERN	MANANG		5.1	5.1		4.0	4.0		78%	78%
42	WESTERN	MUSTANG		14.6	14 6		9.7	9.7		66%	[illegible]
43	WESTERN	MYAGDI		101.6	101.6		77.0	77.0		76%	76%
44	WESTERN	PARBAT		146.8	146.8		73.4	73.4		50%	50%
45	WESTERN	BAGLUNG		236.0	236		67.9	67.9		29%	29%
46	WESTERN	GULMI		271.2	271.2		102.8	102.8		38%	38%
47	WESTERN	ARGHAKHANCHI		185.1	185.1		93.4	93.4		50%	50%
48	WESTERN	PALPA	16.9	224.0	240.9	12.5	78.9	91.4	74%	35%	38%
49	WESTERN	NAWALPARASI		465.4	465.4		90.5	90.5		19%	19%
50	WESTERN	RUPANDEHI	86.2	452.4	538.6	46.3	88.3	134.6	54%	20%	25%
51	WESTERN	KAPILBASTU	26.1	371.1	397.2	15.0	63.7	78.7	57%	17%	20%
	SUB-TOTAL		*261.0*	*3636.6*	*3897.6*	*163.7*	*1280.3*	*1444.0*	*63%*	*35%*	*37%*

APPENDIX A

Table A.5 WATER SUPPLY COVERAGE IN DIFFERENT DISTRICTS
BY THE END OF F.Y. 1992/93

Population in '000

SN	REGION	DISTRICT	POPULATION 1992/93			POPULATION COVERED			POPULATION COVERED %		
			URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
52	MID WESTERN	DANG	55.5	317.3	372.8	46.0	172.1	218 1	83%	54%	59%
53	MID WESTERN	PYUTHAN		177.0	177		74.9	74.9		42%	42%
54	MID WESTERN	ROPLA		182.0	182		70.9	70.9		39%	39%
55	MID WESTERN	RUKUM		159.7	159.7		93.7	93.7		59%	59%
56	MID WESTERN	SALYAN		186.6	186.6		81.0	81.0		43%	43%
57	MID WESTERN	BANKE	52 3	251.3	303.6	17.0	225.7	242 7	33%	90%	80%
58	MID WESTERN	BARDIYA		312.0	312		239.3	239.3		77%	77%
59	MID WESTERN	SURKHET	25 3	214.2	239.5	23.5	129.9	153.4	93%	61%	64%
60	MID WESTERN	JAJARKOT		117.3	117.3		64.9	64.9		55%	55%
61	MID WESTERN	DAILEKH		192.1	192.1		34.6	34.6		18%	18%
62	MID WESTERN	KALIKOT		90.6	90.6		46.2	46.2		51%	51%
63	MID WESTERN	JUMLA		77.8	77.8		21.5	21.5		28%	28%
64	MID WESTERN	DOLPA		25.7	25.7		13.6	13.6		53%	53%
65	MID WESTERN	MUGU		36.6	36.6		12.1	12.1		33%	33%
66	MID WESTERN	HUMLA		35.9	35.9		16.4	16.4		46%	46%
	SUB-TOTAL		*133.1*	*2376.1*	*2509.2*	*86.5*	*1296.8*	*1383.3*	*65%*	*55%*	*55%*

APPENDIX A

Table A.5 WATER SUPPLY COVERAGE IN DIFFERENT DISTRICTS
BY THE END OF F.Y. 1992/93

Population in '000

SN	REGION	DISTRICT	POPULATION 1992/93			POPULATION COVERED			POPULATION COVERED %		
			URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
1	EASTERN	TAPLEJUNG		119.7	119.7		45.0	45.0		38%	38%
2	EASTERN	PANCHTHAR		180.3	180.3		54.2	54 2		30%	30%
3	EASTERN	ILAM	14.0	227.3	241.3	11.4	47.8	59.2	81%	21%	25%
4	EASTERN	JHHAPA	62.3	558.3	620.6	14.0	193.5	207.5	22%	35%	33%
5	EASTERN	MORANG	139	570.1	709.1	35.0	219.3	254.3	25%	38%	36%
6	EASTERN	SUNSARI	95 3	398.5	493.8	75.8	130.6	206.4	80%	33%	42%
7	EASTERN	DHANKUTA	17.9	132.5	150.4	15.0	77.5	92 5	84%	58%	62%
8	EASTERN	TEHRATHUM		105.0	105.0		46.4	46.4		44%	44%
9	EASTERN	SANKHUWASABHA		144.2	144 2		42.2	42.2		29%	29%
10	EASTERN	BHOJPUR		199.1	199.1		46.7	46.7		23%	23%
11	EASTERN	SOLUKHUMBU		98.1	98.1		37.4	37.4		38%	38%
12	EASTERN	OKHALDHUNGA		140.6	140.6		60.6	60.6		43%	43%
13	EASTERN	KHOTANG		217.1	217.1		52.6	52.6		24%	24%
14	EASTERN	UDAYAPUR		232.7	232.7		28.1	28.1		12%	12%
15	EASTERN	SAPTARI	25.7	458.2	483.9	24.5	106.9	131.4	95%	23%	27%
16	EASTERN	SIRAHA	20.3	458.9	479.2	19.0	81.3	100 3	94%	18%	21%
		SUB TOTAL	*374.5*	*4240.6*	*4615.1*	*194.7*	*1270.1*	*1464.8*	*52%*	*30%*	*32%*

APPENDIX A

Table A 5 WATER SUPPLY COVERAGE IN DIFFERENT DISTRICTS
BY THE END OF F.Y. 1992/93

Population in '000

SN	REGION	DISTRICT	POPULATION 1992/93			POPULATION COVERED			POPULATION COVERED %		
			URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
17	CENTRAL	DHANUSHA	65.6	502.1	567.7	12.0	314.8	326.8	18%	63%	58%
18	CENTRAL	MAHOTTARI	18.6	440.1	458.7	11.7	332 5	344.2	63%	76%	75%
19	CENTRAL	SARLAHI	14.4	496.7	511.1	12 2	357.6	369.8	85%	72%	72%
20	CENTRAL	SINDHULI		231.4	231.4		54.3	54.3		23%	23%
21	CENTRAL	RAMECHHAP		194.5	194.5		67.6	67.6		35%	35%
22	CENTRAL	DOLOKHA		178.6	178.6		95.6	95.6		54%	54%
23	CENTRAL	SINDHUPALCHOK		266.1	266.1		125.5	125.5		47%	47%
24	CENTRAL	KABHREPLANCHOK	22.7	306 1	328.8	19.5	94.4	113.9	86%	31%	35%
25	CENTRAL	LALITPUR	126.6	150.0	276 6	95.9	71.9	167.8	76%	48%	61%
26	CENTRAL	BHAKTAPUR	64.0	112.1	176.1	48.0	33.7	81.7	75%	30%	46%
27	CENTRAL	KATHMANDU	470.4	264.3	734.7	335.6	147.0	482.6	71%	56%	66%
28	CENTRAL	NUWAKOT	21.7	233.4	255.1	5.6	64.9	70.5	26%	28%	28%
29	CENTRAL	RASUWA		38.2	38.2		18.5	18.5		48%	48%
30	CENTRAL	DHADING		287.2	287.2		52.5	52.5		18%	18%
31	CENTRAL	MAKWANPUR	59 0	273.6	332.6	22.0	66.3	88.3	37%	24%	27%
32	CENTRAL	RAUTAHAT	21.7	409.9	431.6	10.0	145.3	155.3	46%	35%	36%
33	CENTRAL	BARA	25.4	410.1	435.5	15.0	175.5	190.5	59%	43%	44%
34	CENTRAL	PARSA	75.3	317.0	392.3	35.0	146.7	181.7	46%	46%	46%
35	CENTRAL	CHITWAN	62.8	316.5	379.3	51.0	58 5	109.5	81%	18%	29%
		SUB TOTAL	*1048.2*	*5427.9*	*6476.1*	*673.5*	*2423.1*	*3096.6*	*64%*	*45%*	*48%*

Table A.6 Water Supply Service Levels

Category	Requirements to be met (the poorest characteristic decides the service level)				
	Quality	Quantity (l/c/day)	Accessibility (min)	Reliability (months/y)	Continuity (hr/day)
Service level 1 **Good**	Protected Source	> = 45	< = 15	12	> = 6
Service level 2 **Acceptable**	Spring or better	> = 25	< =30	> =11	> =5
Service Level 3 **Poor**	Any Source	> =15	< =60	> =10	> =4
Service Level 4 **Very Poor**	All other water supplies				

Source DDP- Gulmi District , FINNIDA

Protected Source .

a) protected spring with clear water quality
b) borehole or well with clear water quality and good platform, > 10m deep, equipped with pump or handpump
c) artesian well with clear water quality and proper platform.

Acceptable Source

a) borehole or well wth clear water quality, <10 m deep
b) borehole, well or artesian well with clear water quality but without proper platform
c) spring with clear water quality

APPENDIX A

Table A.5 WATER SUPPLY COVERAGE IN DIFFERENT DISTRICTS
BY THE END OF F.Y. 1992/93

Population in '000

SN	REGION	DISTRICT	POPULATION 1992/93			POPULATION COVERED			POPULATION COVERED %		
			URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
67	FAR WESTERN	BAJURA		94.0	94.0		63.3	63.3		67%	67%
68	FAR WESTERN	BAJHANG		142.2	142.2		45 8	45.8		32%	32%
69	FAR WESTERN	ACHHAM		200.2	200.2		91.2	91.2		46%	46%
70	FAR WESTERN	DOTI	12.9	157.6	170.5	12.0	76.5	88.5	93%	49%	52%
71	FAR WESTERN	KAILALI	49.8	413.2	463.0	15.8	278.9	294.7	32%	67%	64%
72	FAR WESTERN	KANCHANPUR	67.0	214.5	281.5	28.8	203.4	232.2	43%	95%	82%
73	FAR WESTERN	DADELDHURA		108.2	108.2		67.9	67.9		63%	63%
74	FAR WESTERN	BAITADI		204.4	204.4		66 2	66.2		32%	32%
75	FAR WESTERN	DARCHULA		103.9	103.9		47.2	47 2		45%	45%
	SUB-TOTAL		*129.7*	*1638.2*	*1767.9*	*56.6*	*940.4*	*997.0*	*44%*	*57%*	*56%*
	TOTAL		1946.5	17319.4	19265.9	1175.0	7210.7	8385.7	60%	42%	44%

Table A.7 ESTIMATED COVERAGE IN CENTRAL REGION

Districts	POP-N	DWSS	UNICEF	MLD/IRD	NGO	NWSC	PVT	DDC	TOTAL	COVERAGE
Sindhupalchowk	266100	35636	18659	15470	2966		13305	3637	89672	33.70%
Kavre	328800	27525	18741	23570	12945		15305	4139	102225	31 09%
Lalitpur	276600	65009		33190	2000	63150	7500	8167	179016	64.72%
Bhaktapur	176100	27557		11600	2200	40000	5605	4068	91030	51.69%
Kathmandu	734700	69079		27508	23258	379130	13215	24949	537139	73.11%
Nuwakot	255100	18143	1202	29232			11670	2429	62676	24.57%
Dhading	287200	18913		32520	2420		14360	2693	70906	24.69%
Rasuwa	38200	8972		6999			1910	799	18680	48.90%
Makawanpur	332600	28358	22084			21000	13680	3572	88694	26.67%
Rautahat	431600	76331		4000	10000		194220	4517	289068	66.98%
Bara	435500	100991			10000		195975	5550	312516	71.76%
Parsa	392300	55615			10000	33000	176535	4931	280081	71.39%
Chitwan	379300	77025	11705		5500		94825	4712	193767	51.09%
Dhanusa	567700	111449				11000	255465	6122	384036	67.65%
Mahottari	458700	152735					206415	7637	366787	79.96%
Sarlahi	511100	129471					229995	6474	365940	71.60%
Sindhuli	231400	20407	15752				11570	1808	49537	21.41%
Ramechhap	194500	22357	14484		9580		9725	2321	58467	30.06%
Dolakha	178600	23614	11589	22738			8930	2897	69768	39.06%
Total	6476100	1069187	114216	206827	90868	547280	1480205	101419	3610003	55.74%
Percentage	100 00%	16 51%	1.76%	3.19%	1.40%	8 45%	22.86%	1 57%	55.74%	

Table A.7 ESTIMATED COVERAGE IN EASTERN REGION

Districts	POP-N	DWSS	ODA	ADB	UNICEF	MLD/IRD	NGO	NWSC	PVT	DDC	TOTAL	COVERAGE
Taplejung	119700	11933			13900	2392	8833		5985	1853	44896	37.51
Panchthar	180300	10919			24791	5984	6765		9015	2423	59897	33.22
Ilam	241300	29317			24688	3650	6859		11365	3226	79104	32.78
Jhapa	620600	57028	4358	5850	28325				279270	4778	379609	61.17
Morang	709100	30262	6805	4200	25117			60000	319095	3319	448798	63.29
Sunsari	493800	55744		14800	10576			30000	222210	4056	337386	68.32
Dhankuta	150400	31895			1000	8900	660		6625	2123	51203	34.04
Bhojpur	199100	19302			5080	9290	3278		9955	1848	48753	24.49
Sankhuwasabha	144200	21487			3105	7232	3396		7210	1761	44191	30.65
Terhathum	105000	21932		1583	5350	5560	2150		5250	1829	43654	41.58
Solukhumbu	98100	8292		1015	15158	1560	825		4905	1343	33098	33.74
Okhaldhunga	140600	32867		1475	21743		2241		7030	2916	68272	48.56
Khotang	217100	12641			12274	2100	11440		10855	1923	51233	23.60
Udayapur	232700	10141			9716	5200			11635	1253	37945	16.31
Saptari	483900	55497		13000		1000			217755	3475	290727	60.08
Siraha	479200	51187		4050		1000			215640	2812	274689	57.32
Total	4615100	460445	11163	45973	200823	53868	46446	90000	1343800	40936	2293453	49.69
Percentage	100.00%	9.98%	0.24%	1.00%	4.35%	1.17%	1.01%	1.95%	29.12%	0.89%	49.69%	

Table A.7 ESTIMATED COVERAGE IN MID WESTERN REGION

District	POP	DWSS	ADB	UNICEF	MLD/IRD	NGO	NWSC	PVT.	DDC	Total	Coverage %
Rukum	159700	16609	11659	33000	2700			7985	3198	75151	47.06
Rolpa	182000	27356	5882	17158	3750	957		9100	2755	66958	36.79
Salyan	186600	17860	5400	20694	1900			9330	2293	57477	30.80
Pyuthan	177000	17836	14934	5969	10275	1132		8850	2507	61503	34.75
Dang	372800	78980	28775		8060			93200	5791	214806	57.62
Jajarkot	117300	11125	13596	15400				5865	2006	47992	40.91
Dailekh	192100	6145	3060	7160	8168			9605	1227	35365	18.41
Surkhet	239500	54240	9170	9501	26485	5518		10710	5246	120869	50.47
Banke	303600	111500	24500				23500	136620	3000	299120	98.52
Bardiya	312000	98945	25000					140400	6197	270542	86.71
Dolpa	25700	9515			2240			1285	588	13628	53.03
Jumla	77800	2257	2127		10924			3890	765	19963	25.66
Mugu	36600	5738	1558		1320			1830	431	10877	29.72
Humla	35900	8604		1400	1460			1795	573	13832	38.53
Kalikot	90600	23485	13827		1000			4530	1916	44758	49.40
TOTAL	2509200	490195	159488	110282	78282	7607	23500	444995	38493	1352841	53.92
Percentage	100.00%	19.54%	6.36%	4.40%	3 12%	0.30%	0.94%	17.73%	1 53%	53.92%	

Table A.7 ESTIMATED COVERAGE IN WESTERN REGION

Districts	POP-N	DWSS	MLD/IRD	HELVETAS	FINNIDA	NGO	NWSC	PVT	DDC	Total	Coverage
Kaski	312700	58415		67579		10864	74000	10135	10543	231535	74.04%
Tanahun	277200	32805		19543		16712		12770	3453	85283	30.77%
Lamjung	153800	34847	3443	16661		10872		7690	3291	76804	49.94%
Gorkha	255600	28239		13116		22466		12780	3191	79792	31.22%
Syangja	295800	21537		14838		17446		14790	2691	71302	24.10%
Manang	5100	2422		1030		480		255	197	4384	85.95%
Mustang	14600	4245	1470	2672		3050		730	572	12739	87.25%
Myagdi	101600	30232	1760	27482		2112		5080	3079	69745	68.65%
Parbat	146800	22285		16676		3960		7340	2146	52407	35.70%
Baglung	236000	19335		15671		14455		11800	2473	63734	27.01%
Gulmi	271200	31360	1384	33454	5327	15100		13560	4331	104516	38.54%
Argakhanchi	185100	40230	2293	24020	4785	2510		9255	3692	86785	46.89%
Palpa	240900	45320		21276	3547	36823		11200	17000	135166	56.11%
Nawalparasi	465400	41323		20000	2178	3000		209430	3325	279256	60.00%
Kapilbastu	397200	43701				2000		178740	2285	226726	57.08%
Rupandehi	538600	25975			27359	10000	40000	242370	5167	350871	65.15%
Total	3897600	482271	10350	294018	43196	171850	114000	747925	55784	1919394	49.25%
Percentage	100.00%	12.37%	0.27%	7.54%	1.11%	4.41%	2.92%	19.19%	1.43%	49.25%	

Table A.7 ESTIMATED COVERAGE IN FAR WESTERN REGION

Districts	POP-N	DWSS	UNICEF	ADB	MLD/IRD	PVT.	DDC	Total	Coverage %
Dadeldhura	108200	12965	21687	9445	5320	5410	2471	57298	52 96
Kailali	463000	151536		46994		208350	9927	416807	90.02
Kanchanpur	281500	78671		37903		126675	5829	249078	88 48
Baitadi	204400	15827	14870	7800	2350	10220	2042	53109	25.98
Darchula	103900	5690	7802	9521	4630	5195	1382	34220	32.94
Achham	200200	21349	26571	20651	5185	10010	3688	87454	43.68
Bajhang	142200	10952	12140	5391	3567	7110	1603	40763	28.67
Bajura	94000	10420	11720	12130	3690	4700	1898	44558	47.40
Doti	170500	39186	21114	18719	2650	7880	4083	93632	54.92
Total	1767900	346596	115904	168554	27392	385550	32922	1076918	60.92
Percentage	100.00%	19.60%	6.56%	9.53%	1.55%	21.81%	1.86%	60.92%	

APPENDIX B

FIELD SURVEY REPORT

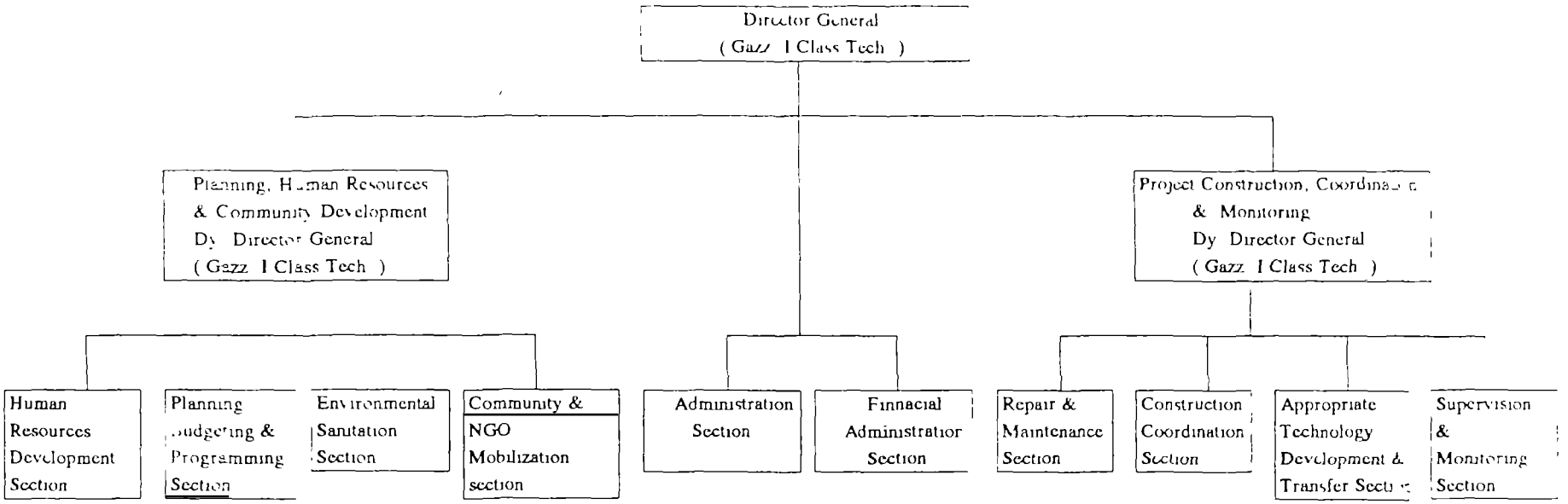
48 case studies and data analysis have been carried out and individual reports prepared These have been bound in one volume and will be made available on request in diskette form

APPENDIX C

DWSS ORGANOGRAM

DEPARTMENT OF WATER SUPPLY & SEWERAGE

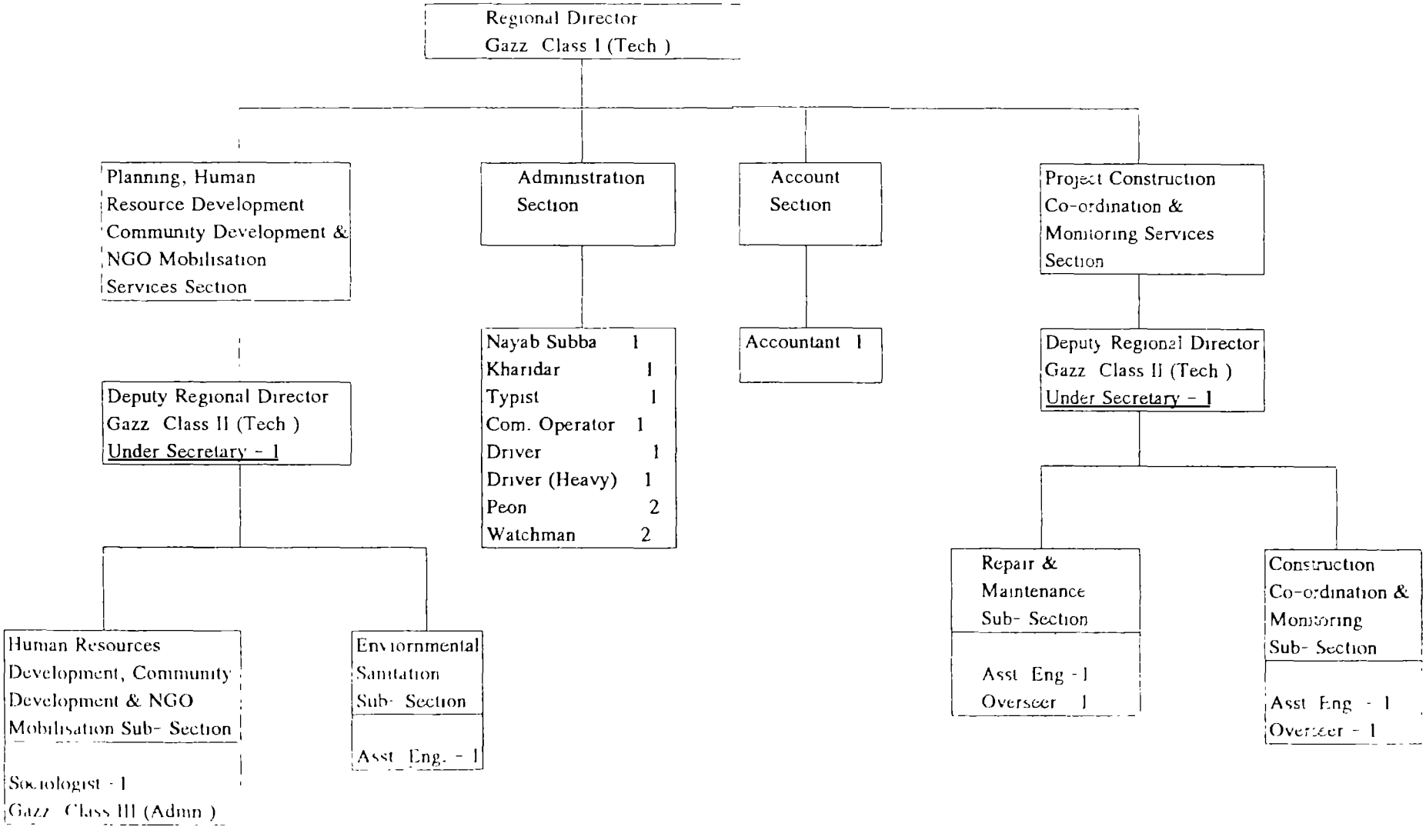
APPENDIX C-1



DEPARTMENT OF WATER SUPPLY & SEWERAGE

ORGANISATION CHART OF 5 REGIONAL DIRECTORATES

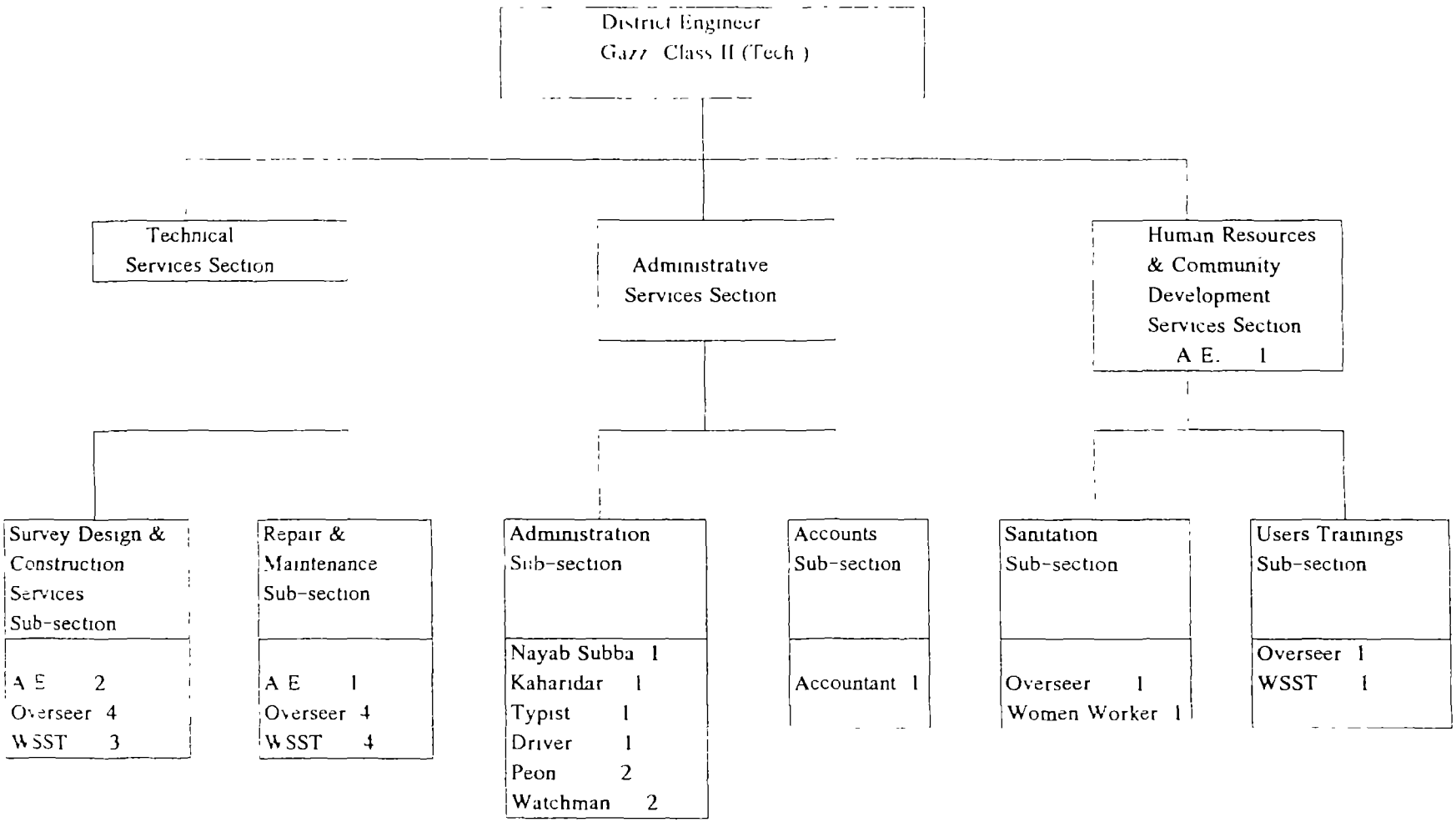
APPENDIX C 2



TYPE "A"

DEPARTMENT OF WATER SUPPLY & SEWERAGE
DISTRICT WATER SUPPLY OFFICE

APPENDIX C 3

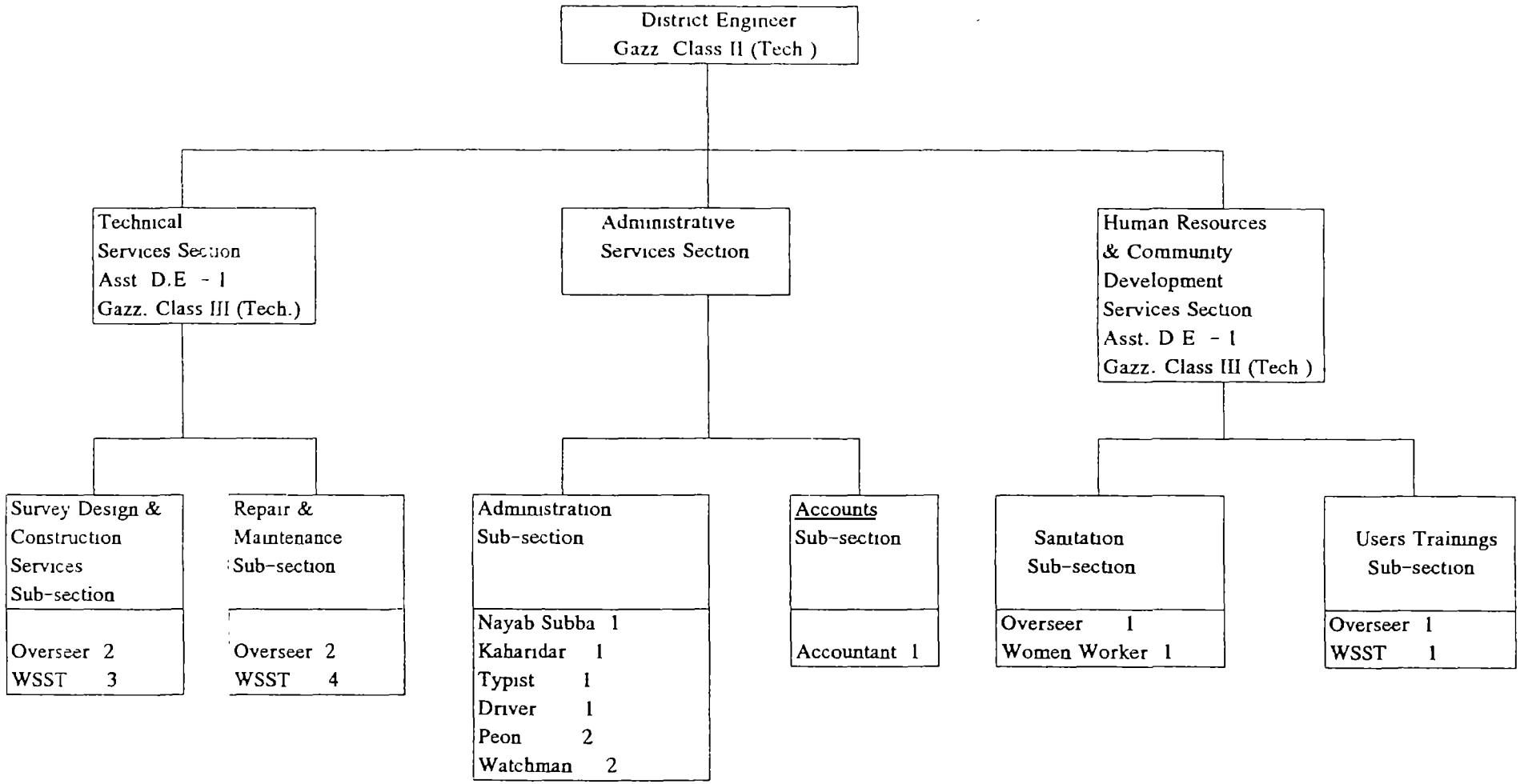


DISTRICTS

1 DHANKUTA 2 KATHMANDU 3 KASKI 4 SURKHET 5 DOTI

DEPARTMENT OF WATER SUPPLY & SEWERAGE

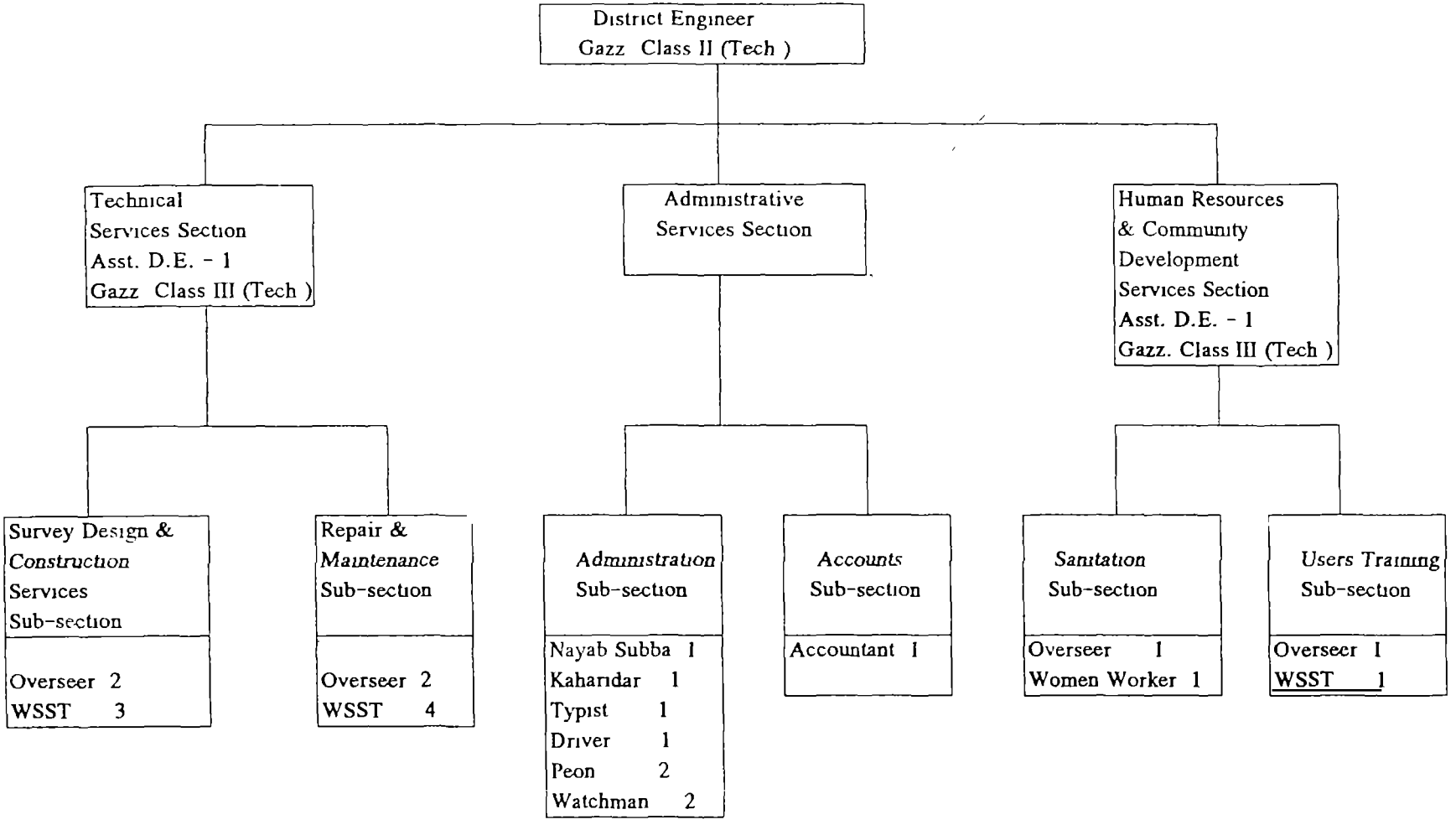
TYPE "B" DISTRICT WATER SUPPLY OFFICE APPENDIX C-4



DISTRICTS

1 Panchthar	2. Ilam	3 Jhapa	4. Sunsari	5. Morang
6. Udayapur	7. Siraha	8. Saptari	9. Dolkha	10 Sindhuli
11. Sarlahi	12 Mahotari	13 Dhanusha	14. Sindhupalchok	15. Kavrepalanchok
16 Lalitpur	17 Dhadhing	18 Nuwakot	19. Bara	20. Parsa
21 Rautahat	22 Makawanp	23 Chitwan	24 Gorkha	25. Tanahun
26 Lamjung	27. Syangja	28 Baglung	29 Palpa	30 Nawalparasi
31 Arghakhanchi	32. Rupandehi	34. Kapilbastu	34. Gulmi	35 Salyan
36 Dang	37. Banke	38. Kailali	39 Darchula	40 Baitadi
41 Dadeldhura	42. Kanchanpur			

DEPARTMENT OF WATER SUPPLY & SEWERAGE
DISTRICT WATER SUPPLY OFFICE



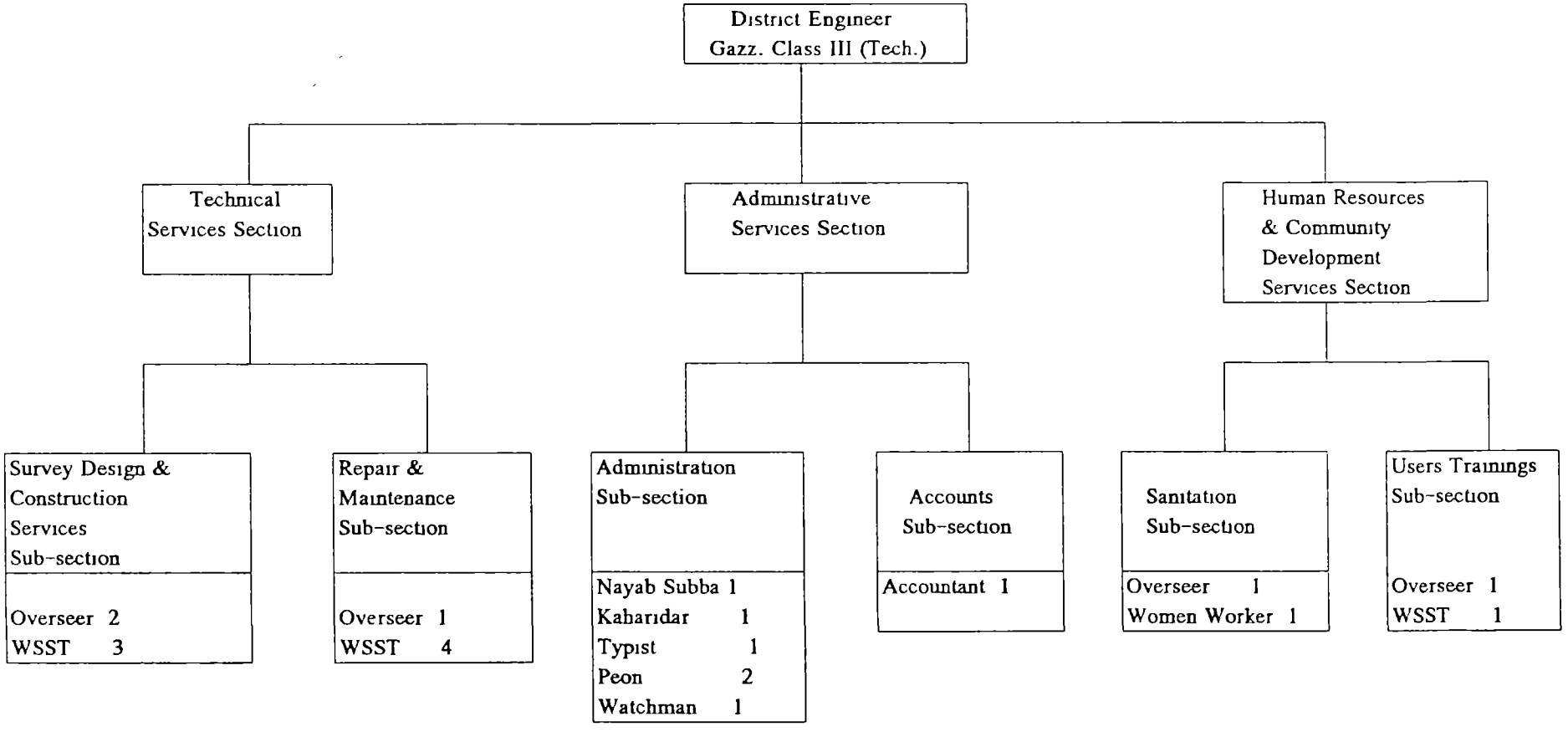
DISTRICTS

1 Terhathum	2 Bhojpur	3. Okhaldhunga	4 Khotang
5 Ramechhap	6 Rolpa	7 Pyuthan	8 Rukum
9 Dailekh	10 Jajarkot	11 Bajhang	12 Bajura
13 Achham			

TYPE "D"

DEPARTMENT OF WATER SUPPLY & SEWERAGE
DISTRICT WATER SUPPLY OFFICE

APPENDIX C-6



DISTRICTS

1. Taplejung	2 Sankhuwasabha	3. Solukhumbu	4 Rasuwa
5. Bhaktapur	6 Parbat	7 Myagdi	8. Mustang
9 Manang	10 Bardiya	11 Humla	12 Jumla
13 Mugu	14 Kalikot	15. Dolpa	

DWSS HANDOVER OF COMPLETED SCHEMES

Municipal, Pumped and Large Schemes

All larger and complex schemes come in this category. These schemes are more expensive and difficult to operate and maintain. The total number of such schemes under DWSS jurisdiction is 131 at present and more are being planned and built For the purpose of this report, the larger and complex schemes are divided into four groups

- municipal schemes
- pumped schemes
- large gravity schemes with design population > 7000 people
- large gravity schemes with design population between 5000 to 7000 people.

a *Municipal Schemes.* There are 22 municipal systems which are operated and maintained by DWSS. Out of 22, 8 are gravity, 13 are pumping (Bharatpur has both gravity and pumping systems) The served populations of these systems vary from 10,000 to 30,000 with the exception of Bharatpur which serves about 65,000 population. The seven municipal systems of Lahan, Rajbiraj, Bhadrapur, Ilam, Mahendranagar, Dhanagadi and Bharatpur are recently rehabilitated by JICA assistance. Six systems Dipayal, Kapilbastu, Tulsipur, Bidur, Kalaiya, Jaleswor are under rehabilitation through ADB's second project. Two more systems Damak and Dhankutta are under construction with ODA assistance The remaining 7 municipal systems are 10 to 14 yrs old. The list of municipal schemes is given in Table D 3 at the end of this appendix.

b *Pumped Schemes:* Outside municipalities, there are 18 pumping schemes which serve mostly semi-urban areas Eight schemes are recently (within 3 years) completed Seven schemes are more than 9 years old. The design population of these schemes varies from 3000 to 14000.

c *Large Gravity Schemes With Design Population > 7000:* This group comprises 51 systems often serving two or more VDCs. The age of these systems varies from 1 to 17 years 24 schemes are older than 8 yrs old. 22 schemes have design populations of more than 10,000 The largest scheme is Pithuwa with a design population about 25000.

d *Large Gravity Schemes With Design Population Between 5000 to 7000.* This group comprises 40 systems Out of forty, 27 are more than 8 yrs old.

Financial, Human Resources and Administrative burdens.

For operation and maintenance, the 22 municipal systems require about 175 staff including meter readers, technicians, plumbers, assistant accountants and peons. Out of these 175, the Tansen system has 56 staff.

For the 18 pumping systems outside municipalities, about 92 staff are engaged in O&M with an average of 5 persons per scheme For the third and fourth group of schemes (91 in number), it can be assumed that on the average 3 persons per schemes are employed in each. About 273 persons are providing O&M of these schemes

The total number of staff employed to run all these 131 schemes is 540.

On the average NRs 24,000 is required per person per year to cover salaries, allowances and other benefits An overhead of 40% of this amount is needed for administrative, accounting and managerial support. Thus, the total personnel cost required for 540 staff is around NRs 18 0 million

The maintenance cost of these larger and complex schemes is NRs 6 6 million on the basis of an average of NRs. 50,000 per scheme per year. For 32 pumped schemes (including 14 municipals), the total energy cost is NRs 2 4 million with an average NRs, 75,000 per pumped scheme per year

Therefore, in order to operate and maintain these schemes, the total personnel, maintenance and energy cost is around NRs 27 million per year.

Other Completed Schemes

Apart from the 131 larger and complex schemes. There are 852 other smaller rural projects completed by DWSS. these projects may comprise either a single scheme or multiple schemes It also includes ADB I and ADB II projects. Through ADB I, 74 projects are completed 15 are completed under ADB II. Out of 852, 70 DWSS and ADB projects have been handed over to users committees.

An additional 950 schemes have been completed through the CWSS program These schemes were implemented along the community based approach. For O&M, one or more VMWs per scheme were trained during the construction Users' committees are responsible for O&M All O&M costs should be to be borne by beneficiaries However, in many cases materials and fittings are still being provided by DWSS.

CWSS projects are mostly single schemes and therefore are smaller in size The cost of the materials and fittings provided to these projects is not substantial

Since 1990, FINNIDA has assisted the RWSS program initiated in Lumbini zone To date, 54 schemes are completed The RWSSP approach is similar to the CWSS program In this program all O&M costs are also to be borne by beneficiaries

Financial, Human Resources & Administrative Burdens

Out of the total 852 non - CWSS projects, 70 have been handed over to users' committees The remaining 782 projects are operated and maintained by DWSS. For O&M at least 782 staff are required at the rate of 1.0 person per project. With NRs. 2000 per person per month for salary, allowances and other benefits and 40% overhead, each staff costs NRs. 33,600 per year.

The total expenses for O&M of these projects to DWSS is estimated at NRs 26 million.

Further, it is estimated that around NRs. 9 million is required for maintenance of 758 projects at the rate of NRs. 1000 per month per project. Thus, the total maintenance and personnel costs to operate 782 projects is NRs 35 million

Experience in Handover of larger Schemes

In the early seventies, attempts were made to handover a few urban systems to municipalities for operation and maintenance. The water distribution component was looked after by municipalities whereas DWSS retained responsibility for water production The approach did not work due to lack of technical manpower in the municipalities. Consequently the operation and maintenance responsibility for these schemes had to be returned to DWSS.

The DWSS has established a policy of handing over all completed rural schemes when the development of all water supplies was brought under the umbrella of MHPP in 1987. To date, among the large & complex schemes only three schemes (Bensisahar & Charkatirtha in Lamjung & Budhbare in Jhapa) have been handed over to users' committees.

Difficulties in handover of these larger and complex schemes are the result of:

a Reluctance to assume responsibility

The majority of these schemes are large and were not designed and constructed for community maintenance. Many of the pumping schemes with overhead tanks are neither financially or economically viable nor least cost technical options. Further, the concept of cost recovery and sustainability was given little thought while designing and implementing these schemes with Tansen being a prime example. In addition, communities were neither involved nor consulted during planning and implementation. It is not surprising then that communities are reluctant to take over these large schemes.

b. Need for Rehabilitation

Most of these schemes do not provide the level of services they were designed for due to lack of adequate O&M and calibre personnel. The majority of these large and complex schemes provide intermittent services and require rehabilitation.

c Inadequate Cost Recovery

Tariff rates used are wholly inadequate. At that, revenues are deposited into the consolidated revenue of HMG in Kathmandu providing little incentive to DWSS to raise tariff and service levels. These schemes remain heavily subsidized and therefore under political influence. Unfortunately, the result is that they continue to provide substandard service with little hope of improvement under the present system of management. Indeed DWSS cannot improve service levels given present budgetary levels , but the problems are not only budgetary.

d Commitment for Handover

Although there is a set policy to handover completed schemes, there has been only limited planned and coordinated effort to put policy into practice. Priority is first given to the extension of coverage in an attempt to meet targets set by government

Experience in Handover of Smaller Projects

The field review of schemes carried out by this project included several schemes whose users were being approached by DWSO to handover schemes. Methodologies varied about the overall conclusion was that didactic methods were the norm and participatory negotiations a rarity. In general DWSOs use written communications through DDC/VDCs requiring communities accept their schemes. Leaders of communities are the communication points rather than the WUC or mass meetings. At that, when user committees are formed they are selected by the leaders, the rest of the community not knowing who their members are and not being involved in their selection.

Communities are reluctant to takeover schemes as most need rehabilitation or repair Negotiations with communities are under way in many districts but for the most part they are stilted and not participatory or supportive of the community. This is an understandable outcome of the way in which DWSS centre has set objectives and instructed districts to handover. Under pressure of time and resources, compled with lack of experience in participatory approached the DWSOs naturally use didactic methods.

Out of 852 projects, 70 (including 24 ADB I) are handed over. All CWSS schemes are operated and maintained by beneficiaries. Minor repair is also the responsibility of users committee The CWSS schemes were successfully handed over because of:

Smaller Scheme Size: Generally a CWSS project is a single scheme. The served population is usually less than 1000 and always below 1500. Being smaller in size, the quality of construction and supervision is also comparatively good. Smaller communities tend to be cohesive and therefore community management of schemes is more feasible.

Community Participation. During implementation communities were always involved in CWSS schemes Their contribution was around 15 to 30% of the total cost of the scheme, mostly in the form of unskilled labour. This contribution has greatly helped for taking over the schemes

Trained VMW: VMWs were trained in each scheme/community during the construction. The construction was carried out through users committees. Thereby, beneficiaries were able to understand the various components of the schemes and their functions. At the handover, spare materials and tools were given to users' committee. This also helped users gain confidence in carrying out O&M on their own.

Felt - need. CWSS projects were very carefully selected on the basis of felt-need, communities willingness to participate, and potential for community management

Policies of Handover

Prior to 1987, the DWSS was mandated to implement larger water supply systems with populations more than 1500 There was no set policy of involving communities during planning, implementation and O&M This approach has resulted many unsustainable water supply systems and DWSS is required to spend an estimated NRs 62 million for O&M on the projects The MHPP Directives - 2047 recommend that the management of completed projects is organised through users' committees However, due to lack of detailed procedures for handing over, only 70 projects have been transferred to users' committees and the quality of handover is not known.

According to the Municipality Act and VDC of Act 2048, local bodies are mandated to take over the responsibility of providing drinking water and sanitation facilities The Eighth Plan states that priority will be given to projects which are small in scale, require less per capita cost, can attract peoples participation . . .. and can be implemented, operated, repaired and maintained at the grass root level The Plan further stresses that it is necessary to arrange the contribution of all the users in operation and maintenance of the facility Therefore, (according to the Eight Plan) as a policy of handing over all the completed rural water supply projects to users' committees, about 240 piped water supply projects will be repaired and handed over during the Eighth Plan period

Arrangements for Handover

The Directives - 2047, Annex 4 provides the recommended contract between DWSO and users committees for the operation, maintenance and repair of water supply schemes This contract defines the responsibilities of both parties for O&M Most of the regular operation and maintenance costs are proposed to be borne by the beneficiaries

The Directives - 2047 state that all new water supply projects including on-going ones must be implemented through users committees. In addition "Standards" have now been prepared for implementing community based projects These Standards provide detailed procedures on handover of new schemes

According to the Standards, an engineer from DWSO must visit the scheme at its completion The engineer is responsible to check all the system components and make sure that the system is 100% completed Only after this, the scheme completion ceremony takes place. At the completion ceremony, the engineer fills in a completion report with one or two pages of comments on possible O&M problems, general status, construction variations from design and status of sanitation. At this stage the contract between DWSO and users committee is signed, VMW is given authorized appointment with mode of payment, spare materials and tools are handed over, and finally an ownership certificate is given to the users' committee.

These Standards have only recently reached the DWSO's They will undoubtedly be used and have an impact. Actual quality of handover, and the arrangements made for it vary from district to district Arrangements vary from nil to placing handover as a high district priority This is an area which needs much work and encouragement

Recently, consultants have been hired to explore the possibilities of handing over Bharatpur scheme to the private sector. This is a good step forward and represents the first of what will be many arrangement for handover Unfortunately, the contract has just been let, making it impossible to assess the experience

Recommendations and Workplan

The handover of these 131 large and complex schemes should be the top priority of the DWSS which would eventually result a net saving of at least NRs 27 million per year For this, a Handover Unit needs to be established at an appropriate level in DWSS having branches in each regional office This unit would carry out studies of the projects and establish detailed procedures and workplans for handovers

Of the 22 municipal systems, 15 are either recently rehabilitated or under rehabilitation The start made by DWSS to handover the Bharatpur scheme to the private sector is entirely appropriate The other 14 municipal schemes can be handed over to municipalities, private firms, NWSC or separate independent utilities on a case by case basis The remaining seven systems are 10 to 14 years old including Tansen The Tansen system is unlikely to be handed over in its present form Priority is needed for rehabilitation of the other six schemes in order to handover these schemes to an appropriate agency The following table summarizes the range of population coverage and average age of the 131 larger and complex schemes

Table D.1 Summary of Larger and Complex Completed Schemes

Category	No of Schemes	Constructed or Rehabilitated within 4 years	In need of repair or rehabilitation (estimated)	Average Age	Range of Age	Range of Served Pop
Municipal pumped	14	10	4	3	1 - 14	10,000 - 25,000
Municipal gravity	8	5	3	4	1 - 12	10,000 - 30,000
Non-Municipal pumped	18	8	10	6	1 - 15	1,500 - 10,000
Large gravity > Design 7000 pop	51	20	31	6	1 - 17	4,000 - 7,000
Large gravity between 5000 to 7000 Design Pop	40	7	33	10	1 - 14	3,000 - 5,000

Tansen system is a special case The distribution network of this system is about 80 years old. Yet, the water is pumped vertical 498 meters up to provide 2 hours supply daily to the Tansen population. The network will likely need complete rehabilitation All available sources will have to be reviewed and a new project which will minimize costs and reliance on pumping needs to be established Such complete rehabilitation is the only way by which it can be taken over by the municipality. Tansen municipality is constructing a small gravity scheme with the assistance of the MSMD project. This gravity scheme will be operated and maintained by the municipality This is an indication that if the Tansen system is financially viable, even with a modest service level, the municipality will very likely be willing to takeover the system.

For those 18 pumping schemes outside municipalities, the handover process should follow a similar procedure to the municipal systems The old and larger systems need rehabilitation Out of the 51 large complex gravity schemes with design pop > 7000 people, 20 are recently (within 4 years) completed. Priority is needed to handover these schemes. The remaining 31 schemes will need some kind of repair works. Likewise, out of 40 large gravity schemes with design pop between 5000 to 7000, seven are recently (within 4 years) completed. These schemes could be handed over in this fiscal year. The Users' Committee is the best management resource to takeover the majority of non municipal gravity schemes For those exceptional cases, investigations should be carried out to identify alternatives which may be a VDC or even a private sector firm.

It is clear that all schemes will require rehabilitation or repair of one form or another This should looked upon as an opportunity rather than a burden. Generally, communities and municipalities are indicating a willingness to undertake ownership and responsibility if the schemes are brought up to a modest service level They should brought into the process and given decisionary powers over their schemes upgrading before hand over If these opportunities are taken, they will greatly enhance the potential for future user management

The Handover Unit

Strong recommendation is made to make "handover" a top priority program within DWSS
Continued provision of maintenance to existing schemes is against government policy
Besides, the allocated budget of 50,000 Rs/yr per district is wholly inadequate. O&M is
costing government very large sums which would be better used elsewhere, most are being
drawn from development budgets.
Generally communities are willing to assume
responsibility, if the systems are rehabilitated to provide the level service they were originally
designed for
This is an ideal opportunity for DWSS to shed responsibility and expense
thereby relieving pressure on reportedly tight budgets and staff shortages in the districts
A commitment is needed within DWSS which can focus, monitor, support and in fact drive
the effort forward.

A Handover Unit is recommended to be established within DWSS attached directly to the
office of the DDG, Planning, Human Resource and Community Development. The functions
of this unit would be to

- *Study and prioritize schemes for handover*
- *Develop workplans specifying the steps, responsibilities within DWSS,*
- *budgets and schedules to carry out each handover*
- *Set targets, recommend staffing and ensure adequate budgets and logistics for*
- *the handover program of district level.*
- *Provide technical assistance and provide feedback to DWSS sections carrying out the*
- *Monitor, evaluate and provide feedback to the handover preparation process*
- *program at district level.*

The following steps are suggested procedure for handover.

1. Undertake indicative studies of all large/pumped/municipal schemes in order to establish

- *status of the systems and history or background*
- *perception of users*
- *possible management options*
- *legal aspects/requirements*
- *political situation*
- *pre-requisites and pre-conditions*
- *rehabilitation/repair requirements including costs*
- *costing of O&M*
- *staffing and HRD requirements*

2 Prioritize the schemes

3 Conduct more detail studies on the above (a) to (i) on priority schemes

4. Allocation of resources after decision

- publicity and preparation of communities
- creation of an organisations for management
- recruitment and training of staff
- establish a system for administration
- rehabilitate/repair
- meet legal requirements for handover
- establish tariff and financial management
- achieve handover
- provide continued support

The following table provides suggested tentative handover schedule

Table D.2 Handing Over Schedule of Urban, Large & Complex Schemes

	1994	1995	1996	1997	1998	1999	2000	Total
Group 1 Municipal Systems	3	6		5	1			22*
Group 2 Pumping	4	4	5	5				18
Group 3 Large Complex Gravity Pop > 7000	5	7	10	12	8	5	4	51
Group 4 Large Complex Gravity Pop between 5000-7000	6	8	8	10	4	4		40

This schedule has been designed taking rehabilitation requirements into account Those schemes requiring little or no repair are presumed to be handed over in 1994/5 allowing time for the major rehabilitation works to begin during 1995 for handover from 1996 onwards. It is assumed that the Handover Unit will be put in place by mid 1994 and available to support the handover program thereafter

TABLE D3

Municipal Water Supply Systems

S N	Town	93/94 Pop.	Source & Techn.	Actual Pop Served	Donor Agency	Served % of Pop.	Year of Completion	Age of System
1	Bhadrapur	17331	Ground Water	17331	JICA	100	91-92	1 Yr
2	Bharatpur	67163	Gravity & Ground Water	64531	JICA	96	91-92	1 Yr
3	Bidur	19456	Gravity	5600	ADB	29		Under rehabilitation
4	Birendranagar	26601	Gravity	23500	DWSS	88	82-83	10 Yrs
5	Byas	20175	Gravity	11900	DWSS	59	80-81	12 Yrs
6	Damak	48149	Ground Water		ODA			Under Rehabilitation
7	Dhanagadi	52441	Ground Water	14169	JICA	27	91-92	1 Yr
8	Dhankutta	18256	Gravity		ODA			Under Rehabilitation
9	Dipayal	13248	Gravity	12000	ADB	91	87-88	Under rehabilitation
10	Gaur	23746	Ground Water	10000	DWSS	42	82-83	10 Yrs
11	Ilam	14374	Gravity	12825	JICA	89	91-92	1 Yr
12	Inaruwa	21158	Ground Water	11800	DWSS	56	82-83	10 Yrs
13	Jaleswor	18861	Ground Water	11700	ADB	62	82-83	Under rehabilitation
14	Kalaiya	18365	Ground Water	15000	ADB	82	78-79	Under rehabilitation
15	Kapilbastu	19031	Ground Water	15000	ADB	79	81-82	Under rehabilitation
16	Lahan	20988	Ground Water	19000	JICA	91	91-92	1 Yr
17	Mahendranagar	69420	Ground Water	15730	JICA	23	91-92	1 Yr
18	Malangwa	14790	Ground Water	12200	DWSS	82	82-83	10 Yrs
19	Rajbiraj	26662	Ground Water	24500	JICA	92	91-92	1 Yr
20	Tansen	12758	Pumping Surface water	12400	JICA	97	78-79	14 Yrs
21	Tribhuwannagar	32349	Gravity	30000	DWSS	93	82-83	10 Yrs
22	Tulsipur	21187	Gravity	19408	ADB	92		Under Rehabilitation

TABLE D4

Non-municipal Pumpe Systems

S.N.	NAME OF SCHEME	DISTRICT	DESIGN POP	ACTUAL POP	YEAR OF COMPLETION	AGE (YRS)
1	Akash Ganga	Siraha	12920		90	3
2	Siraha	Siraha	9025	7050	83	10
3	Dhalkewar	Dhanusa	3500	1880	81	12
4	Khayarmara	Mahottari	3600	2213	84	9
5	Palanchowk	Kavre	1615	1215	84	9
6	Simra	Bara	3600	5000	80	13
7	Anandaban	Rupandehi	13352	9964	90	3
8	Krishnanagar	Kapilbastu	9800	7313	83	10
9	Maharajganj	Kapilbastu	4711	350	87	6
10	Gularia	Bardia	16000	6500	78	15
11	Rajapur	Bardia	16280	5600	88	5
12	Bahadurganj	Kapilbastu	11623		91	2
13	Parasi	Nawalparasi	12008	8961	87	6
14	Bardibas	Mohottari	5000		90	3
15	Bharatpur	Dhanusa	10659		90	3
16	Sreepur	Kanchanpur	7411		91	2
17	Tilakpur	Kailali	2600		91	2
18	Karnaiya	Sarlahi	15300		92	1

TABLE D5

Large Complex Schemes with Design Population more than 7000

S.N.	NAME OF SCHEME	DISTRICT	DESIGN POP	PRESENT POP	YEAR OF COMPLETION	TYPE OF SYSTEM	AGE OF SYSTEM
1	Myanglung	Tehrathum	9682	6310	85	Gravity	8 Yrs
2	Sano Thuloa Dumba	Bhojphur	7194	5215	85	Gravity	8 Yrs
3	Lumdang	Bhojpur	21590		92	Gravity	1 YR
4	Teliha	Dhankutta	8640		81	Gravity	12 Yrs
5	Chuleban	Dhankutta	12000		79	Gravity	14 Yrs
6	Gaighat	Udaypur	7000		79	Gravity	14 Yrs
7	Bahundangi	Jhapa	14674	6670	87	Gravity	6 Yrs
8	Letang	Morang	9120	4145	87	Gravity	6 Yrs
9	Lalgad	Dhanusa	9791	7000	83	Gravity	10 Yrs
10	Chautara	Sindupalchowk	7426	4500	76	Gravity	17 Yrs
11	Makawanpurgadi	Makawanpur	9467		92	Gravity	1 Yr
12	Ambhanjyang	Makawanpur	7076		88	Gravity	5 Yrs
13	Pithuwa	Chitwan	25000			Gravity	
14	Singaul	Bara	13229		92	Gravity	1 Yr
15	Nijgad	Bara	19000		83	Gravity	10 Yrs
16	Chapakharka	Lalitpur	21130	9605	84	Gravity	9 Yrs
17	Lele	Lalitpur	7315		83	Gravity	10 Yrs
18	Danchi	Kathmandu	10500	7318	89	Gravity	4 Yrs
19	Sitapaila	Kathmandu	11882		89	Gravity	4 Yrs
20	Machegaon	Kathmandu	7350		84	Gravity	9 Yrs
21	Katunje	Bhaktapur	9300		78	Gravity	15 Yrs
22	Ramnagar	Mahottari	11800		90	Gravity	3 Yrs
23	Sripur	Mahottari	11656		91	Gravity	2 Yrs
24	Krishnanagar	Mahottari	9200		92	Gravity	1 Yr
25	Nirmal basti	Parsa	10793		90	Gravity	3 Yrs
26	Salyantar	Dhading	7600		79	Gravity	14 Yrs
27	Sisuwakhudi	Kaski	12002		91	Gravity	2 Yrs
28	Deurali	Kaski	7627		91	Gravity	2 Yrs
29	Sarahnkot	Kaski	12129	7277	85	Gravity	8 Yrs
30	Pragati Nagar	Nawal parasi	13302	9927	82	Gravity	11 Yrs
31	Deurali	Nawal parasi	7732	6696	85	Gravity	8 Yrs
32	Bhairabsthan Riddikot	Palpa	8653		89	Gravity	4 Yrs
33	Gadakot	Palpa	10395		89	Gravity	4 Yrs
34	Dhakabang	Arghakhanchi	8295		85	Gravity	8 Yrs
35	Kimdanda	Arghakhanchi	8500	6200	89	Gravity	4 Yrs
36	Wanladibarna	Arghachanchi	7737		85	Gravity	8 Yrs
37	Waling	Syangja	9955		87	Gravity	6 Yrs
38	Isma	Gulmi	10500	7839	85	Gravity	8 Yrs
39	Daraundi	Gorkha	13400		84	Gravity	9 yrs
40	Panchakule	Dang	11525		91	Gravity	2 Yrs
41	Rampur	Dang	13290		91	Gravity	2 Yrs
42	Beljhundi	Dang	18964		83	Gravity	10 Yrs
43	Bijaura	Surkhet	17163		92	Gravity	1 Yr
44	Latikoilee	Surkhet	12289		91	Gravity	2 Yrs
45	Garayala	Rukum	8104		90	Gravity	3 Yrs.
46	Jajarkot	Jajarkot	9649	6465	85	Gravity	8 Yrs
47	Mudekapilekhi	Doti	9735	7264	85	Gravity	8 Yrs
48	Mudbhara	Doti	7446		92	Gravity	1 Yr
49	Mangalsen	Achham	9549	4066	85	Gravity	8 Yrs
50	Vyasi	Bajhang	7225		91	Gravity	2 Yrs
51	Ajayameru	Dadeldura	8368		91	Gravity	2 Yrs

TABLE D6

Large Scheme with Design Population Between 5000 to 7000

S.N.	NAME OF SCHEME	DISTRICT	DESIGN POP	PRESENT POP	YEAR OF COMPLETION	TYPE OF SYSTEM	AGE OF SYSTEM
1	Chhathar Pokhari	Terathum	6000	4000	84	Gravity	9 Yrs
2	Bhojpur	Bhojpur	5000	3632	77	Gravity	16 Yrs
3	Kulungdanda	Bhojpur	5325	3875	88	Gravity	4 Yrs
4	Rumjatar	Okhaldhunga	6225		85	Gravity	8 Yrs
5	Kurule Tenupa	Dhankutta	6350		84	Gravity	9 Yrs
6	Balkot	Bhaktapur	5378	4000	84	Gravity	9 Yrs
7	Tathali	Bhaktapur	6784	5000	89	Gravity	4 Yrs
8	Sidhipur	Lalitpur	6250	5000	75	Gravity	18 Yrs
9	Amlekh Ganja	Bara	5000	5000	68	Gravity	25 Yrs
10	Naikap	Kathmandu	6000		91	Gravity	2 Yrs
11	Batase	Sindhupalchowk	6956		87	Gravity	6 Yrs
12	Panchkal	Kavre	5800		80	Gravity	13 Yrs
13	Lakuwabudathum	Dhading	5458	4057	83	Gravity	10 Yrs
14	Sandhikharka	Argakhanchi	6900	5000	84	Gravity	9 Yrs
15	Belkot	Argakhanchi	5400	8700	78	Gravity	15 Yrs
16	Pali	Argakhanchi	5333	3980	81	Gravity	12 Yrs
17	Beldiha	Nawalparasi	5000	5240	79	Gravity	14 Yrs
18	Mithu Karam Naran	Nawalparasi	6886		90	Gravity	3 Yrs
29	Bandipur	Tanahu	6000	6000	63	Gravity	30 Yrs
20	Purkot	Tanahu	5251		85	Gravity	8 Yrs
21	Litung	Gulmi	5645	4211	85	Gravity	8 Yrs
22	Wami	Gulmi	5100	3806	84	Gravity	9 Yrs
23	Duradanda	Lamjung	5651	4051	85	Gravity	8 Yrs
24	Manapang	Kaski	6403		90	Gravity	3 Yrs
25	Muchhok	Gorkha	5331		83	Gravity	10 Yrs
26	Kusma	Parbat	6424	4294	79	Gravity	14 Yrs
27	Baglung	Baglung	5250		78	Gravity	15 Yrs
28	Bihukot	Baglung	5818	3570	89	Gravity	4 Yrs
20	Rakhu	Myagdi	5430		73	Gravity	20 Yrs
30	Sihuna	Kalikot	5135	3927	84	Gravity	9 Yrs
31	Malneta	Salyan	5570	5157	88	Gravity	5 Yrs
32	Rukumkot	Rukum	5424	4744	88	Gravity	5 Yrs
33	Chaurjhahari	Rukum	6968	6334	83	Gravity	10 Yrs
34	Manma	Kalikot	5500		88	Gravity	5 Yrs
35	Ridikot	Acham	5250	3918	63	Gravity	30 Yrs
36	Timilsain	Acham	5116	3818	86	Gravity	7 Yrs
37	Dadeldhura	Dadeldhura	6158	4580	81	Gravity	12 Yrs
38	Bhajani	Kailaly	6000		92	Gravity	1 Yrs
39	Bhumirajmandu	Doti	5292	3949	88	Gravity	5 Yrs
40	Haldukhal	Kanchanpur	5000		84	Gravity	9 Yrs

REVIEW OF DWSS MANAGEMENT INFORMATION SYSTEM.

There are several standard reports prepared and compiled by different sections of DWSS The key management information reports prepared and database systems are as follows:

1. Annual District Report

This report is prepared annually by DWSOs The report contains detailed description of the status of completed and ongoing projects, proposed/ surveyed projects, staffing, materials in stock and the financial summaries (overall project wise and administrative budgets and expenditures) of the last FY Based on these reports and yearly work plans , Planning section prepares the following annual summary reports

i) summary listing of the completed projects in different districts grouped by region and geographical area
ii) Coverage Status Report (Annual and Cumulative)

This report is frequently used by DWSS, MHPP and NPC for preparation of plans and budgets However the reporting from districts is irregular and incomplete

2. Trimester, Eight Monthly and Annual Progress Report.

These are the regular project implementation progress monitoring reports prepared in the standard format prescribed by NPC DWSS compiles the progress reports received from DWSOs and Project offices and sends them to MHPP and NPC

The activities targeted for each trimester in the annual work plan is monitored as a trimester progress report Eight Monthly progress report is the summation of the first and second trimester progress report whereas the annual progress report is the cumulative of all three trimester progress reports

3. Project Inspection Report

This report, also known as Construction Supervision/Quality Control Monitoring Report, is prepared by District Engineers, Regional Director or other supervising officials after inspection visits to each project The supervisor is to inspect the ongoing or completed works, identify problems, recommend solutions and report their findings to the Regional and Department level This report may contain recommendations for actions required either at the department or ministry level

The information covered in the DWSS inspection reports includes salient features of the project activities of the WUC, problems encountered by the project, physical progress and expenditure to date, construction quality of structures under construction and suggestions for solving problems if any

4. Project Handover Report.

DWSOs report to DWSS as soon as the project is na led over to the user committee This report is basically a copy of handover agreement signed bet een DWSO and WUC

B. Computer based MIS Reports

For improved data collection and analysis to monitor the different management aspects, the framework for computer based management information systems has been initiated after Management Information and Technical Support (MITS) project. UNDP/World Bank supported " MITS" project was formulated to develop a systematic approach to collect, process and disseminate information to water sector agencies and donors using computerised data management systems to improve planning, monitoring and coordination of the activity

Management Information Systems (MIS) developed under MITS project are (5-9) :

5. The Project Inventory System

The Project Inventory System contains detailed information on ongoing and completed projects including location, implementing and donor agencies, start and completion years, status of completion, population covered, costs, services provided, and community involvement It also contains summary technical information of the projects like number of schemes, source type, design flow, reservoir size, pipe length and number of taps.

The project inventory system initially collected data on all systems, including those funded and implemented by NGOs, but NGOs stopped reporting in 1991 after the MITS project ended Reports produced by the system for management include (1) detailed individual project information, (2) project listings with selected information, and (3) summary reports showing number of completed projects and coverage of different agencies in various standard formats.

The system needs to be updated by including the projects of all the agencies in the sector

6. Bi-Monthly Progress Monitoring System:

This system monitors the overall progress of DWSS water supply projects every two months System provides information on the physical and financial progress of each project on a bi-monthly and cumulative basis. Reports to management produce summaries by district, region and total DWSS 5 bimonthly reports are prepared in a year (First Bimonthly report covers first four months of the FY).

Note Following three database systems (7,8 & 9) were also developed and improved during MITS Project, but these systems are not in use at present.

7. Trimester Progress Implementation monitoring and Program Budgeting system.

This system was developed to computerise the standard NPC progress reporting formats The system is no more in use because of the frequent change of standard formats by NPC and the requirement to prepare standard reports in Nepali.

8. Stores Inventory System

This system was developed to computerise the inventory of construction materials and spare parts for DWSS and NWSC. The system is not in use as the formats developed are different from that prescribed by AGOs and storekeepers were not trained to use the systems

9. Personnel Inventory System

This system was an attempt to computerise the personnel records of the DWSS Staff. Informations of some officers working at centre was computerised initially. However there was no updating and the system is not in use

10. Monthly Financial Statements:

All offices under DWSS prepare the monthly financial statements and maintain account books in the standard financial and accounting report formats as prescribed by AGO. The copy of financial statement is sent to DTO, RD, DWSS and MHPP. The statement includes budget headwise expenditures of different projects and the financial status.

11. Internal/External Audit Reports:

Internal Audit reports are prepared by DTOs after auditing District books and financial statements prepared every month. A copy of this report including the list of unresolved irregularities is sent to RDs and DWSS Critical irregularities are identified and DWSS instructs the DWSOs for necessary actions

External auditor reports are prepared after final audit of the all district books at the department Sometimes spot auditing is also done. The auditor general submits the annual audit report to His majesty the King, which is then forwarded to the Parliament. The Public Account Committee of Parliament discusses the report in presence of MHPP Secretary and DWSS director general

12. Monthly Expenditure Report :

Apart from standard detailed monthly accounting reports, DWSOs prepare Monthly Expenditure Reports at the end of each month and submit to DWSS by quickest possible means of communication This report reflects the annual budget of the project/district, total budget released and expenditure incurred up to the reporting period DWSS and RDs summarize the total expenditure for that month and cumulative expenses till that month from this report

13. Personnel Information :

Administration section of DWSS and DWSOs maintain records of staffing, recruitment, promotion, retirement, transfer and trainings. Any recruitment (temporary or permanent) promotion, retirement, transfer and trainings is to be recorded and reported to supervising offices. All record keeping is done manually and it is not systematic.

General Comments:

- There is emphasis only on meeting the deadlines for submission of progress report. No mechanism to cross check the progress reports sent from project offices hence the chances are high that data are often not accurate.

- No compilation/summarization of progress reporting is done at any level. Reports sent by different DWSOs are simply put together, photocopied and sent to MHPP and NPC.

- Reviews at Departmental, Ministerial and NPC levels have beome ritualistic. Rarely effective corrective measures are undertaken.

- The progress reporting formats are changed very frequently leading to confusion at the field level. Most of the field staff are not familiar with the formats and do not know how to fill them.

- MIS is limited to construction progress (project implementation) and expenditure monitoring MIS is mistakenly regarded as
    a) only filling forms for progress and expenditure report to send them to higher levels
    b) compilation of data and computerisation.

- Monitoring role of the different agencies like DWSS, MHPP and NPC is not clear Same indicators and formats are being using by all for monitoring.