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DRAFT ANALYSIS REPORT

Presented to the World Bank



NEPAL RURAL WATER SUPPLY AND SANITATION SECTOR STUDY

Modalities of Service Delivery, their Features and Options to Efficiently Increase Access and Sustainability

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Executive Summary

This report provides an analysis of the different modalities and modality elements used in the rural water supply and sanitation programming in Nepal based on a field survey carried out in the winter 2012-2013 and secondary data.

The Modality Analysis Report reflects on the processes and the results, and focuses more on modality elements than on the overall modalities, because it is well realised that there are also wide differences within the four modalities, especially with the two departments and the NGOs. By comparing the different key modality elements to project functionality, service level and other factors, conclusions are drawn on the key elements of successful and sustainable implementation modalities in the Rural Water Supply and Sanitation Sector in Nepal. These findings form the basis for formulating the Options Analysis Report proposing future options for improving efficiency and sustainability in the sector.

The survey sample size and geographical distribution of the survey were decided through a series of project Review Committee and Task Force meetings in consultation with the study team during the Autumn 2012. Geographically the schemes were selected from 15 districts representing 3 ecological regions and 5 development regions. It was also agreed that selection of schemes should be done in such a way that it ensures capturing "mix of the complexity" and that the study would survey schemes completed between 1996 and 2007.

Survey Sample

Modality	Eastern		Central		Western		Mid Western		Far Western		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
DWSS	11	5	17	8	16	8	10	5	17	8	71	35
DoLIDAR	12	6	3	1	13	6	9	4	14	7	51	25
RWSSFDB	3	1	18	9	10	5	5	2	5	2	41	20
NGO	1	0	6	3	8	4	11	5	12	6	38	19
Total:	27	13	44	22	47	23	35	17	48	24	201	100
Rural community schemes												
DWSS	8	4	16	8	16	8	9	5	16	8	65	34
DoLIDAR	12	6	3	2	13	7	9	5	14	7	51	26
RWSSFDB	2	1	18	9	10	5	5	3	5	3	40	21
NGO	1	1	6	3	8	4	11	6	12	6	38	20
Total:	23	12	43	22	47	24	34	18	47	24	194	100

The limitations of the survey included the fact that the studied modalities are not in fact uniform, reliability and availability of data, large and varying error-margins and survey questionnaires missing linkage to some of the issues to be studied. Further, the study has little relevance for sanitation as the approaches have changed totally since 2007. These limitations led to problems in addressing some of the issues set-out in the ToR.

Modalities

The key modality elements of the studied modalities are defined on basis of the survey and secondary data as follows. The DWSS and DOLIDAR modalities are split into the regular programs of these government agencies and the donor funded projects working under these agencies as some clear differences in terms of implementation modalities, support mechanisms and fund flows exist the government programs and aid projects.

Modality Elements	DWSS	DWSS projects	Dolidar/MLD Projects	DDC-VDC	Fund Board	NGOs
a) Distribution of tasks						
a.1. Governance, selection, coordination	Agency/ DDC	Agency/ DDC	DDC-VDC	DDC-VDC	SO	DDC, NGO
a.2. Engineering	Agency	Agency	Agency/SO	Agency/User	SO	Agency/SO
a.3. Capacity building, social support	Agency/ NA	Agency	Agency / SO	Agency / NA	SO	Agency/ SO
a.4. Procurement	Agency	Agency	Agency/ SO+User	Agency / User	User + SO	Agency/ User+ SO
a.5. Construction	Contractor	Contractor/ User	User	User	User	User
b) Engineering support						
b.1. Engineering standards	Elaborate	Elaborate	Elaborate	Minimal/NA	Elaborate	Elaborate
b.2. Engineering standard application	Varying	Strict	Strict	Minimal/NA	Strict	Strict
b.3. Engineering support & supervision	Varying	Varying	Varying	Minimal/NA	Varying	Varying
c) Socio-institutional support						
c.1 Socio-institutional standards	Elaborate	Elaborate	Elaborate	Minimal/NA	Elaborate	Elaborate
c.2 Socio-inst standard application	Varying	Strict	Strict	Minimal/NA	Strict	Strict
c.3 User Capacity building	Low	Elaborate	Elaborate	Minimal/NA	Elaborate	Elaborate
d) Fund flow	GON-system, low budget	GoN system	GoN system	GoN-system (over 1 year : no problem)	Direct to UC, no obstacles	Direct to UC, no obstacles
e) Accountability arrangements	Minimal, GON audit	Public audit	Public audit	NA	Public audit	Public audit
f) Post-construction support	Minimal, DWSS-link	Training, MF, DWSS-link	VDC link, Training, MW, MF	VDC link	Training, MW, MF	Training, MW, MF

Financial modality elements

The survey and available secondary data on rural schemes show that there is relatively little difference in per capita cost among the different agencies. It is, however, difficult to judge the actual cost effectiveness of schemes based on per capita cost indicator. Cost effectiveness depends on variety of factors like quality of materials, remoteness of the schemes and the technology used.

Modality	Field Data		Secondary data	
	No. of Sample Schemes	Per Capita Cost	No. of Schemes	Per Capita Cost
DWSS:			3933	4,282
- including Small Towns	65	4,107		
- excluding Small Towns	61	3,161		
DoLIDAR	44	3,354	200	4,184
Fund Board	40	3,449	416	3,215
NGOs	34	3,377		
• HELVETAS			38	3,906
• NEWAH			66	5,727

Process and Institutional Modality Elements

Various elements related to the implementation process, technical aspects and institutional issues as well as efforts to ensure women's and marginalized group participation were covered by the survey. It was found that the RWSSFDB and NGO schemes had on average a bit more of such processes and institutional efforts in place while DOLIDAR (DDC-VDC) had the least.

Functionality

In terms of **institutional functionality** only about one third of the studied schemes still have some institutional structures such as active WUSC or VMW present. Generally the NGO- and RWSSFDB schemes have more often these institutional structures intact and the DoLIDAR (DDC-VDC) the least.

Functionality Indicator	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	%
1) WUSC Reformation year after 2007	31	14	28	37	27
2) Any Meetings held last year	31	22	38	42	32
3) WUSC Decisions are Implemented	31	25	50	55	38
4) O&M Fund has been spent during last 12 months	12	8	25	11	13
5) VMW monitors scheme at least annually	45	25	35	39	37

Tap functionality was taken as one measure for technical functionality. The study found that non-modality factors have a considerable effect on functionality - the

schemes in less poor and less remote areas are working better and the newer schemes have better tap functionality than old ones.

There was no notable difference found between the agencies in terms of tap functionality. But there was a visible correlation with WUSC training, registration and the existence of maintenance funds.

Modality or modality element	Sample	% Tap working
UC receiving any training	102	74%
UC Not Trained	88	73%
Maintenance fund	85	82%
Non-Maintenance fund	107	67%
UC Registered	69	82%
UC Not Registered	121	69%
DWSS schemes	65	73%
Dolidar schemes	51	76%
FB schemes	38	72%
NGO schemes	38	75%
Overall	192	74%

Following the elaborate guidelines conscientiously increases the chance of sustained scheme success, but the fact that low-effort DDC-VDC schemes do not perform significantly worse than the others suggests that other factors are just as important. This may be due to more community ownership and participation from the beginning as well as the possibility for learning-by-doing during the implementation and linkage to VDC-DDC systems.

Service level (QARQ) was also studied as a complex indicator for functionality and provided service level. The analysis of service level covers 5 aspects of water supply service – **Q**uantity of water, **A**ccessibility in terms of distance, year round **R**eliability, **C**ontinuity (hours per day) and **Q**uality of Water.

Category	% schemes with Good Q uantity score	% schemes with Good A ccess score	% schemes with Good R eliability score	% schemes with Good Q uality score	% schemes with Good QARQ score
DWSS	65	58	88	80	32
Dolidar	69	63	91	76	29
RWSSFDB	78	65	95	63	35
NGO	82	74	86	82	47
FW & MW	69	53	83	72	28
W&C&E	74	75	97	79	41
1996-2001	66	58	88	75	31
2002-2007	72	76	88	83	42
Mountain	84	66	85	64	38
Hill	66	64	92	82	36

Terai	73	62	91	69	27
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Overall the service level of the studied schemes was surprisingly good – about two thirds of the studies schemes had good or acceptable service level. Less than 10% of the studied schemes had very poor service level and there were only two schemes totally out of service. There were relatively small differences between the ecological zones – only notable difference being the relatively lower quantity and higher quality of water in the Hills. There was more clear difference between the Far- and Mid-West and the other regions with Far- and Mid-West having generally lower service level. This was also clearly the case with older schemes.

Service level is affected by the following:

- payment for materials by the WUSC leads to slightly better sustained service level,
- the registration of WUSC and following processes such as community action planning as well as sustained activity of WUSC correlate with higher service levels,
- quality of materials has a clear correlation with better service level but the correlation with better service provider and workmanship is not as pronounced,
- a sustainably active WUSC has a clear correlation to above average service levels.

Reasons for functionality problems

Among the reasons for system functionality problems the low managerial and technical skills at scheme and WUSC level is the most often mentioned, followed by absence of VMW/operator. The lack of proper support services is also among the commonly cited reasons for functionality problems. Non-modality factors such as location and age also have a clear correlation. Natural calamities and source depletion don't come out as very recurrent causes for problems in the studied schemes.

Reasons for Functionality Problems	Total Resp.	In Good Condition	Need Rehabilitation	Unusable Scheme
		%	%	%
Low Technical Skills at Scheme Level	111	22	75	4
Absence of VMW or Operator	94	20	78	2
Inadequate Managerial Skills of WUSC	116	16	81	3
Lack of Support Services	93	16	83	1
Poor Design/Construction Quality	46	15	83	2
Increased Number of Public Taps or Illegal Private Connections	9	11	89	0
Depletion of water source	21	29	71	0
Natural Calamities	34	21	74	6
Others	28	18	82	0
Total:	552	19	79	2

Gender and equity issues

Gender-related efforts and results are higher in NGO and RWSSFDBsupported schemes. Findings on support to vulnerable groups did not show clear differences among modalities and overall there was very little effort found to support their participation.

Indicator	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	%
% schemes in which women were involved in deciding Tap Stand	68	73	75	84	74 %
% schemes where women were present during public audit	9	12	38	32	20 %
% schemes where women are chairperson	0	2	0	11	3 %
% schemes with female VMW	2	2	0	0	1 %
% schemes with female tap stand care takers	31	39	50	53	41 %

NMIP database provides data on participation of women in WUSCs and data on scheme functionality. The data suggest that non-inclusion of women results in lower functionality.

Table 4-31 % of women in WUSC compared to functionality (NMIP)

% women in WUSC	No. schemes	Functionality Score
0%	2284	3.3
1-10%	409	3.4
11-20%	3856	3.5
21-30%	5015	3.5
31-40%	1585	3.7
41-50%	698	3.6
51-	400	3.5

Source: NMIP (MoUD). Functionality score is based on conversion of scheme condition categories to scores (e.g. 5 for well-managed, 1 for needs reconstruction)

Strengths and weaknesses of the modalities

The following SWOT table shows the relative strengths and weaknesses of the four studied modalities, based on the results of the survey, secondary data, existing reports and discussions with stakeholders.

Agency	Strength	Weakness
DWSS	Engineering know-how	Focus on construction and finance as these are the main GoN progress indicators
	Post-project presence at district level,	Fund flow mechanism (slow and tied to annual allocations)
	Long term presence enables operation in remoter areas	Less flexibility in implementation modes
DDC-VDC	DIY modality engenders user ownership	Low level of following processes or providing support (trainings, workshops) and sustained institutions

	District Ownership	
	Post-project presence at VDC level	Low levels of accountability and lack of systems for follow-up and support
		Lack of records and monitoring
Fund Board	Elaborate processes	Less Mid-West, less remote
	Using Lessons to improve modalities	Low level of integration with GoN-led coordination and planning system
	Uniformity across the programme	High dependence on Local Support Organisation. Regional and district absence during implementation
		Post-project absence
NGOs	More software support to users	Less remote areas
	Diversity allows cross-fertilization	Post-project absence
	More Mid-West	Donor-dependence
	Regional and district presence during implementation	Dependence on Local Support Organisations

Conclusions

The lessons of the study are more valid where they concern specific modality elements rather than the differences between agencies. The findings suggest that functionality is for a large part determined by non-modality elements (region, geography, age, size) rather than the followed processes. We can see that the difference between the studied agencies/modalities is not large in terms of cost effectiveness, functionality and sustainability but there is clear correlation with some modality elements and processes and better sustainability of schemes. Such key elements should be focused on and ensured by all agencies.

Important elements seem to be: a) Capacity Building and sustained activity of WUSC, b) O&M arrangements (Maintenance Fund, VMW, tools and spare parts), c) Degree of participation (in planning, procurement, construction and O&M) and do-it-yourself nature of schemes, d) scheme simplicity, e) link to VDC/DDC, f) Post-construction environment (WUSC and local technical capacity and linkages), g) quality of construction materials as well as local support and supervision.

The survey showed considerable discrepancy between NMIP scheme-wise data and field findings. E.g. the number of households differed from NMIP records by an average 30% (too high/low). Over 5% of schemes selected from NMIP data were not found at all in the field or in district level databases. There was also a large number of schemes (about 25%) where NMIP functionality status and surveyed service level were extremely different.

Coordination and governance

The survey and secondary data suggest that coordination by and linkage with local governance structures is essential for sustainability of intervention results. Such linkages enhance continued backstopping and support to the users as well as increase opportunities for financial support when larger repairs are needed. This concerns mainly the VDC and the DDC. The DWASH CC and VWASH CC structures have only been instituted after the studied period and are too new to make conclusions. Another key

aspect for coordination is the networking of users' organisations. The Federation of Drinking Water and Sanitation Users Nepal (FEDWASUN) is the umbrella organization for WUSCs in Nepal that facilitates the cross learning between WUSCs and supports continued provision of services to communities through training and advocacy. Further strengthening of the federation and linking all WUSCs to such networks could strengthen the WUSCs' capability to work as sustainable service providers.

GESI/Poverty Focus

NMIP and study data suggest that women's inclusion in planning and management is beneficial. Also the schemes in poorer and remoter areas have lower levels of functionality. The seeming contradiction that guidelines have been followed less in the more advantaged eastern half of the country, but that schemes there in general perform better has to be studied in more detail. This may be partly due to more recent focus to Far- and Mid-West and with more NGO and donor project support where processes are followed more strictly but due to other factors the results have not always been as good as in other regions. Further study of existing data should establish whether communities in the Far- and Mid-West require less intensive support because they have become too agency-dependent or that they need more support.

Capacity building

The study findings suggest that that intensive capacity building increases the chance of sustained scheme functionality. On the other hand does the do-it-yourself (DIY) modality, which lacks agency-led capacity building also produces reasonable results. The study was too limited to provide detailed insight in to which level and type of capacity building is suitable for which set of local conditions. The main lesson seems to be that a project should allow the users to build capacity and find a balance between local ownership and agency support. Also the continued WUSC managerial capacity as well as locally available technical capacity were found to have linkages to better functionality.

Technology

The study covered schemes using conventional agency-promoted technology. The exact technology need per scheme could not be studied. In many cases the DIY modality of mainly just providing building materials leads to well-functioning schemes, in other cases local people cannot maintain high-tech schemes and many of the larger high-tech schemes with a lot of individual household taps and more professional management tend to keep functioning well. Also in some cases high-tech and high per capita cost technologies are the only solution for hard-to-reach communities due to scattered household and far distant water source (e.g. lift schemes, Rain Water Harvesting).

User participation

Where communities are expected to maintain the scheme, user participation should be maximum, with users getting a chance to lead the project intervention and to gain the required experience and skills and resources to maintain the scheme. The relative success of DIY schemes is an indicator for this. Projects should be designed to avoid domination or the development of patronage relations by agencies and local support organisations. Users' participation and ownership is important for sustainability and continued functionality of the projects. The study results showed that WUSC

registration, involvement in procurement and continued WUSC activity after the project period lead to better than average functionality and service level. This indicates that promoting active user participation at all stages of project planning and implementation is important for sustainable results.

Private sector

The involvement and development of the private sector has been notably absent from most project efforts, while scheme maintenance normally would depend on the availability of materials and quality repair services.

Hardware tasks

As the study findings are based on recollection of users years after the implementation of the scheme, there can only be a partial analysis of how effective the task divisions are regarding hardware, e.g. scheme design, supervision and technical capacity building.. These tasks have been assigned to either agency staff or local support agencies. The former are often too busy to focus on a scheme very thoroughly, while the latter often lack the skills and accountability. Secondary information sources and stakeholder discussions show that hardware support remains inadequate when provided by local support organisations or technical experts visiting from outside the district. It is probable that hardware services should be provided by the district level and VDC-level agencies, probably by extra staff hired for the project, but integrated in the agency structure. The study did find that continued presence of a paid village maintenance worker (VMW), sufficient tools and spare parts at the schemes level and better construction material quality leads to sustained functionality and improved service level.

Software tasks

Similarly to the hardware tasks, the study findings allow only a partial analysis of how effective the task divisions are regarding software, e.g. scheme design, supervision and technical capacity building. These tasks have been assigned to either agency staff or local support agencies. The former have limited time to properly conduct these activities, while the latter often lack the skills and accountability, although less so than in the case of hardware. Secondary information sources and stakeholder discussions show that software support remains inadequate when provided by local support organisations or technical experts visiting from outside the district, if not properly supervised by the local agency. The problems in quality delivery of training and other software support during construction also lead to lack of sustainable institutions and technical and managerial capacity and manpower at the scheme level, only about 30% of studied schemes had a registered WUSC. These are seen as the most common reasons for system functionality problems. The study found that the most important software related elements leading to better functionality are the continued registration and activity of WUSC, users' participation, sustained managerial and technical capacity at scheme level (WUSC, VMW) and continued O&M fund collection.

Finance and Fund flow

The study findings suggest that investment levels are roughly equal among agencies when their effort levels are comparable. The fact that Fund Board and NGO results are slightly better suggest that overall cost-effectiveness is slightly higher for these

modalities, though DOLIDAR's service level also fares well. Fund flow issues were only studied through secondary sources, which suggest that obstacles to smooth fund flow in government agencies might be an important cause of slightly slower and less structured implementation and resulting lower functionality levels in government supported schemes, even those implemented under specific projects. It was also found that the involvement of users in material procurement can be beneficial.

Reasons for functionality and service level issues

The reasons for functionality problems were studied to the extent possible. From the studied schemes it is seen that there is a mix of reasons – both non-modality and modality elements. There seems to be a clear correlation with some of the non-modality elements such as the ecological zone and development region with sustained level of service and functionality. Environmental calamities such as landslides and source drying are seen as a major issue in a surprisingly low percentage of schemes. The most important modality elements for sustained service are institutional issues such as presence and capacity of active WUSC and VMWs etc.. Technical quality of work and materials is the second most important modality aspect in terms of sustained service.

These findings form the basis for the Options Analysis Report proposing future options for improving efficiency and sustainability in the sector.

1. Introduction

The present study is meant to inform the development of options for improvement of the WASH sector, mainly development of new WASH sector projects and WASH sector integration.

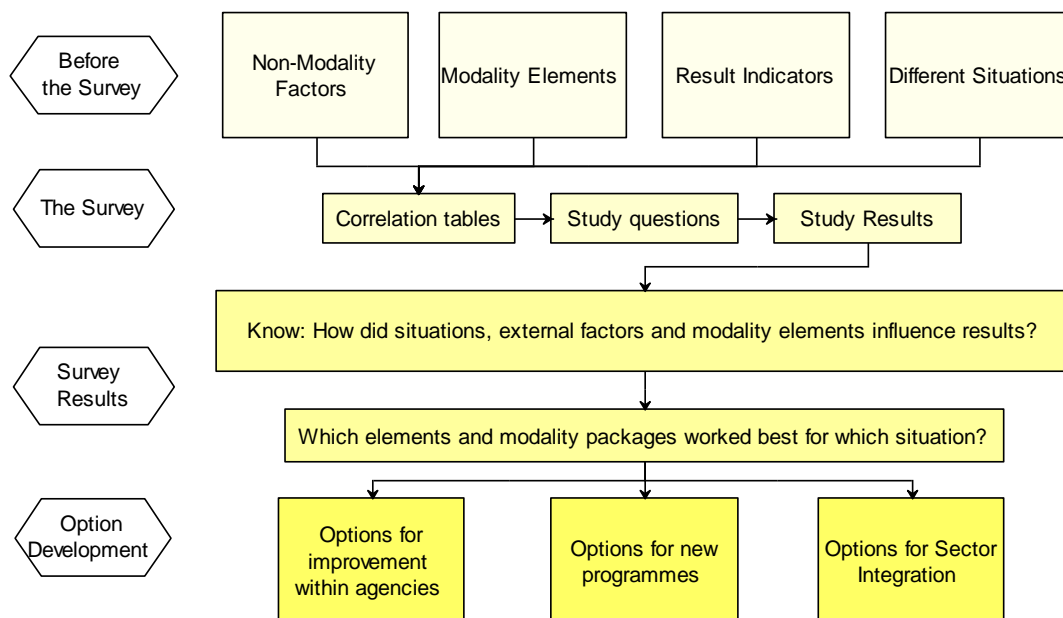
2. Methodology

This report analyses the different modalities and modality elements used in the rural water supply and sanitation programming in Nepal based on the field survey carried out in the winter 2012-2013 and secondary data.

The sample size and geographical distribution of the survey were decided in a series of discussions and meetings by the project Review Committee and Task Force in consultation with the study team during the Autumn 2012. Geographically the schemes were selected from 15 districts representing 3 ecological regions and 5 development regions. It was also agreed that selection of projects/schemes should be done in such a way that it ensures capturing “mix of the complexity” and that the study would survey 200 schemes completed between 1996 and 2007. This range of scheme age was selected to avoid studying very old schemes that have mostly been replaced already as well very new schemes where the issues and problems of functionality have not yet fully materialized. It was also concluded that many of the modalities to be studied (DoLIDAR, FB and many NGOs) had started work around 1996 enabling comparison from that year onwards. The sample would consist of 76 schemes of DWSS, 47 schemes from Dolidar¹ and Fund Board each and 30 NGO² schemes.

The logic of the study implementation is shown in the figure below.

Figure 2-1 How the Study contributes to Option Development



¹ The Dolidar modality consists of 3900 VDC-, 2245 DDC-, 596 FINNIDA/Dolidar- and 51 Dolidar supported schemes

² NGO schemes were selected from 487 NEWAH-, 647 Helvetas- and 500 CARE-supported schemes in the database

There were some issues with the selected schemes during the field survey. Of the 200 randomly selected schemes 51 were changed during the survey – mainly these were changes in the scheme name or location, but a number of schemes had to be replaced by alternative schemes because e.g. the primary scheme could not be found, was not accessible due to snowfall, or was completed later than 2007. Mostly the schemes were replaced by a scheme within the same modality but in many cases no such scheme could be found in time, and schemes from other modalities were selected. The ultimate sample composition changed as a result, but without affecting the representativeness of the sample. Due to these changes the final sample was 71 schemes from DWSS, 51 from DoLIDAR, 41 from RWSSFDB and 38 from NGOs. The total increased to 201 because one scheme was replaced by two others. The full list of changes in surveyed schemes is found in Annex 2.



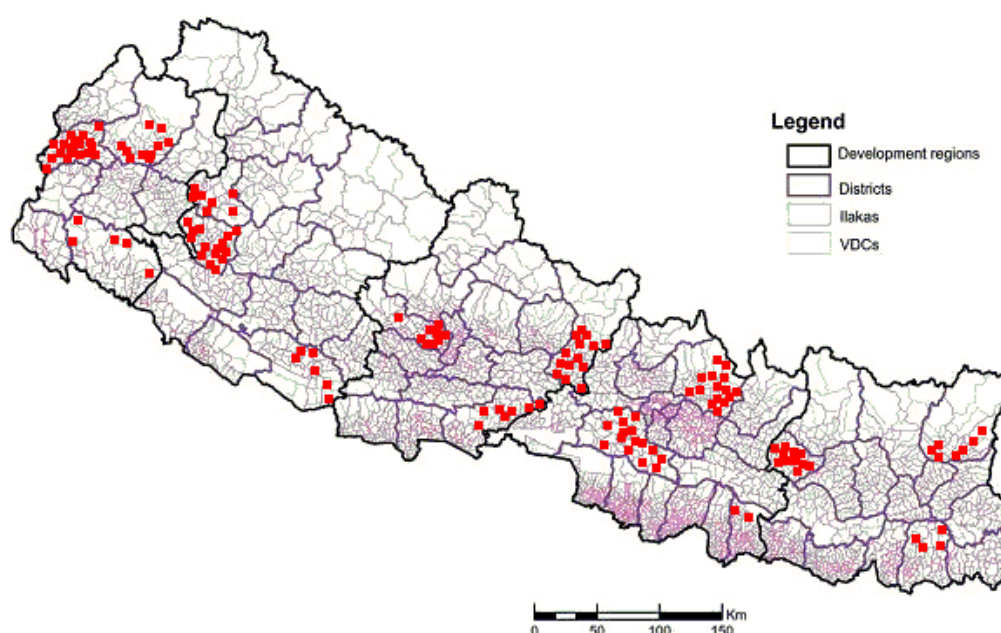
Interviewing users of Nakedanda W.S.P, Jaidi VDC, Baglung

The total increased to 201 because one scheme was replaced by two others. The full list of changes in surveyed schemes is found in Annex 2.

This Analysis Report will reflect on the processes and the results, and focus more on modality elements than on the four overall modalities, because it is well realised that there are also wide differences within the four modalities, especially within the two departments and the NGOs. By correlating different modality elements to project functionality and service level

conclusions are drawn on key elements of implementation modalities for improved effectiveness and sustainability in the Rural Water Supply and Sanitation Sector in Nepal. Findings were compared with secondary data, e.g. an analysis of the NMIP database (annex 4) or a study done by RVWRMP. Together these findings will form the basis for formulating the Options Analysis Report proposing future options for improving efficiency and sustainability in the sector.

Figure 2-2 Geographical distribution of the schemes surveyed



To allow equal comparison the more sophisticated and small town schemes (7) were excluded from some of the analysis. These large schemes were predominantly urban with a lot of house connections and a professional management organization so these were considered not comparable with the smaller rural schemes. The large schemes are analysed separately where deemed necessary. These schemes included small town schemes, 2 pumping overhead schemes as well as 2 large schemes in rural towns with a large number of private taps. Six of these schemes were implemented by DWSS and one by RWSSFDB. The final list of surveyed schemes is found in Annex 1. The table below illustrates the geographical distribution of all the 201 schemes as well as the 194 smaller rural schemes studied in more detail.

Table 2-1 Sample by Zone and Region

Ecological Zone	Eastern		Central		Western		Mid Western		Far Western		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Mountain	7	3	23	11	0	0	7	3	13	6	50	25
Hill	16	8	18	9	36	18	20	10	28	14	118	59
Terai	4	2	3	1	11	5	8	4	7	3	33	16
Total:	27	13	44	22	47	23	35	17	48	24	201	100
Rural community schemes												
Mountain	7	4	23	12	0	0	7	4	13	7	50	26
Hill	15	8	18	9	36	19	20	10	28	14	117	60
Terai	1	1	2	1	11	6	7	4	6	3	27	14
Total:	23	12	43	22	47	24	34	18	47	24	194	100

The table and map above show the study's focus on hill and mountain schemes. Also within the Terai the focus is on foothill gravity systems. In the mountain districts the studied schemes were concentrated mainly in the lower areas.

Table 2-2 Sample by Modality and Region

Modality	Eastern		Central		Western		Mid Western		Far Western		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
DWSS	11	5	17	8	16	8	10	5	17	8	71	35
DoLIDAR	12	6	3	1	13	6	9	4	14	7	51	25
RWSSFDB	3	1	18	9	10	5	5	2	5	2	41	20
NGO	1	0	6	3	8	4	11	5	12	6	38	19
Total:	27	13	44	22	47	23	35	17	48	24	201	100
Rural community schemes												
DWSS	8	4	16	8	16	8	9	5	16	8	65	34
DoLIDAR	12	6	3	2	13	7	9	5	14	7	51	26
RWSSFDB	2	1	18	9	10	5	5	3	5	3	40	21
NGO	1	1	6	3	8	4	11	6	12	6	38	20
Total:	23	12	43	22	47	24	34	18	47	24	194	100

2.1 Survey Limitations

The results should be reviewed in the light of limitations of the survey. There are limitations resulting from the character of schemes, from sampling and from the set-up and implementation of the survey.

Not Uniform Modalities

Although the report assesses four modalities, those modalities are not uniform in themselves. Firstly there are differences within each agency among projects and among NGOs and also between periods, as modalities evolved over time. Most schemes at the time of implementation followed modalities which are presently outdated. It should also be noted that the so-called DoLIDAR-schemes are actually DDC/VDC-schemes, mostly implemented at a time when the concerned agencies did not have any specific guidelines.

No Sanitation Modalities

The survey has very little relevance with regard to sanitation. At the time of implementation, sanitation modalities were either non-existent or vastly different from the current ones. Further, only result data were collected, not data on how exactly sanitation and hygiene were promoted in concerned schemes.

Reliability and Availability of Data

Some key data was difficult to retrieve or absent all together. Existing key data on 20% of the schemes proved incorrect. Other data also showed considerable discrepancy between NMIP scheme-wise data and field findings (Annex 2). E.g. the number of households differed from NMIP records by an average 30% (too high/low). Over 5% of schemes were not found at all in the field or in district level databases (Annex 2). Further, enumerators could only find key documents at district or community level for 20-30% of the studied schemes. Scheme and process data were therefore mostly based on recollection by users. Many of the interviewees had not been actively involved during planning and implementation. It was especially difficult to obtain sufficient and sufficiently reliable data on scheme-level finances.

Table 2-3 Availability of Documents

Modality	Sample	Key Documents found in district	Key Documents found with Users
DWSS	45	13%	11%
Dolidar	31	13%	6%
Fund Board	29	31%	17%
NGO	26	31%	38%
Total	131	21%	17%

Sampling and Error Margins

The schemes were selected from a part of the NMIP database, i.e. 15,251 schemes that were larger than 10 households, were completed between 1996 and 2007 and fell under the four studied modalities. The error margin for a response distribution of 50% at a confidence level of 95% for the whole sample is high at 7%, while it is very high for the different modalities (12-16%)³. Achieving error margins of 5% for each individual modality would have needed samples of around 350 schemes for each modality, totaling 1400 together.

Table 2-4 Margins of Error for the community schemes of 1996-2007

Study Selection	No. of schemes in NMIP data base	Sample size	Error margin
DWSS	7,439	65	12%
DDC-VDC	3,899	51	14%
Fund Board	2,434	40	15%
NGO	1,479	38	16%
Total	15,251	194	7%

Although the total quantity of existing schemes differs widely per modality, the survey samples would still need to be roughly equal if an equal error margin was to be achieved. E.g. for an error margin equal to that of DWSS' sample of 65 schemes (12%) even the 1,479 NGO schemes would have still needed a sample of 64 schemes.

The consequences of sampling are considerable. For example, if the survey finds that of the NGO schemes 50% have a functioning User Committee, the margin of error indicates this should not be read as 50% but actually as "between 34-66%". For the overall sample of 194 community schemes differences of more than 7% are taken as statistically significant, while for the NGOs the study will mostly take differences of 15% as significant, dependent on question, sample size and answers.

The table in the previous chapter shows that the majority of Fund Board schemes (75%) were taken from the East, Central and West, while the majority of NGO-schemes (62%) were taken from the Far- and Mid-West. This reflects the reality of all Fund Board schemes (more Central and West) and of all NGO schemes (more FW-MW) as shown in the table below, but it affects the survey statistics and reliability of the results because of the differences between the Far-/Mid-West and the East/Central/West in processes and results (see findings chapters further on).

³ Error margins and sample sizes were calculated using the website <http://www.raosoft.com/samplesize.html>.

Table 2-5 Presence in development regions (NMIP)

Description	% schemes in Far & Mid West	% schemes in East, Central & West
DWSS	30%	70%
DoLIDAR (DDC-VDC)	26%	74%
RWSSFDB	8%	92%
NGO	23%	77%
All	26%	74%
Population	22%	78%
HH with piped water supply (NLSS 2010 2011)	58%	71%
HDI 2010	0.397	0.483

Set-up of the Survey

The questionnaire design was not linked to clear indicators for functionality and modality. Some questions turned out later irrelevant, while at the same time some important modality or result-related questions were missing in the questionnaires. As a result, conclusions are not possible on all issues asked for in the ToR. This is exacerbated by the fact that for certain questions the numbers of responses were too low, resulting in error margins too high for making reliable conclusions.

The Consequences for Coverage of the Requested Aspects

Overall, the survey gives a reasonable basis for assessing correlations between various external factors, modality elements and functionality indicators, but much less so for a reliable comparison between the four overall modalities. The reader is therefore requested to be cautious when viewing differences between the four overall modalities (type of agencies) that are less than 10-15%.

The above limitations have also resulted in weaker assessment of for example policy and strategy compliance, governance at VDC and DDC level, gender, social inclusion and poverty-related issues, sanitation modalities and cost-effectiveness.

The study was asked to:

- Identify the gaps in policy/ strategies compliance,
 - The study could verify for most schemes which modality elements had been used, but assessing compliance against prevalent policies and strategies of that time was not possible as policies and strategies were either absent, varying with each modality or changing over time and even during project implementation. Moreover, standards and terminology have changed over the years, and e.g. the



Tap stand in Sunkhola W.S.P in Srikot VDC of Baitadi

terms "user training" or "public audit" meant different things in 1996, 2007 and 2013.

- Planning, budgeting, coordinating and reporting processes
 - The study could not adequately trace which planning, budgeting, coordinating and reporting processes had been followed, as too few responses came for related questions. Key documents were only found for about 20% of schemes.
- Fund flow mechanisms/financing and implementation arrangements,
 - Most of the modalities were very diverse in themselves. The Fund Board modality is the most consistent, even though it has also evolved considerably over the years. Responses on related questions were further very limited in number as users would not have sufficient knowledge about these matters.
- Community ownership/participation and levels of empowerment,
 - Few ownership and empowerment output and result indicators could be traced, the ultimate indicator being of course whether the scheme was still functional
- Cost effectiveness and qualitative assessment of functionality and sustainability of different implementation and service delivery modalities and their institutionalization
 - Functionality indicators, notably tap functionality and service level – QARQ (water Quantity, Accessibility, Reliability and Quality) form the core of the study and are correlated to various modality elements. Incomplete financial data from agency and scheme level affected the comprehensiveness of cost-effectiveness assessments.
- Governance and accountability mechanisms,
 - Full insight was affected by a lack of responses to relevant questions and omission of few key governance questions (e.g. the role of DDC and VDC in scheme selection, coordination and post-construction services)
- Performance of different implementation modalities in terms of GESI, pro-poor, reaching the unreached and equity considerations.
 - The study provides GESI-related modality data, but these cannot be properly used for lack of context, e.g. scheme-wise data on caste-ethnicity, poverty, pre-project needs and some other key socio-economic aspects. This could only be partly redressed by use of circumstantial evidence and proxy indicators.



Non-functional tap stand in Change Khola W.S.P. in Yamphudin VDC of Taplejung

The study will also shed light on the correlation between functionality and non-modality factors like size (hh), age, zone, remoteness, pre-project need, and initiator of project.

3. Introduction to Modalities

The table below summarises the range of implementation modes for different modality elements.

Table 3-1 The Range of Modality Elements

Modality Element	One side of the range	Opposite side of the range
• Coordinate, Govern	All thru VDC-DDC	Direct with users
• Process	Elaborate, strict	None at all
• GESI/Poverty Focus	Elaborate, strict	None at all
• Capacity building	Elaborate, strict	None at all
• Technology	High tech	Only pipes
• User participation	UC designs, pays, procures, builds	All by agency or SO
• Private sector	UC & private sector	UC, GOs and NGOs
• Hardware tasks	Agency & hired staff	Support Organisations
• Software tasks	Agency & hired staff	Support Organisations
• Fund flow	Via GO channel	Direct to Users
• Accountability	No audit	Public Audit

The following table summarizes the differences between agency-modalities regarding various modality elements based on the survey and the available secondary data. The DWSS and DOLIDAR modalities are split into the regular programs of these government agencies and the donor funded projects working under these agencies as some clear differences in terms of implementation modalities, support mechanisms and fund flows exist the government programs and aid projects.

Table 3-2 Modality elements comparison among the modalities

Modality Elements	DWSS	DWSS projects	Dolidar/MLD Projects	DDC-VDC	Fund Board	NGOs
a) Distribution of tasks						
a.1. Governance, selection, coordination	Agency/ DDC	Agency/ DDC	DDC-VDC	DDC-VDC	SO	DDC, NGO
a.2. Engineering	Agency	Agency	Agency/SO	Agency/User	SO	Agency/SO
a.3. Capacity building, social support	Agency/ NA	Agency	Agency / SO	Agency / NA	SO	Agency/ SO
a.4. Procurement	Agency	Agency	Agency/ SO+User	Agency / User	User + SO	Agency/ User+ SO
a.5. Construction	Contractor	Contractor/ User	User	User	User	User
b) Engineering support						
b.1. Engineering standards	Elaborate	Elaborate	Elaborate	Minimal/NA	Elaborate	Elaborate
b.2. Engineering standard application	Varying	Strict	Strict	Minimal/NA	Strict	Strict
b.3. Engineering support & supervision	Varying	Varying	Varying	Minimal/NA	Varying	Varying
c) Socio-institutional support						
c.1 Socio-institutional standards	Elaborate	Elaborate	Elaborate	Minimal/NA	Elaborate	Elaborate

Modality Elements	DWSS	DWSS projects	Dolidar/MLD Projects	DDC-VDC	Fund Board	NGOs
c.2 Socio-inst standard application	Varying	Strict	Strict	Minimal/NA	Strict	Strict
c.3 User Capacity building	Low	Elaborate	Elaborate	Minimal/NA	Elaborate	Elaborate
d) Fund flow	GON-system	GoN system	GoN system	GoN-system (over 1 year : no problem)	Direct to UC, no obstacles	Direct to UC, no obstacles
e) Accountability arrangements	Minimal, GON audit	Public audit	Public audit	NA	Public audit	Public audit
f) Post-construction support	Minimal, DWSS-link	Training, MF, DWSS-link	VDC link, Training, MW, MF	VDC link	Training, MW, MF	Training, MW, MF

The Overview Report provides further analysis on the modalities.. The table below, from the Overview Report, summarizes the key approaches for a number of modality elements for the four studied modalities.

Table 7 Characteristics of modalities

	DWSS	DoLIDAR	RWSSFDB	HELVETAS/NEWAH/ CARE
Selection of schemes by	DDC Assembly, DWSS	VDC and DDC Assembly	SO, VDC, DDC, RWSSFDB	VDC Assembly, DDC, NEWAH, CARE
CAP/PRA	PRA included	NA	both included	CAP / PRA / NA
WUSC/gender	at least 30% women (as per Strategy 2004)	at least 33% female re- presentation	at least 33% female re- presentation at least one key position to be occupied by a woman (usually a treas- urer)	All: at least 33% female representation HELVETAS: in practice 50% NEWAH: average 47% in already formed WUSCs CARE: maximum of 77% men
Social/ethnic inclusion	proportional representa- tion of gender, caste and disadvantaged ethnic groups			HELVETAS and NEWAH: proportional representa- tion of gender, caste and disadvantaged ethnic groups CARE: at least 25% de- pending on the local con- texts; proportionate to the population ratio
Financing	Due to political alloca- tion, projects with limited budgets take long to complete	Due to political alloca- tion, projects with limited budgets take long to complete	Enjoyed quite steady fund flows as long as WB financed	All: funds from project to users, no major delays CARE: 30% contribution by DDC/VDC
Main responsibility for planning	WSSDO/WSSSDO	SO, WUSC	SO, WSUC	SO, WUSC / NEWAH WUSC / SO, DWUSC
Main responsibility for design	WSSDO/WSSSDO	SO	SO	SO / SO or NEWAH, WUSC / SO, CARE, DWUSC

	DWSS	DoLIDAR	RWSSFDB	HELVETAS/NEWAH/ CARE
Main responsibility for capacity building	CHRDU	SO	SO	SO / SO or NEWAH / SO
Main responsibility for procurement	DWSS	WUSC, DTO/SO	WSUC	HELVETAS / NEWAH / DWUSC
Main responsibility for construction supervision	WSSDO/WSSSDO	DTO/SO	WSUC	SO / NEWAH / SO, NEWAH
Post construction support: performer and activities	WSSDO/WSSSDO: follow-up if requested, VMW training	DTO: training	SO, RWSSFDB: follow-up, monitoring, technical support, water quality monitoring	SO: follow-up, training/NEWAH: follow-up, advice/CARE: fund to O&M
Handing-over	handing over	handing over	no handing over	All: no handing over
Networking	FEDWASUN, VDC, DDC, WSSDO/WSSSDO	FEDWASUN, IGA promoters	NA	NA / VDC, V-WASH CC, FEDWASUN / DWSS
Specific	limited role of WUSCs in "regular" projects SOs not involved (design, capacity building, etc.)	WUSCs managing implementation strong reliance on SOs promotes income generation	WUSCs managing implementation strong reliance on SOs dependence on mainly Kathmandu-based SAs in technical aspects innovations over time	HELVETAS: requires contribution from involved NGOs has own regional offices WUSC's share responsibility for managing implementation NEWAH: has own regional offices WUSC's share responsibility for managing implementation CARE: focus on , poor and remote communities

3.1 Qualitative analysis of modalities

There is very limited comparison of the different agencies and their implementation modalities in the recent sector studies and assessments. The documents such as the Sector Status Report (2011), Sector Assessment Report (2011) and Assessment Report of Current Condition (2011) analyse the overall situation in the sector in terms of policies, coverage, functionality and major issues and areas for improvement. Apart from some financial analysis there is no comparison of the working modalities and agencies. These reports are further analysed in the Overview Report.

Some NGOs, e.g. Helvetas, have conducted functionality surveys of their own schemes but these do not include comparison among different implementation modalities. Finnish funded project RVWRMP (under DOLIDAR) also conducted a relatively large Baseline survey of 538 schemes (including functionality) in 2011 (Baseline Summary Report 2013). The focus was on RVWRMP schemes which are relatively recent but also DWSS, DDC-VDC and NGO schemes were surveyed. This survey gives a lower functionality picture of especially the older DWSS and DOLIDAR (DDC-VDC) schemes, while NGOs and especially the RVWRMP score better in terms of functionality. It also supports the common view that DOLIDAR schemes in the past have had little efforts on O&M structures like water tariff, O&M fund and VMW. The DWSS and NGO schemes have similar percentages of these structures present and the recent (0-5 years old) RVWRMP schemes the highest percentages.

Table 3-3 Analysis based on the RVWRMP study database

	DWSS	DDC-VDC	RVWRMP	NGO	Total (incl. others)
No.	134	72	238	86	536
%	25%	13%	44%	16%	100%
Age	12	11	2	7	7
Functionality Score*	2.5	2.2	4.0	3.0	3.2
Pipe length (km)	4.1	3.4	4.7	3.4	4.2
No. of hh (no.)	57	33	62	38	53
VMW	51%	18%	86%	35%	60%
Water tariff	31%	7%	48%	13%	32%
Maintenance Fund	33%	19%	83%	42%	55%

* Functionality score is based on recorded tap functionality that is scored from 0=closed down to 5=fully functioning.

To get comparable insights from the present study 11 of the 15 enumerators were interviewed on qualitative statements in the questionnaires based on general observations and qualitative feedback from users, WUSCs, VDCs, agencies, NGOs and DDCs. The enumerators' understanding of the differences between of the implementation agencies and their modalities from the field and discussions with the users, WUSCs, VDCs and DDC was:

- DWSS was generally seen as having less flexible procedures and less participation (with construction implementation through contractor). This was seen as affecting ownership and quality of participation. E.g. quality of the works done by the users as their share of the work was of lower quality than in other schemes but the work quality by contractor was quite good.

- DoLIDAR was seen as not following a system, not having the staff and capacity to support the community or to control quality. The support system was also very informal, often consisting of some money or some materials, without full information whether there was a design and estimate and what was in it. Many WASH projects were more like Do-It-Yourself (DIY) schemes.
- Fund Board was seen to have a good and elaborate implementation system, but it was vulnerable to manipulation and often hijacked by UC leaders and SOs in absence of built-in accountability to a third district level party, e.g. DDC, VDC, people's representatives, or other government agencies. The result was often that the WUSCs were often more focused on money matters and management and inadequately focused delivery of services.
- NGOs were seen to have good systems and intentions, with schemes that still looked the most like schemes as they were meant and built. They however often left too much to weak or insincere SOs, could not manage sufficient quality control and lacked follow-up due to post-project absence.

This understanding is largely coherent with the common feeling in the sector and partly collaborated by the survey data. For example the old DoLIDAR (VDC-DDC) schemes have fewer institutional structures still present than the others.

4. Water Supply

4.1 Processes (Implementation, Pre- & Post-construction)

4.1.1 Interpretation of the Survey Findings

The survey findings on processes, i.e. modality elements, show what is there now and what interviewees can recall, not exactly what the concerned agencies have done. However, the report still uses terms like "modality elements had been followed" because e.g. the presence in 2012 of a maintenance fund or the recollection of a training is the best available indicator of the effort at the time of implementation. If agency A and agency B both trained all the VMWs of each scheme, but only the users of schemes supported agency A remember these trainings, the effort by agency A probably have been more adequate.

4.1.2 Governance and Community Capacity Building

As the the table 4-1 below shows, most of the studied schemes were initiated by the community, some by the local government and only a very small percentage by other actors such as politicians and local NGOs.

Although the vast majority of schemes had a User Committee, only half of them had received any training and also about half had any maintenance fund. One third of the WUSCs had been registered. These modality elements had been followed more in NGO schemes than in others.

Table 4-1 Who initiated the scheme in this village

Initiator	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	
Community	63	82	68	75	71 %
DDC	12	10	2	5	8 %
VDC	13	6	6	10	9 %
Agency	0	0	9	3	2 %
Politician	7	2	6	0	4 %
Local NGOs	0	0	0	5	1 %
Others	5	0	8	2	4 %

Table 4-2 User Committee Capacity

Indicator	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	%
Registration at DWRC	31	12	28	42	27
MoU/Agreement with agencies (VDC, DDC, Agency)	78	86	73	95	82
Water & Sanitation Action Plan formulated	11	12	38	24	19
Pre-construction UC workshop	49	20	53	63	45
VMW training	51	25	60	66	49
Spring protection caretaker training	15	12	20	26	18
Procurement training	6	10	23	11	11
Public auditing conducted	22	33	58	66	41
Post-construction workshop	25	20	38	42	29
VMW Present	43	24	53	45	41
MF (any fund)	63	35	75	61	59

It should be noted that the findings on the elements that are still present like having the VMW and Maintenance Fund are more reliable than those about trainings and processes conducted 5-15 years ago.

4.1.3 Financial Modality Elements

The analysis is based both on these secondary and primary data provided by the different modalities. The schemes considered here are gravity schemes only. It was possible to get proper data of costs for around 90% of all the surveyed schemes.

The calculation of per capita cost in terms of different modalities is difficult. This is because modalities use different norms in calculating the total cost. Some, like NEWAH, include hard, soft and sanitation costs. The DWSS, on the other hand, includes sanitation cost but only for schemes which are more recently implemented. HELVETAS is found to include the total WASH cost inclusive of community contribution to derive the total cost. However, in obtaining their per capita cost they use only the construction cost (material and labor costs). DOLIDAR-modality schemes (DDC-VDC) do not seem to have a sanitation component.

The secondary data was difficult to compare as the data provided by agencies was from different periods and regions. Finally the comparison was done on last 3 years only. The analysis of secondary data provided in the table below shows that NEWAH's per capita cost is the highest followed by the DOLIDAR (RRRSDP). The per capita cost of DWSS has been calculated on the basis of 3933 rural schemes (small towns excluded).

All in all, per capita cost seems very similar across the modalities.

Table 4-3 NRs Cost per Household and Capita

Modality	Field Data		Secondary data	
	No. of Sample Schemes	Per Capita Cost	No. of Schemes	Per Capita Cost
DWSS:			3933	4,282
- including Small Towns	65	4,107		
- excluding Small Towns	61	3,161		
DoLIDAR	44	3,354	200	4,184*
Fund Board	40	3,449	416	3,215
NGOs	34	3,377		
• HELVETAS			38	3,906
• NEWAH			66	5,727

Source: Field Survey, 2012, DWSS, Fund Board, HELVETAS, NEWAH.

* Based on Rural Reconstruction and Rehabilitation Sector Development Project data

The DWSS projects tend to be slightly larger than that of the other modalities and there is slightly more focus on remote areas. This also tends to translate into a higher per capita cost of schemes compared to DOLIDAR and the Fund Board. Still, excluding the small town schemes DWSS comes to even slightly lower level of per capita cost than the other modalities when comparing the data collected from the field.

The secondary data was mainly of more recent origin and thus the per capita cost derived from secondary data is slightly higher than the field data based one. The information derived from secondary sources fall back to only about 3 years. Schemes which have been more recently implemented tend to show a slightly higher per capita cost for all the modalities. The high per capita costs of the new schemes are the result of raising material prices, increased sanitation and software components and especially due to many schemes located in difficult areas. Easier schemes have already been implemented and the remaining ones are located in difficult terrain.

The information obtained from the field includes older schemes. The per capita costs of the different modalities are lower than the similar costs computed from secondary information. The per capita costs of the different modalities do not vary significantly. The costs hover around a little over NRs. 3,000. Neither the primary or secondary data show much variation between the modalities/agencies.

The lower values of per capita costs in the case of field information maybe also because the data include only implementation level scheme costs. Other costs like institutional costs are not included.

It is difficult to judge the actual cost effectiveness of schemes based on per capita cost indicator. Cost effectiveness depends on variety of factors like quality of materials, remoteness of the schemes and the technology used.

Table 4-4 Share of Expenditure Components in Total Project Cost - A Comparison across Modalities

	DWSS		DoLIDAR		RWSSFDB		NGO	
	Contribution (Rs '000)	%	Contribution (Rs '000)	%	Contribution (Rs '000)	%	Contribution (Rs '000)	%
No. of Sample Schemes	65		51		40		38	
Scheme Cost	55 684	100	32 644	100	32 449	100	33 346	100
Community Contribution	13 683	25	9 170	28	11 324	35	6 983	26
Agency Contribution	42 000	75	23 475	72	21 124	65	26 363	74
Scheme Cost	55 683	100	32 644	100	32 449	100	33 346	100
Pre Project Cost	1 520	3	1 097	3	1 022	3	896	3
Construction Cost	44 876	81	28 414	87	25 477	79	26 894	81
Health & Sanitation Cost	6 523	12	2 017	6	2 850	9	4 102	12
Training	907	2	420	1	475	1	826	2
Audit Cost	146	0	439	1	1 467	5	321	1
Others Misc. Cost	1 712	3	257	1	1 158	4	306	1

Table 4-4 is based on the information obtained from the surveyed scheme sites. The information on the cost components of the schemes was not always readily available. In the circumstances, only the data from schemes that provided some details on the cost components was used in order to generate the share of different cost components in total the project cost. Firstly, averages of all the cost components were obtained. Secondly, these averages were then multiplied by the number of sample schemes. The percentage share of each cost component in the total project cost was then derived.

Community participation and contribution has been the norm of all the modalities in implementing rural water supply and sanitation schemes. Generally the share of community in the total project cost has been around 20 percent. The community contribution in the sample schemes ranges from a low of 25 percent (DWSS) to 35 Percent (RWSSFDB).



Toilet in Rupertola W.S.P in Dhamana VDC of Bajhang

The distribution of project cost among the various activities of a project shows that construction cost (cement, pipes, other materials and labor) is above 80 percent except in

the case of RWSSFDB (78%). The highest construction cost has been observed in the case of DoLIDAR (87%).

Health and sanitation seems to be given importance by all modalities. The DWSS and NGOs spent more than the other modalities on hygiene and sanitation. It must be noted that the sanitation efforts of all the agencies have become more intensive in the recent years. Training costs were roughly equal but the RWSSFDB used more for auditing compared to other implementing agencies.

The community contribution is higher than the norm of 20 percent, indicating demand for the project in the sample scheme areas.

4.1.4 Technical modality elements

The survey provided insight in a number of technical process elements.

Table 4-5 Technical and Size Aspects

Modality Elements	DWSS	DoLIDAR	RWSSFDB	NGO	Average
	%	%	%	%	%
New	69	71	54	76	67
Rehab	31	29	46	24	33
All schemes	100	100	100	100	100
No. of hh below 25 (design)	28	51	33	14	32
No. of hh 25-75 (design)	48	39	31	58	44
No. of hh above 75 (design)	25	10	36	28	25
All schemes	100	100	100	100	100

Table 4-6 Construction Process Elements

	DWSS	DoLIDAR	RWSSFDB	NGO	Average
	%	%	%	%	%
Procurement Plan Prepared	17	29	45	21	28
Material Procurement training done	6	10	23	11	13
Procurement non-local materials by UC	34	25	60	45	41
Payment procurement by UC	15	8	38	11	18
Good Quality Construction Materials	45	55	58	61	55
Good Quality Service Provider Staff	20	31	23	45	30

Table 4-7 Post Construction Phase modality elements

Modality Elements	DWSS	DoLIDAR	RWSSFDB	NGO	Average
	%	%	%	%	%
a. Registration at DWRC Database	31	12	28	42	27
b. Upfront O&M Fund collection	95	96	93	95	95
c. VMW Present	43	24	53	45	41
d. VMW Trained	51	25	60	66	51
e. Sufficient Tools present	9	10	15	21	14
g. MF (any fund)	63	35	75	61	59

Both tables show that on average sustained results of efforts in people’s participation, user capacity building and strengthening O&M can be found a bit more in NGO-supported schemes. On average these processes were followed in relative low percentage of studied schemes but some of these processes and efforts have become more institutionalized parts of implementation by all agencies in the recent years. Presence of most of the post-construction phase elements can still be verified on the ground so the findings related to these can be taken with more confidence.



Maintenance tools and spare parts in Jhaulekh W.S.P in Siddeshwor VDC of Baitadi

Table 4-8 Material Quality and Procurement Modality

Procurement Modality	Good	Satisfactory	Not Satisfactory	Overall
	%	%	%	No
LBFAR procurement	43	49	8	108
WUSC procurement	67	28	5	76
Total:	53	40	7	184
Payment for materials by:				
WUSC	46	49	6	35
DDC	48	39	13	46
VDC	71	29	0	17
WSSDO	32	64	4	28
Others	77	20	3	30
Total:	53	41	6	156

Table 4-8 shows that involving the users in procurement is linked to slightly higher perceived quality of materials. It must be noted here that the actual quality is not known and this is based on the people’s recollection of the quality of materials.

4.1.5 Social & Community Institutional Modality Elements

Like with overall modality elements, gender-related results are higher in NGO-supported schemes. Findings on support to vulnerable groups did not show clear differences among modalities.

Most commonly practiced mechanisms for community participation, ownership, capacity building and gender and social inclusion seem to be involving women in deciding the tap locations and involving female tap stand caretakers. It is much less common to have female chairperson of the WUSC or to have women in the more technical position of VMW. These practices have become more common in recent years but yet not visible in the sample. In terms of support to marginalized groups provision of paid work and exemption from cash contribution were the only relative common mechanisms practiced in the studied schemes.

Table 4-9 Women’s participation

Indicator	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	%
% schemes in which women were involved in deciding Tap Stand	68	73	75	84	74 %
% schemes where women were present during public audit	9	12	38	32	20 %
% schemes where women are chairperson	0	2	0	11	3 %
% schemes with female VMW	2	2	0	0	1 %
% schemes with female tap stand care takers	31	39	50	53	41 %

Table 4-10 Support to marginalized households

Type of Support	Overall	DWSS	DoLIDAR	RWSSFDB	NGO
	%	%	%	%	%
Provision of paid work	15	12	18	10	21
Payment exemption for maintenance fund	3	5	0	5	3
Payment to maintenance fund in easy installments	2	0	4	3	3
Work (kind) contribution only	30	32	29	33	26
Application of the GoN policy for poor and excluded (exemption of 1% upfront cash and only 10 % contribution in labor work)	7	8	8	8	3
Other	8	11	8	8	5



Preparing a social map with the users in in Payupata W.S.P in Payupata VDC of Baglung

4.2 User Feedback on Modalities

The questionnaires covered also the user’s views and suggestions for improvement in scheme implementation based on their experience. The main/recurring comments by modality are shown in the below table.

Table 4-11 Most commonly recurring suggestions

Modality	Sample	More awareness building/ training should be provided		More attention should be paid for quality survey, work, materials and technicians		Involve users more in selection of intake and tap locations		Investment and project details should be known by the users	
DWSS	40	15	38%	4	10%	3	8%	5	13%
DoLIDAR	57	21	37%	9	16%	8	14%	5	9%
RWSSFDB	32	16	50%	6	19%	5	16%	4	13%
NGOs	29	7	24%	11	38%	6	21%	2	7%
Total	158	59	37%	30	19%	22	14%	16	10%

The table has been compiled from a multitude of answers, showing only the most frequently mentioned suggestions. UCs of 158 schemes had given at least some answer. The samples and result differences are too small to draw conclusions on differences between modalities. It seems that the people are often demanding for more of the kind of support that the organisations are already giving them due to more awareness on these issues. E.g. NGOs provide more technical support to schemes than DDC-VDC, but more NGO-schemes suggest higher levels of technical support.

4.3 Institutional Functionality

The following table provides insight in the present community-level institutional functionality (WUSC, VMW). Inter-modality differences appear to be smaller than for modality elements like capacity building and gender, although the DDC-VDC schemes consistently score lower than the others.

Table 4-12 Institutional Functionality

Functionality Indicator	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	%
1) WUSC Reformation year after 2007	31	14	28	37	27
2) Any Meetings held last year	31	22	38	42	32
3) WUSC Decisions are Implemented	31	25	50	55	38
4) O&M Fund has been spent during last 12 months	12	8	25	11	13
5) VMW monitors scheme at least annually	45	25	35	39	37

Only about one third of the studied schemes still have some institutional structures such as active WUSC or VMW present. Generally the NGO- and RWSSFDB schemes have a bit more of these institutional structures intact and the DoLIDAR (DDC-VDC) least. Below in chapter 4.4 we analyse the correlation of presense of these structures and the scheme functionality as well as service level.

4.4 Technical Functionality

4.4.1 Functionality

Functionality is viewed differently by different stakeholders, who each focus on different aspects: e.g. design, functioning of taps, water availability in the village, water quality, use, sanitation and hygiene effects, resource mobilization, or water for one particular group.

Engineering departments might emphasize the design and the need to repair schemes to their original design and standards. NGOs might emphasize the participation and the communities' capacity to manage and maintain the schemes. DDCs with DoLIDAR might emphasize the role of VDCs and DDCs and political feasibility. Users might just want water closer-by or cleaner than before. These views may also be in contradiction. Users might enjoy a tap-less and reservoir-less system of pipes and "illegal" connections while an agency engineer would evaluate it as needing major repairs or rehabilitation. Or users might enjoy a system that is run nearly single-handedly by an old authoritarian leader who has always dominated the village without ever needing a user committee or ever listening to women and minorities. Users might be always on the lookout for money and support whatever and grab whatever they can without caring much for the conditions, processes, the technical advice from a technical staff who only visits the site once or twice, or for participatory processes dominated by paternalising outsiders.

4.4.2 Functionality Indicators

The study mainly uses two functionality indicators, the simple percentage of taps still working as a measure of technical functionality, and the more complex comprehensive service level (QARQ⁴-functionality) indicator that integrates quality, quantity, accessibility and reliability. The former is what villagers and visiting officials often look at as it is simple to establish, while the latter requires more extensive checks and even measurements. As a cross-check and an indicator of how complex functionality actually is, it is also assessed in a quick-and-dirty way how many people actually drink water that is brought by the scheme from the source. This includes tap use and pipe use. This is provided in the Scheme Use Functionality Indicator.

Tap Functionality

Tap functionality is the number of working taps divided by the number of taps originally installed

Scheme Use Functionality

The percentage of intended users that makes any use of the scheme for water supply in whatever way, be it through taps, pipes, cuts, reservoirs, and leaks

Service level functionality (QARQ)

An overview and comparison of actual service levels at customer level: water quantity, access, reliability and quality of water (QARQ)

⁴ Quality, Accessibility, Reliability and Quantity

4.4.3 Tap Functionality Results

The survey collected a high quantity of data on technical aspects, out of which one was considered the most relevant and manageable indicator for technical functionality: the percentage of taps that are still working. This also represents full range of possible technical issues that may be due to functionality problems anyway from the intake to the tap. On top of this analysis we did the service level (QARQ) analysis that delves deeper into issues affecting the actual service level provided by the schemes to the people.

The survey found that in the average scheme around three thirds (74%) of the taps are still working.

- No statistically significant difference was found between different modalities. It seems their weaknesses and strengths, some of which are listed under chapter 2 above, have cancelled each other out.
- No statistically significant difference was found between regions, hills and mountains, various caste-ethnicity compositions, and levels of remoteness
- More differences, sometimes statistically significant, were found for Terai, the smallest and biggest community schemes, the poorest schemes and schemes that are not registered and do not have a maintenance fund
- Also age matters: functionality is 10% less in 10 year-old sites
- There is further a correlation between functionality and the existence of maintenance funds and the registration at district level.

a. Tap Functionality Results by Non-Modality Factors

Tap functionality was assessed for few non-modality factors. Functionality appeared to be higher for newer schemes, regions East of Dhaulagiri, mountain districts, less poor and less remote areas but differences are minimal or statistically insignificant.



Leaking pipe in Chhatyungaira W.S.P.in Ghyalchock VDC of Gorkha

Table 4-13 Tap Functionality and Non-Modality Factors

Modality or modality element	Sample	% Tap working
FW & MW	80	72%
West & Central & East	110	76%
Older schemes 1996-2002	120	71%
Newer schemes 2003-2007	62	79%
Mountain	69	79%
Hill	94	72%
Terai	27	69%
Poor	56	68%

Less Poor	99	77%
Remote	46	72%
Less remote	109	74%
Total	192	74%

The above table shows that non-modality factors like region, geography, age and poverty have some correlation with functionality. The schemes in less poor and remote areas are working better and the newer schemes have better tap functionality than old ones.

b. Modality Elements & Tap Functionality

Functionality should be linked to the process followed in implementation and post implementation. It cannot be reconstructed whether any lackings occurred in the plan, the design or the implementation and whether weaknesses in implementation can be traced to the donor, the agency, local leaders or the local NGO or the users themselves.



A cut pipe tap stand and properly functional tap stand in Dhije Mul W.SP. in Shikarpur VDC of Sindhupalchowk district

This analysis looked at existence of UC training, maintenance fund and registration. No significant correlation was found between tap functionality and the existence of user committees or the training thereof. There was however a visible correlation with registration and the existence of maintenance funds. It is not possible to say whether the maintenance funds and registration were a result from a well working user committee with a well-functioning scheme or whether the maintenance fund and registration efforts actually have helped create a well-functioning user committee that does good O&M.

Correlation was assessed between tap functionality and few modality element indicators. No significant correlation was found between tap functionality and whether user committees had received any training. However UC registration and existence of a maintenance fund seemed to improve tap functionality by 10-15%. Differences between the four agency modalities appeared to be statistically insignificant.

Table 4-14 Functionality and Modality Elements

Modality or modality element	Sample	% Tap working
UC receiving any training	102	74%
UC Not Trained	88	73%
Maintenance fund	85	82%

Non-Maintenance fund	107	67%
UC Registered	69	82%
UC Not Registered	121	69%
DWSS schemes	65	73%
Dolidar schemes	51	76%
FB schemes	38	72%
NGO schemes	38	75%
Overall	192	74%

4.4.4 Tap Functionality Conclusions

Modality and non-modality factors appear to influence functionality in roughly equal ways, but specific determinant factors cannot be singled out. Sincerely implementing elaborate guidelines increases the chance of sustained scheme success, but the fact that low-effort DDC-VDC schemes do not perform significantly worse than the others suggests that other factors are just as important. It is probable that the effect of some DDC-VDC modality factors has been underestimated. These have not been systematically studied under this survey, but discussion with stakeholders provided few obvious suggestions:

- DDC-VDC Beneficiaries often only get some money or some pipes (DIY-schemes) and have to do everything alone. This results in
 - Increased feeling of ownership
 - Early effort in community and resource mobilization
 - A good school for post-construction O&M, likely better than intensive agency guidance and supervision.
- The link to VDCs and DDCs developed during the DDC-VDC scheme implementation might be worth a lot for sustained O&M.



Non-functional tap stand in Katthur W.S.P. in Maohanyal VDC of Kailali

4.4.5 The Scheme Use Indicator

To get a more complete picture, the consultants did a check with enumerators and their data on how many households actually use any water (tap, pipe, cuts, reservoir) that is brought by the scheme to the community. It shows that an estimated 62% of intended users drink water from the designated taps, while another 22% users cannot use their own taps but still use scheme water from pipes, cuts and reservoirs or from taps lower down or higher up in the village. 85% of the intended users actually make use of the scheme, while an estimated 15% of users drink water from non-scheme sources, i.e. local kuwas, springs and other schemes. These figures differ from the tap functionality percentage (73%). but also show an important aspect of functionality.

The differences might not all be statistically significant, but certainly need further study and discussion. Differences for various non-modality and modality factors were notably small. The most noticeable finding was that NGO schemes functioned most as per design (people drink from own taps), but that so many DDC-VDC scheme beneficiaries use the scheme in informal ways that the overall number of beneficiaries seems highest among all four modalities.

Table 4-15 How Many Households Actually Use the Scheme?

Category	Scheme sample	% hh that drink water from own taps	% hh that drink any other water (pipe, tank, others' taps)	Total drinking from scheme %	Remarks
a	b	C	D	e=d+c	
DWSS		62%	21%	83%	
DOLIDAR		57%	34%	91%	Most use outside design
FB		57%	22%	79%	
NGO		71%	9%	80%	Most according to design
Total	156	62%	22%	83%	

4.4.6 Service Level (QARQ) Functionality

The analysis of service level covers 5 aspects of water supply service – **Q**uantity of water, **A**ccessibility in terms of distance, year round **R**eliability, **C**ontinuity (hours per day) and **Q**uality of Water. The data was collected from all schemes through the scheme level as well as customer questionnaire (5 customers of each scheme). For this analysis the average answer of the customers per scheme was taken.

Table 4-16 QARQ Definition

Category	Quality	Quantity (l/c/day)	Accessibility (min)	Reliability (mon/year)	Continuity (hr/day)
Service Level 1 - Good	Good WQ*	over45	<15	12	>6
Survey categories	Good WQ*	Adequate	<15	12	Always
Service Level 2 – Acceptable	Acceptable WQ*	25-45	15-30	11-12	5-6
Survey categories	Moderate WQ*	Moderate	20	11	6
Service Level 3 - Poor	Poor WQ*	15-25	30-60	10-11	4-5
Survey categories	Poor WQ*	Seasonal	30	10	3
Service Level 4 - Very Poor	All other water supplies				
Survey categories	None	None	>30	<10	0
Poorest characteristic decides the service level					

*Water Quality Index in Annex 3

The service level data was analysed separately for each of the components of QARQ as well as correlating the overall service level of a scheme to several key modality and non-modality factors. This analysis helps to define which aspects and factors lead to sustainably better service level.

Table 4-17 Quantity

Quantity of water	Responses	Good (45lcd<)	Moderate (25-45)	Poor (15-25)	Very poor (<15lcd)
		%	%	%	%
Total sample	194	72	20	6	2

Mountain	50	84	12	2	0
Hill	118	66	23	8	3
Terai	26	73	19	4	0
ECWR	99	74	18	4	2
MFWR	95	69	21	8	1
Age of scheme (completed)					
1996-2001	67	66	22	7	3
2002-2007	72	72	21	7	0
Modalities					
DWSS	65	65	22	9	5
DoLIDAR	51	69	22	8	0
RWSSFDB	40	78	18	3	0
NGOs	38	82	16	3	0

There seems to be only small variations of quantity of water by geography and regions. Also the age of the schemes seems to have a small effect on the amount of water available. Of the modalities RWSSFDB and NGOs come out a bit better here but overall all the modalities well with around 90 to 95% of all schemes is the 2 higher categories.

Table 4-18 Accessibility

Accessibility	Resp.	Good (<15 min)	Moderate(<30min)	Poor (30min<)
		%	%	%
Total sample	194	64	31	5
Mountain	50	66	30	4
Hill	118	64	33	3
Terai	26	62	27	12
ECWR	99	75	21	4
MFWR	95	53	42	5
Age of scheme				
1996-2001	67	58	34	7
2002-2007	72	76	24	0
Modalities				
DWSS	65	58	34	8
DoLIDAR	51	63	35	2
RWSSFDB	40	65	30	5
NGOs	38	74	24	3

Accessibility is surprisingly similar across the eco-regions but there is significant difference between the Mid- and Far-West (MFWR) and the other development regions MFWR having poorer accessibility on average. Also the older schemes tend to have poorer accessibility. Here the modalities come out in very similar way with only the NGOs faring a bit better.

Table 4-19 Reliability (annual)

Reliability	Responses	Good (year round)	Moderate (11 months<)	Poor (10 months<)	Very poor (<10 months)
		%	%	%	%
Total sample	181	90	2	5	3
Mountain	47	85	2	9	4
Hill	111	92	1	5	3
Terai	23	91	4	0	4
ECWR	92	97	1	1	1
MFWR	89	83	2	9	6
Age of scheme					
1996-2001	60	88	2	8	2
2002-2007	68	88	1	4	6
Modalities					
DWSS	59	88	0	8	3
DoLIDAR	47	91	4	2	2
RWSSFDB	38	95	3	0	3
NGOs	37	86	0	8	5

Reliability is better in Easter, Central and Western (ECWR) than in the MFWR. Surprisingly there is very little difference here between older and newer schemes and also the different agencies/modalities have similar results with around 90-95% of schemes in the 2 highest categories.

Table 4-20 Continuity (daily reliability)

Continuity	Responses	Good (all day)	Moderate (<6 h/day)	Poor (<3 h/day)	Very poor (intermittend/ no service)
		%	%	%	%
Total sample	185	84	6	8	2
Mountain	49	90	6	4	0
Hill	113	82	5	10	3
Terai	23	78	13	4	4
ECWR	95	85	5	7	2
MFWR	90	82	8	8	2
Age of scheme	0				
1996-2001	63	92	3	2	3
2002-2007	69	77	9	14	0
Modalities	0				
DWSS	62	76	10	8	6

DoLIDAR	47	87	6	6	0
RWSSFDB	39	87	5	8	0
NGOs	37	89	3	8	0

In the continuity or daily reliability of water supply there is again not a great difference between the eco-regions. MFWR is doing bit worse than the other regions. Surprisingly it seems that the older schemes are actually faring better in terms of continuity maybe because there have been more reliable sources available when they were built.

The different agencies have also a similar result with 85 to 90 % in 2 highest service categories. DWSS schemes are a bit less concentrated in the highest category and also a few schemes in the very poor service category.



Testing water quality at the intake of Nakedanda W.S.P in Jaid VDC and tap stand of Mulachharne W.S.P in Hatiya VDC of Baglung

Table 4-21 Quality

Quality	Responses	Good (80-100)	Moderate (51-80)	Poor (<50)
		%	%	%
Total sample	193	76	14	10
Mountain	50	64	20	16
Hill	117	82	10	8
Terai	26	69	19	12
ECWR	99	79	13	8
MFWR	94	72	15	13
Age of scheme				
1996-2001	67	75	15	10
2002-2007	71	83	11	6
Modalities				
DWSS	65	80	8	12

DoLIDAR	50	76	20	4
RWSSFDB	40	63	20	18
NGOs	38	82	11	8

Water quality of the schemes was tested and the quality was classified in three categories according to a water quality index (Annex 3).

In terms of water quality the schemes in the hills have the best service level followed by the mountain schemes. Terai schemes have in general a bit lower water quality. There is not a considerable difference between the development regions or the ages of the schemes. The agencies also come out with similar results with only the RWSSFDB schemes coming out more in the moderate rather than good WQ category.

Table 4-22 QARQ by modalities

QARQ (Rural)	Responses	1 - Good	2 - Moderate	3 - Poor	4 - Very poor
		%	%	%	%
DWSS	65	32	31	25	12
DoLIDAR	51	29	53	14	4
RWSSFDB	40	35	38	20	8
NGOs	38	47	21	24	8
Total sample	194	35	36	21	8



A broken tap stand with water still supplied by a loose pipe in Khulikhola W.S.P. in Burtibang VDC of Baglung district

There seem to be only small differences between the modalities.

DWSS has higher than average percentage of schemes with Good service level but also relatively high in Poor and Very Poor service level categories. This is largely explained by higher number of schemes scoring low in quantity and continuity.

The NGOs schemes show very similar overall picture to the DWSS but a larger number of them scored relatively low on annual reliability.

DoLIDAR (DDC-VDC) scores a bit lower in the Good category but has least schemes

in the 2 lowest categories. Their schemes are concentrated in the Moderate category.

RWSSFDB schemes have lowest percentage in Good service level category, but most of their schemes are in the second (Moderate category). This is largely due to more schemes falling in to the moderate water quality category.

Overall about one third of the schemes have good service level, another third moderate, around 20% Poor and 10% Very Poor.

Table 4-23 Overall QARQ Analysis

QARQ (Rural)	Responses	1 – Good	2 - Moderate	3 – Poor	4 - Very poor
		%	%	%	%
Total sample	194	35	36	21	8
Mountain	50	38	30	24	8
Hill	118	36	36	21	7
Terai	26	27	46	12	15
ECWR	99	41	35	17	6
MFWR	95	28	37	24	11
Age of scheme	0				
1996-2001	67	31	40	19	9
2002-2007	72	42	29	24	6

Comparing the overall service level (QARQ) of the schemes to several modality and non-modality factors can shed more light to the aspects that should be considered for future modalities that the comparison between the modalities that have already changed a lot from the ones used while implementing the studied schemes.

In this analysis the Terai has lower percentage of schemes in the best category due to the moderate water quality results and the MFWR scores a bit lower than the other development regions. The newer schemes score a bit better but the difference is not very significant.



Generator for pumping at Urlabari W.S.P in Urlabari VDC in Morang and reservoir tank in Bardibas W.S.P in Bardibas VDC of Mahottari

Table 4-24 QARQ compared to scheme size

QARQ (Rural)	Responses	1 - Good	2 - Moderate	3 - Poor	4 - Very poor
		%	%	%	%
9-22HH	45	42	24	27	7
23-40HH	61	38	31	23	8
41-78HH	42	29	48	14	10
79-250HH	27	37	44	11	7
Total	175	37	35	20	8

Scheme size doesn't seem to have a clear correlation to the service level. Bigger schemes (over 79HH) fare a bit better and moderate sized schemes (41-78HH) are mostly concentrated in the moderate category.

Table 4-25 QARQ compared to key process factors

QARQ Compared to key process factors		1 - Good	2 - Moderate	3 - Poor	4 - Very poor
	Responses	%	%	%	%
Pre-construction phase					
Initiated by community	146	36	33	24	8
WUSC registered	47	45	32	17	6
Community Action Plan followed	37	49	27	19	5
Women involved in deciding taps location	141	33	34	23	10
Up-front O&M fund	92	36	35	20	10
Construction phase					
Procurement committee visited market at least once	44	43	27	18	11
Material procurement training conducted	22	50	32	9	9
Account training conducted	26	65	19	4	12
Payment for materials by WUSC	33	52	30	9	9
Payment by VDC/DDC	62	31	47	19	3
Payment by DWSS	27	30	37	11	22
LBFAR procurement	104	33	38	19	11
WUSC procurement	76	39	33	22	5
Good Quality of construction materials	103	41	39	17	4
Satisfactory Quality of construction materials	76	33	32	21	14
Poor Quality of construction materials	13	8	31	54	8
Good Quality of service provider	55	5	15	38	42
Satisfactory Quality of service provider	88	10	20	32	38
Poor Quality of service provider	27	11	33	33	22
Good Quality of workmanship	70	34	37	20	9
Satisfactory Quality of workmanship	96	41	32	22	5
Poor Quality of workmanship	25	20	40	20	20

Post-Construction phase					
Public auditing	79	41	30	22	8
WUSC remains active (at least 2 meetings)	44	45	32	18	5
Water tariff collected	58	36	29	24	10
WMW paid	61	38	34	16	11
WMW active (visits at least 2/y)	67	36	36	21	7
Tap stand caretaker monitoring taps at least monthly	130	35	37	22	7
Total sample	194	35	36	21	8

Some modality elements where only a very small number of responses was given have been left out of this analysis.

The payment for materials by the WUSC seems to lead to sustained good service level a little bit more than the other modalities of payment. This is probably linked to the related feeling of ownership. In schemes where WUSC is actively involved in procurement there is also likely to be more focus on their capacity building. Also the registration of WUSC and following processes such as community action planning

as well as sustained activity of WUSC seem to correlate with slightly higher service levels.

Quality of materials has a clear correlation with better service level but the correlation with better service provider and workmanship is not as pronounced. This may be partly due to people having difficulty in rating the service provider and workmanship years after the scheme has been built.

Of the post construction elements the active WUSC seems to have most clear correlation to above average service levels.



Collection chamber working with makeshift repairs in Thachambu W.S.P. in Thachambu VDC of Taplejung

4.4.7 Service Level (QARQ) Overview and Conclusions

Table 4-26 QARQ Overview

Category	% schemes with Good Quantity score	% schemes with Good Access score	% schemes with Good Reliability score	% schemes with Good Quality score	% schemes with Good QARQ score
DWSS	65	58	88	80	32
Dolidar	69	63	91	76	29
RWSSFDB	78	65	95	63	35
NGO	82	74	86	82	47
FW & MW	69	53	83	72	28
W&C&E	74	75	97	79	41
1996-2001	66	58	88	75	31

2002-2007	72	76	88	83	42
Mountain	84	66	85	64	38
Hill	66	64	92	82	36
Terai	73	62	91	69	27

Overall the service level of the studied schemes was even surprisingly good – about two thirds of the studied schemes had good or acceptable service level. Less than 10% of the studied schemes had very poor service level and there were only two schemes totally out of service. There were relatively small differences between the ecological zones – only notable difference being the relatively lower quantity and higher quality of water in the Hills. There was more clear difference between the Far- and Mid-West and the other regions with FMWR having generally lower service level this was also clearly the case with older schemes.

Urban and large scale schemes

Above analysis includes the 194 rural schemes surveyed. There were 7 larger scale schemes that were excluded of the analysis as these have a more professional management structure and more sophisticated technologies involved. Out of these schemes Urlabari and Belbari are overhead tank schemes, Okhaldunga and Hapur are in rural towns but are large and with a large number of private taps and the rest are small town schemes. The large schemes, with the exception of Okhaldunga, are located in the Terai area.

The analysis shows that these schemes mainly have good functionality in all other aspects except continuity (daily hours of service). The issues with continuity are probably to do with designed schedules of water provision rather than problems with functionality and don't necessarily mean poor service level.

Table 4-27 QARQ in larger small town and pumping schemes

District	Scheme Name	AGE	Region	Quality	Qty	Access.	Reliab.	Continuity	Service Level	Modality	HH
Okhaldunga	Okhaldunga	2002-2007	ECWR	Good	Good	Good	Good	Good	Good	DWSS	550
Dang	Hapur Kha.Pa.Aa Skim-2	1996-2001	MFWR	Good	Good	Moderate	Good	Moderate	Moderate	DWSS	800
Kailali	Bargada	1996-2001	MFWR	Good	Good	Good	Good	Very poor	Very poor	DWSS	3615
Mahottari	Bardibas	1996-2001	ECWR	Good	Good	Good	Good	Very poor	Very poor	DWSS	2599
Morang	Urlabarri WSP	1996-2001	ECWR	Good	Good	Good	Good	Good	Good	DWSS	1855
Morang	Belbari STWSP	2002-2007	ECWR	Good	Good	Good	Good	Moderate	Moderate	DWSS	702
Morang	Jalakanya WSP	1996-2001	ECWR	Good	Good	Good	Good	Moderate	Moderate	RWSS FDB	361

4.4.8 Functionality comparison with NMIP

The survey found that of the surveyed schemes in the age group of 5-15 years, 74% are still in functional condition (tap functionality) and 71% provide at least moderate service, which is comparable to NMIP data which show that 65% of schemes in the same age group is in good condition or only needing minor repairs. Among the surveyed schemes about 60% were well managed or only needed minor repair according to NMIP data. Users suggested that Fund Board and NGO supported schemes tend to function a bit better but there is not much difference in survey findings. For all modalities around 74% of schemes were found to be in reasonable condition compared to NMIP finding clearer difference with NGO and Fund Board (74%) and GoN agency schemes(61-66%). This analysis shows that overall the survey results indicate a slightly better functionality than the NMIP data and that especially the surveyed government schemes fared a bit better in terms of functionality than NMIP average.

Service level functionality provides a largely similar picture. 32% of DWSS, 29% of DoLIDAR (combined GoN 31%), 35% of RWSSFDB and 47% of NGO (combined 40%) supported schemes surveyed still provided good service level. There is a 9-10% difference between GoN and NGO-RWSSFDB compared to 10-15% in the NMIP. The average service level ("QARQ factor") is 2 for NGOs and Fund Board and 2.1 for the GoN agencies (meaning that on average the surveyed schemes provide moderate service). Annex 1 provides a scheme-by-scheme comparison of the NMIP functionality status and the surveyed service level of the schemes. The overall trend is largely similar but there are a number of clear differences mainly towards a better status in the survey than in the NMIP database. A large proportion of the surveyed schemes which NMIP scores at the lowest levels of functionality (needing full reconstruction or rehabilitation) scored relatively well in our service level (QARQ) analysis. This can be caused by problems in either NMIP or present survey database or the different methodologies of defining functionality and service level – schemes that would benefit from technical repairs can still be providing adequate service at the present moment.

4.4.9 Reasons for low service level and functionality

The survey included some information on reasons for system functionality problems presented in the table below. There is not much difference between the reasons in terms of better or worse condition of the scheme but we can see that the most responses have been given on institutional aspects as the reasons for low functionality. Low managerial and technical skills at scheme and WUSC level come out as the most recurrent reply followed by absence of VMW/operator. The lack of proper support services is also among the commonly cited reasons for functionality problems.

Table 4-28 Reasons for low service level and functionality

Reasons for Functionality Problems	Total Resp.	In Good Condition	Need Rehabilitation	Unusable Scheme
		%	%	%
Low Technical Skills at Scheme Level	111	22	75	4
Absence of VMW or Operator	94	20	78	2
Inadequate Managerial Skills of WUSC	116	16	81	3
Lack of Support Services	93	16	83	1
Poor Design/Construction Quality	46	15	83	2
Increased Number of Public Taps or Illegal Private Connections	9	11	89	0

Depletion of water source	21	29	71	0
Natural Calamities	34	21	74	6
Others	28	18	82	0
Total:	552	19	79	2

Among the reasons for low service level and functionality the modality and non-modality factors both play a role:

- **Non-modality factors** had a significant impact on the service level and functionality of schemes. There were relatively small differences between the ecological zones – only notable difference being the relatively lower quantity and higher quality of water in the Hills. There was more clear difference between the Far- and Mid-West and the other regions with FMWR having generally lower service level this was also clearly the case with older schemes.
- **The studied agencies/modalities** also fared roughly equally in terms of service level.
 - Technical issues come out as among the factors for better or worse sustained service level of the schemes. Especially the Quality of the used construction materials is strongly linked to sustained service.
 - The institutional aspects of Operation and Maintenance also play a strong role. Processes that create better ownership such as involvement in procurement of materials, registration and community action planning are linked to improved service level. Linked to this is the continued presence of active institutions such as WUSC and VMWs etc is among the key factors. These are also the issues most commonly given as the reason for problems by the scheme users. Also the lack of proper support mechanism for repairs and rehabilitation is among the issues raised as a reason for failure and this should be looked at as one of the key factors causing low levels of functionality.
- **Environmental issues** such as source depletion or large scale disruptions by landslides etc. were not studied in great detail. Below table shows that about 60% of the water sources of the studied schemes had yields as per design, around 40% had reduced yield and a few sources had totally dried up.



Intake of the Dhungra Khola W.S.P. in Shikharpur VDC of Makwanpur



Pipeline disrupted by a landslide in Bajhadi W.S.P. in Hugsidir VDC of Baglung

Table 4-29 Water source situation

	As per Design %	Source Reduced %	Source Dried Up %	Sample (Sources)
DWSS	55	44	1	80
DoLIDAR	69	29	1	68
RWSSFDB	53	43	4	53
NGO	55	38	7	60
Eastern	46	50	4	26
Central	48	46	6	52
Western	63	35	1	71
Mid Western	46	52	2	46
Far Western	74	23	3	66
Total:	58	39	3	261
Age	As per Design %	Source Reduced %	Source Dried Up %	Sample (Sources)
2002 – 2007	55	42	3	99
1996 – 2001	61	38	1	87
Total	58	40	2	186

About 50% of the schemes have multiple sources. Age data missing for some schemes

The fact that over 40% of the sources in the studied schemes have noticeably reduced yield indicates that there should be more attention paid to the source selection (proper measurement of dry season yield etc.) and source protection (including forest protection and if necessary plantation around the source) to ensure that there is enough water from the source at least for the design period. There might be also a need to identify complementary or alternative water sources (e.g. alternative springs, rain water harvesting, lifting) or to plan for water rationing/ intermittennd supply during the dry season when reduced yield can lead to water shortages.

4.5 Equity and GESI issues

The government’s PRSP as well as the policies for most of the projects under which the schemes have been implemented, stress poverty alleviation and equity as aims, recognizing exclusion of specific groups as an issue in achieving MDGs. Unequal Citizens (WB-DFID 2009) and other Worldbank studies highlight skewed benefit distribution patterns for WASH and other development projects.

Equity at outcome level cannot be properly measured on basis of the survey results as it was neither possible to reconstruct the pre-project needs for various groups nor to establish whether those needs have been addressed. The survey also could not give sufficient



Social mapping in the Seseni W.S.P. in Dhumkibas VDC of Nawalparasi

insight in the levels of scheme-level poverty, remoteness, caste-ethnicity composition and other potential disadvantages. Nationally available data are not useful as the variation within each Ilaka or VDC is too great to make any estimate of poverty or disadvantage at scheme level. The issues of women’s and marginalized groups’ participation have been analysed to the extent possible above in chapter 4.1.5. From that analysis it is seen that relatively low percentage of the schemes studied had specific provision for involving or providing support to women and marginalized groups beyond involving women in deciding the tap stand locations and excluding some poor household from cash contribution. The RWSSFDB and NGO-schemes had slightly more of such practices and efforts.

One source that suggests that women’s participation makes a difference is the the NMIP database asit provides data on participation of women in WUSCs. When comparing women’s WUSC membership is plotted against scheme functionality scores (e.g. score 5 is in “well-managed”, score 4 is “needing minor repairs” and score 3 is “needing major repairs”), the findings suggest that non-inclusion of women results in lower functionality and that the optimum level of women’s inclusion in WUSCs lies around 40-50%. See the table below and further analysis of NMIP data in Annex 4.

Table 4-30 % of women in WUSC compared to functionality (NMIP)

% women in WUSC	No. schemes	Functionality Score
0%	2284	3.3
1-10%	409	3.4
11-20%	3856	3.5
21-30%	5015	3.5
31-40%	1585	3.7
41-50%	698	3.6
51-	400	3.5

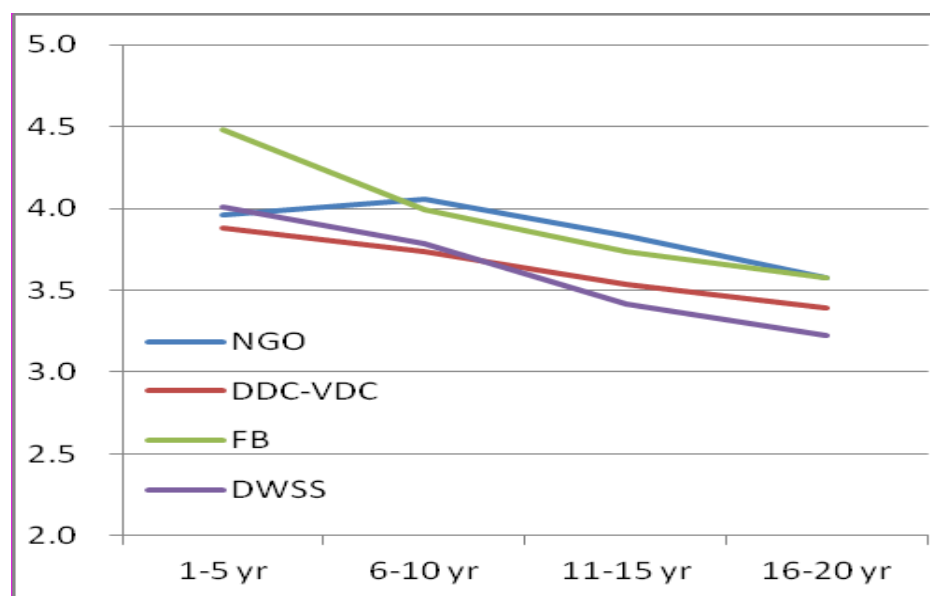
Source: NMIP (MoUD). Functionality score is based on conversion of scheme condition categories to scores (e.g. 5 for well-managed, 1 for needs reconstruction)

4.6 Sustainability

Sustainability of access to safe, sufficient, reliable and close-by water is directly related to the sustainability of scheme functionality and service level, which have been dealt with under heading 4.4.3 and 4.4.5.

The following figure is based on NMIP data, plotting functionality scores against age, based on conversion of NMIP’s scheme condition categories to scores (well-managed is 5, needing rehabilitation is 1). It shows how the average scheme deteriorates from new to on average ‘needing minor repairs’ (score 4) after 5 years and to on average ‘needing major repairs’ (score 3) after 15-20 years.

Figure 3 How Schemes Age (NMIP data)



The figure shows that even though there are some more clear differences in functionality among the agencies for the first 5 years the functionality comes down to similar levels after around 5-10 years from completion.

The presence of certain structures, institutions and practices related to schemes' sustainability was analysed in comparison to the service level provided by these schemes. In general it can be seen that that mostly the newer schemes are more likely to have these sustainability elements in place. Having such institutional structures and practices in place also generally leads to higher than average service level provided by the schemes. It seems that having a proper O&M fund, tariff collection and the presence of village maintenance worker as well as sufficient spare parts and tools lead to considerably higher than average service levels.

Table 4-31 Sustainability elements compared to age of schemes and service level (QARQ)

	Resp	Old schemes	New schemes	Overall	% of schemes (QARQ score)			
		2001	2002-		Good	Moderate	Poor	Very poor
Three or more WUSC meetings held in last 12 months	28	12	20	14	43	27	23	7
WUSC meeting decisions implemented	57	23	40	29	41	41	15	3
WUSC has been renewed annually	11	9	7	6	43	14	21	21
WUSC obtained	11	9	6	6	38	8	38	15

external post-construction support in training or rehabilitation								
Annual General Assembly held	32	22	16	16	42	22	25	11
Average QARQ score					36	35	21	8

Table 4-32 O&M sustainability compared to age of schemes and service level (QARQ)

	Resp	Old schemes 1996-2001	New schemes 2002-2007	Over all	% of schemes (QARQ score)			
		%	%	%	Good	Moderate	Poor	Very Poor
The percentage of consumers not paying tariff is below 20%	11	8	6	6	46	31	8	15
Accumulated O&M fund (balance) is >1% of total civil works cost	33	15	24	17	49	32	8	11
The collected tariff is enough for maintenance and VMW	47	22	31	24	46	35	17	2
Accounts are audited annually	7	8	3	4	44	11	22	22
VMW/pump operator present	8	5	4	4	63	25	13	0
At least monthly scheme visit by VMW	68	28	46	35	33	38	22	7
There are sufficient tools and equipment for O&M purpose	24	5	22	12	42	38	12	8
There are sufficient spare parts / construction materials / fittings	17	8	10	9	41	59	0	0
Average QARQ score					36	35	21	8



Tap stand with multitude of tangling pipes in Thachambu W.S.P. in Thachambu VDC of Taplejung

Table 4-33 Sustainability elements by modality

Sustainability elements		Overall	DWSS	DOLIDAR	RWSSFDB	NGOs
	Resp	% schemes	%	%	%	%
Three or more WUSC meetings held in last 12 months	30	15	20	14	10	16
WUSC meeting decisions implemented	57	29	23	22	35	45
WUSC has been renewed annually	14	7	8	2	10	11
WUSC obtained external post-construction support in training or rehabilitation	13	7	9	2	8	8
Annual General Assembly held	33	17	17	20	13	18

Table 4-34 O&M sustainability by modality

O&M sustainability		Overall	DWSS	DOLIDAR	RWSSFDB	NGO
	Resp	% schemes	%	%	%	%
The percentage of consumers not paying tariff is below 20%	13	7	14	2	3	5
Accumulated O&M fund (balance) is over 1% of total civil works	37	19	17	12	28	24

cost						
The collected amount (tariff) is enough for scheme maintenance and remuneration of VMW	48	25	29	20	28	21
Accounts are audited annually	9	5	6	2	5	5
VMW/pump operator present	8	4	5	4	3	5
At least monthly scheme visit by VMW	73	38	48	25	35	39
There are sufficient tools and equipment for O&M	26	13	11	10	15	21
There are sufficient spare parts / construction materials / pipe fittings	17	9	9	8	10	8

There is not a clear difference between the implementation modalities in terms of having these sustainability related structures in place. In general a slightly higher proportion of NGO-schemes have such structures in place but in some aspects DWSS and RWSSFDB fare even better.

4.7 Cost-effectiveness

It is difficult to judge the cost effectiveness of schemes based on per capita cost indicator. Cost effectiveness depends on a variety of factors like quality of materials, remoteness of the schemes and the technology used. The per-household cost is however in itself not an indicator of cost effectiveness. For that investment needs to be related to functionality. If the estimates are built up in the same way, which is doubtful, cost effectiveness might be similar for the various modalities because the functionality also is similar. An analysis in which also project overhead and donor head quarter cost is included would be the fairest.

Table 4-35 Per Capita Cost Comparison across Modalities

Modality	Field Data	
	No. of Sample Schemes	Per Capita Cost
DWSS:		
- including Small Towns	65	4,107
- excluding Small Towns	61	3,161
DoLIDAR	44	3,354
Fund Board	40	3,449
NGOs	34	3,377

Table 4-36 Cost Effectiveness

Modalities	Sample	A - Per capita cost	B - % of schemes with good and acceptable service level (QARQ)	Cost per capita with acceptable service (A / B)
DWSS	61	3 161	63	5017
DoLIDAR	44	3 354	82	4090
RWSSFDB	40	3 449	73	4725
NGOs	34	3 377	68	4966

The table above provides analysis of cost per capita with good or acceptable service based on the survey findings (QARQ analysis). The modalities have roughly similar cost effectiveness but the DOLIDAR comes out with a bit lower cost. It must be noted that DOLIDAR schemes had the lowest percentage with good service level but the highest with moderate/acceptable.

5. Sanitation & hygiene

5.1 Processes

The amount of useful information about the sanitation modalities was limited due to the wholesale changes in implementation modalities of sanitation projects after the study period. Sanitation efforts became only more systematic and uniform after 2007. Below there is some analysis of the implemented sanitation efforts during the study period and their links to achieved sanitation results. It must be noted that the more concerted efforts for universal sanitation have become common only in the recent years and some of the areas have declared ODF after the study period – this may not be fully linked to the efforts done during 1996-2007 but rather to recent more systematic sanitation campaigns. The NGOs have been doing slightly more sanitation efforts related to the studied schemes and DoLIDAR a bit less than then the other implementing agencies.

Table 5-1 Sanitation Efforts per Modality

Sanitation related Capacity Building	DWSS	DoLIDAR	RWSSFDB	NGO	Overall
	%	%	%	%	%
Sanitation Motivator Training	22	18	35	47	28
Sanitation Volunteer Training	20	16	40	53	29
Sevika training for community training	34	22	30	53	34
Sanitation mason training	2	8	15	32	12
Sanitation Fund	0	0	5	0	1
ODF Declared*	54	63	75	82	66
No sanitation efforts noted (none of the above)	51	69	43	26	49
Limited Sanitation Efforts (1-2 trainings)	38	22	38	34	33
Full Sanitation campaign (3-4 trainign and sanitation fund)	11	10	20	39	18
Total:	100	100	101	100	100

*Declared after the study period (from 1996 to 2007).

Analysis of relationship between the sanitation efforts and sanitation results was attempted but with the data being from the old schemes and many of sanitation results from later period it was not possible to draw conclusions on these issues.



Well maintained toilet in Kumalgaun W.S.P in Kumalgaun VDC of Kalikot and one in poor condition in Yakuwa W.S.P in Ambegudin VDC of Taplejung

6. SWOT of Modalities and Modality Elements

The following SWOT table attempts to inventory the relative strengths and weaknesses of the four studied modalities, based on the results of the survey, secondary data, existing reports and discussions with stakeholders.

Table 6-1 Strength and Weakness analysis

Agency	Strength	Weakness
DWSS	Engineering know-how	Lower levels participation, due to focus on construction and contracting
	Post-project presence at district level,	Fund flow mechanism (slow and tied to annual allocations)
	Long term presence enables operation in remoter areas	Less flexibility in implementation modes
DDC-VDC	DIY modality engenders user ownership	Low level of following processes or providing support (trainings, workshops) and sustained institutions
	District Ownership	
	Post-project presence at VDC level	Low levels of accountability and lack of systems for follow-up and support
		Lack of records and monitoring
Fund Board	Elaborate processes	Less Mid-West, less remote,
	Using Lessons to improve modalities	Low level of integration with GoN-led coordination and planning system
	Uniformity across the programme	High dependence on Local Support Organisation. Regional and district absence during implementation
		Post-project absence (upto 24 months)
NGOs	More software support to users	Less remote areas
	Diversity allows cross-fertilization	Post-project absence
	More Mid-West	Donor-dependence,
	Regional and district presence during implementation	Dependence on Local Support Organisations

7. Conclusions

The study was mostly qualitative and limited in scope, partly because of how it was set up and implemented. Its main lessons are more valid where they concern specific modality elements rather than the differences between agencies. The findings suggest that functionality is for a large part determined by non-modality elements (region, geography, age, size) rather than the followed processes. We can see that the difference between the studied agencies/modalities is not large in terms of cost effectiveness, functionality and sustainability but there is clear correlation with some modality elements and processes and better sustainability of schemes. Such key elements should be focused on and ensured by all agencies.

Important elements are: a) Capacity Building and sustained activity of WUSC, b) O&M arrangements (Maintenance Fund, VMW, tools and spare parts), c) Degree of participation (in planning, procurement, construction and O&M) and do-it-yourself nature of schemes, d) scheme simplicity, e) link to VDC/DDC, f) Post-construction environment (WUSC and local technical capacity and linkages), g) quality of construction materials as well as local support and supervision.

The survey showed considerable discrepancy between NMIP scheme-wise data and field findings. E.g. the number of households differed from NMIP records by an average 30% (too high/low). Over 5% of schemes selected from NMIP data were not found at all in the field or in district level databases. There was also a large number of schemes (about 25%) where NMIP functionality status and surveyed service level were very different.

The following subchapters summarise findings related to specific modality elements.

7.1 Coordination and governance

The survey and secondary data suggest that coordination by and linkage with local governance structures is essential for sustainability of intervention results. Such linkages enhance continued backstopping and support to the users as well as increase opportunities for financial support when larger repairs are needed. This concerns mainly the VDC and the DDC. The DWASH CC and VWASH CC structures have only been instituted after the studied period and are too new to make conclusions about. Another key aspect for coordination is the networking of users' organisations. The Federation of Drinking Water and Sanitation Users Nepal (FEDWASUN) is the umbrella organization for WUSCs in Nepal that facilitates the cross learning between WUSCs and supports continued provision of services to communities through training and advocacy. Further strengthening of the federation and linking all WUSCs to such networks could strengthen the WUSCs' capability to work as sustainable service providers.

7.2 GESI/Poverty Focus

NMIP and study data suggest that women's inclusion in planning and management is beneficial. Also the schemes in poorer and remoter areas have lower levels of functionality. The seeming contradiction that guidelines have been followed less in the more advantaged eastern half of the country, but that schemes there in general perform better has to be studied in more detail. This may be partly due to more recent focus to Far- and Mid-West and with a more NGO and donor project support where processes are followed more strictly but due to other factors the results have not always been as good as in other regions. Further study should establish whether communities in the Far- and

Mid-West require less intensive support because they have become too agency-dependent or that they need more support.

7.3 Capacity building

The study findings suggest that that intensive capacity building increases the chance of sustained scheme functionality. At the other hand the DIY mode, which lacks agency-led capacity building, also produces reasonable results. The study was too limited to provide detailed insight in to which level and type of capacity building is suitable for which set of local conditions. The main lesson seems to be that a project should allow the users to build capacity and find a balance between local ownership and agency support. Also the continued WUSC managerial capacity as well as locally available technical capacity were found to have linkages to better functionality.

7.4 Technology

The study covered schemes using conventional agency-promoted technology. The exact technology need per scheme could not be studied. In many cases the DIY modality of mainly just providing building materials leads to well-functioning schemes, in other cases local people cannot maintain high-tech schemes and that many of the larger high-tech schemes with a lot of individual household taps and more professional management tend to keep functioning well. Also in some cases high-tech and high per capita cost technologies are the only solution for hard-to-reach communities due to scattered household and far distant water source (e.g. lift schemes, Rain Water Harvesting).

7.5 User participation

Where communities are expected to maintain the scheme, user participation should be maximum, with users getting the chance to lead the project intervention and to gain the required experience and skills and resources to maintain the scheme. The relative success of do-it-yourself schemes, is an indicator for this. Projects should be designed to avoid development of patronage relations or domination by agencies and local support organisations. Users' participation and ownership is important for sustainability and continued functionality of the projects. The study results showed that WUSC registration, involvement in procurement and continued WUSC activity after the project period lead to better than average functionality and service level. This indicates that promoting active user participation at all stages of project planning and implementation is important for sustainable results.

7.6 Private sector

The involvement and development of the private sector has been notably absent from most project efforts, while scheme maintenance normally would depend on the availability of materials and quality repair services.

7.7 Hardware tasks

The study findings can produce only partial analysis of how effective the task divisions are regarding hardware, e.g. scheme design, supervision and technical capacity building

based on recollection of users years after the implementation of the scheme. These tasks have been assigned to either agency staff or local support agencies. The former are often too busy to focus on a scheme very thoroughly, while the latter often lack the skills and accountability. Secondary information sources and stakeholder discussions show that hardware support remains inadequate when provided by local support organisations or technical experts visiting from outside the district. It is probable that hardware services should be provided by the district level and VDC-level agencies, probably by extra staff hired for the project, but integrated in the agency structure. The study did find that continued presence of a paid village maintenance worker (VMW), sufficient tools and spare parts at the schemes level and better construction material quality leads to sustained functionality and improved service level.



Cracking collection chamber in Nakedanda W.S.P in Jaidi VDC of Baglung

7.8 Software tasks

Similarly to the hardware tasks, the study findings allow only a partial analysis of how effective the task divisions are regarding software, e.g. scheme design, supervision and technical capacity building. These tasks have been assigned to either agency staff or local support agencies. The former have limited time to properly conduct these activities, while the latter often lack the skills and accountability, although less so than in the case of hardware. Secondary information sources and stakeholder discussions show that software support remains inadequate when provided by local support organisations or technical experts visiting from outside the district, if not properly supervised by the local agency. The problems in quality delivery of training and other software support during construction also lead to lack of sustainable institutions and technical and managerial capacity and manpower at the scheme level, only about 30% of studied schemes had a registered WUSC. These are seen as the most common reasons for system functionality problems. The study found that the most important software related elements leading to better functionality are the continued registration and activity of WUSC, users' participation, sustained managerial and technical capacity at scheme level (WUSC, VMW) and continued O&M fund collection.

7.9 Finance and Fund flow

The study findings suggest that per capita investment levels are roughly equal among agencies. The fact that Fund Board and NGO results are slightly better suggest that overall cost-effectiveness is slightly higher for these modalities while looking at the service level DOLIDAR also fares well. Fund flow issues were only studied through secondary sources, which suggest that obstacles to smooth fund flow in government agencies might be an important cause of slightly slower and less structured implementation and resulting lower functionality levels in government supported schemes, even those implemented under

specific projects. It was also found that the involvement of users in material procurement can be beneficial.

7.10 Reasons for functionality and service level issues

The reasons for functionality problems were studied to the extent possible. From the studied schemes it is seen that there is a mix of reasons – both non-modality and modality elements. There seems to be a clear correlation with some of the non-modality elements such as the ecological zone and development region with sustained level of service and functionality. Environmental calamities such as landslides and source drying are seen as a major issue in a surprisingly low percentage of schemes. Among the modality elements the institutional issues such as presence and capacity of active WUSC and VMWs etc. were found to be the most important for sustained service. Technical quality of work and materials is the second most important modality aspect in terms of sustained service.



Tap stand at Kumalgaun W.S.P in KumalgaunVDC of Kalikot district

ANNEXES

Annex 1 – Final List of Survey Schemes and Their Status

List of the Sample Schemes with status as per NMIP report and as per the survey report

SN	District	Modality	Scheme Name	VDC	Status of scheme as per NMIP	Service Status of scheme as per Survey of 2012/13
1	Baglung	RWSSFDB	Paiyunpata WSP (Dhapemul)	Paiyunpata	To be rehabilitated	Poor
2	Baglung	RWSSFDB	Pipalchauri WSP	Malika	Minor Repair	Moderate
3	Baglung	DWSS	Nakedanda WSP	Jaidi	Well managed	Good
4	Baglung	DWSS	Upplo Maraude (Kavremulabari) WSP	Binamare	Minor Repair	Poor
5	Baglung	NGO	Simle WSP (Bajhakhet)	Binamare	No information	Poor
6	Baglung	RWSSFDB	Tauka Lamkhorla WSP (Dhamakamul)	Paiyunthanthap	Minor Repair	Moderate
7	Baglung	DoLIDAR	Thulokhola Neware WSP	Rangkhani	to be reconstructed	Poor
8	Baglung	DWSS	Porepani WSP (Khunga)	Khunga	to be reconstructed	Good
9	Baglung	DoLIDAR	Khanikhola WSP	Burtibang	to be reconstructed	Poor
10	Baglung	NGO	Hatiya Pakhapani WSP (Mulachharne)	Hatiya	Well managed	Moderate
11	Baglung	NGO	Barlung (Hile) WSP	Tangram	Minor Repair	Moderate
12	Baglung	DoLIDAR	Rotepani WSP	Pala	Well managed	Moderate
13	Baglung	DWSS	Simkhet WSP	Pala	Well managed	Moderate
14	Baglung	DoLIDAR	Bajhadi WSP	Hugdishir	To be rehabilitated	Moderate
15	Baitadi	DoLIDAR	Golakot W.S.P.	Basantapur	Minor Repair	
16	Baitadi	DoLIDAR	Takare Khane Pani Yojana	Gajari	Well managed	Moderate
17	Baitadi	DWSS	Dhauladi Khane Pani Yojana	Gajari	Minor Repair	Moderate
18	Baitadi	DoLIDAR	Hukke Danda Khne Pani Yojana	Siddheshwar	To be constructed	Moderate
19	Baitadi	DWSS	Basuling Khane pani Yojana	Siddhapur	Minor Repair	Moderate
20	Baitadi	DWSS	Melauli	Melauli	Major repair	Poor
21	Baitadi	NGO	Tolaya DWS (Gaukot)	Shivanath	No information	Poor
22	Baitadi	DWSS	Maharudra D.W.S	Maharudra	Minor Repair	Very Poor
23	Baitadi	DWSS	Swal Baskoti W.S.P.	Sarmali	No information	Very Poor
24	Baitadi	NGO	Saini W.S.P.	Basantapur	Minor Repair	Poor
25	Baitadi	DWSS	Karpat W.S.P.	Durgasthan	No information	Poor
26	Baitadi	RWSSFDB	Jhaulek Khane Pani Yojana	Siddheshwar	to be reconstruct	Moderate
27	Baitadi	DoLIDAR	Panga Khane Pani Yojana	Hatairaj	Minor Repair	Very Poor

28	Baitadi	DoLIDAR	Bhitta W.S.P.	Giregada	Well managed	Poor
29	Baitadi	DoLIDAR	Salle khane pani yojana	Malladehi (additional)	Major repair	Good
30	Baitadi	RWSSFDB	Thum khane pani yojana	Gujar	Well managed	Moderate
31	Baitadi	DoLIDAR	Gadbadaya D.W.C	Sittad	Minor Repair	Moderate
32	Baitadi	DoLIDAR	Bhirad khane pani yojana	Kataunjpani	Well managed	Good
33	Baitadi	NGO	Temle khane Pani Yojana	Siddheshwar	to be reconstruct	Good
34	Baitadi	NGO	Dadakhilai Kaneopani Yojana	Talladehi	Well managed	Poor
35	Baitadi	DoLIDAR	Kholi khane pani yojana	Talladehi	Well managed	Moderate
36	Baitadi	DoLIDAR	Tusadi Khane Pani Yojana	Nwadeu	Minor Repair	Moderate
37	Baitadi	DoLIDAR	Seti Gaun Khane Pani Yojana	Sittad	Minor Repair	Moderate
38	Baitadi	DWSS	Sunkhola/birchora Khane pani Yojana	Shrikot	Minor Repair	Good
39	Baitadi	NGO	Kukudepani khane Pani Yojana	Shrikot	Well managed	Good
40	Baitadi	DWSS	Kholi Khane Pani Yojana	Bhumeshwar	Well managed	Good
41	Baitadi	NGO	Thadmal Thalgau (Machhaini gouted)	Gokuleshwar	Minor Repair	Very Poor
42	Baitadi	DoLIDAR	Mate khane pani yojana	Sikharpur	Well managed	Good
43	Dailekh	NGO	Seribada Muldhara WSP	Baraha	No information	Moderate
44	Dailekh	RWSSFDB	Paltapokhara WSP	Badabhairav	Major repair	Moderate
45	Dailekh	NGO	Malukhola	Lakuri	Major repair	Moderate
46	Dailekh	DoLIDAR	Gamaudi	Gamaudi	Major repair	Moderate
47	Dailekh	RWSSFDB	Tallochhahare WSP	Goganpani	To be rehabilitated	Moderate
48	Dailekh	DoLIDAR	Badadhara WSP	Awalparajul	To be rehabilitated	Good
49	Dailekh	NGO	Chisapani WSP	Piladi	Minor Repair	Good
50	Dailekh	DoLIDAR	Kapra	Pagnath	To be reconstruct	Moderate
51	Dailekh	NGO	Ratimata	Satala	To be reconstruct	Poor
52	Dailekh	DWSS	Barsatepani WSP	Piladi	To be rehabilitated	Very Poor
53	Dailekh	NGO	Seripata	Lakandra	Well managed	Good
54	Dailekh	DWSS	Manikadhara Simkhet	Bindhyabasini	To be reconstruct	Moderate
55	Dailekh	DoLIDAR	Asare	Kalika	Major repair	Good
56	Dailekh	DoLIDAR	Jauchour	Lakandra	Well managed	Good
57	Dailekh	DWSS	Sattala	Satala	Well managed	Poor
58	Dailekh	DoLIDAR	Nauli	Tilepata	To be reconstruct	Moderate

59	Dailekh	DoLIDAR	Nauli Lamichhane WSP	Tilepata		Poor
60	Dailekh	NGO	Gailthan	Tolijaisi	Well managed	Poor
61	Dailekh	NGO	Dwari Khola	Dwari	Major repair	Good
62	Dailekh	NGO	Bhakkemula	Pagnath	Well managed	Good
63	Gorkha	DoLIDAR	Gairagaun Lothse	Chhoprak	To be rehabilitated	Moderate
64	Gorkha	DWSS	Thulodhunga WSP	Khoplang	Major repair	Moderate
65	Gorkha	RWSSFDB	Gadkuwapani	Tarkukot	Minor Repair	Moderate
66	Gorkha	DWSS	Jugepani	Taple	Minor Repair	Moderate
67	Gorkha	NGO	Gahiripandhera	Taple	Minor Repair	Good
68	Gorkha	DWSS	Chhatyungaira	Ghyalchok	to be reconstructed	Poor
69	Gorkha	DoLIDAR	Andherikhola	Taple	Minor Repair	Poor
70	Gorkha	DWSS	Boksekhola	Chhoprak	Minor Repair	Good
71	Gorkha	NGO	Silingtar	Manakamana	Major repair	Good
72	Gorkha	RWSSFDB	Dhawadighat (ghabdiyaghat)	Ghyalchok	Minor Repair	Poor
73	Gorkha	DWSS	Siureni	Thalajung	Well managed	Good
74	Gorkha	DWSS	Tutunga	Chhoprak	To be rehabilitated	Moderate
75	Gorkha	DWSS	Snan	Warpak	Minor Repair	Good
76	Gorkha	NGO	Patle	Simjung	Minor Repair	Good
77	Gorkha	NGO	Arkhet-Dhodeni	Thumi	Minor Repair	Good
78	Gorkha	DoLIDAR	Kotalechour	Borlang	To be rehabilitated	Moderate
79	Gorkha	NGO	Dhunchet	Manbu	Minor Repair	Good
80	Gorkha	DoLIDAR	Kamikhola	Dhuwakot	to be reconstructed	Moderate
81	Gorkha	RWSSFDB	Pokharikhola (pokharikhola)	Panchkuwa Deurali	Major repair	Moderate
82	Gorkha	DoLIDAR	Dahalgau	Tandrang	Well managed	Good
83	Gorkha	DWSS	Kamaltar-Khamare	Tandrang	Well managed	Poor
84	Gorkha	DoLIDAR	Devithan	Kharibot	Well managed	Good
85	Makwanpur	DWSS	PAL DAMAR WSP	Handikhola	No possible reoperation	Very Poor
86	Makwanpur	DWSS	Daman	Daman	To be rehabilitated	Good
87	Makwanpur	RWSSFDB	MUKHAYA TOLE WSP	Handikhola	Well managed	Poor
88	Makwanpur	RWSSFDB	Aapkhola WSP	Phaparbari	To be rehabilitated	Good
89	Makwanpur	DWSS	Kali Khola 2nd WSP	Phaparbari	To be reconstructed	Moderate
90	Makwanpur	DoLIDAR	Takuwa	Kalikatar	Major repair	Good
91	Makwanpur	DWSS	Indra Danda	Tistung	Well managed	Poor
92	Makwanpur	RWSSFDB	Mathillo Bisingkhel	Chitlang	Well managed	Good

93	Makwanpur	DoLIDAR	Okharbot	Chitlang	To be rehabilitated	Good
94	Makwanpur	DWSS	Deurali WSP	Ipa Panchakanya	To be rehabilitated	Moderate
95	Makwanpur	NGO	Narsingdanda WSP	Sukaura	To be reconstructed	Good
96	Makwanpur	NGO	Lingkheta	Bhimphedi	Minor Repair	Good
97	Makwanpur	NGO	Lekkhola	Nibuwatar	To be rehabilitated	Good
98	Makwanpur	DWSS	Dhungri Khola WSP	Shikharpur	Minor Repair	Good
99	Makwanpur	RWSSFDB	Thulo Bafal WSP	Dhiyal	To be rehabilitated	Moderate
100	Makwanpur	RWSSFDB	Bhokteni Chisapani WSP	Shripur Chhatiwani	Minor Repair	Good
101	Makwanpur	DWSS	Kalikhola Dumre WSP	Phaparbari	To be reconstructed	Very Poor
102	Makwanpur	DWSS	Puwale WSP	Hatiya	Minor Repair	Moderate
103	Okhaldhunga	DoLIDAR	Chhoding (Chhuding)	Patale	Major repair	Moderate
104	Okhaldhunga	DoLIDAR	Harebole Ratuwa Pani	Betini	Major repair	Good
105	Okhaldhunga	RWSSFDB	Uttise	Barnalu	Minor Repair	Moderate
106	Okhaldhunga	DWSS	Bhalukhop	Ketuke	Minor Repair	Good
107	Okhaldhunga	DoLIDAR	Torikhoria	Okhaldhunga	Minor Repair	Poor
108	Okhaldhunga	DoLIDAR	Basbot	Tuluwa	Minor Repair	Moderate
109	Okhaldhunga	DWSS	Pemsane	Ragadeep	To be rehabilitated	Poor
110	Okhaldhunga	DoLIDAR	Chapleti	Shrichaor	Well managed	Moderate
111	Okhaldhunga	DoLIDAR	Mul Guherumti	Prapcha	Well managed	Good
112	Okhaldhunga	DoLIDAR	Karki Gaun	Harkapur	Minor Repair	Poor
113	Okhaldhunga	DWSS	Surkenagi DWSS	Katunje	Minor Repair	Good
114	Okhaldhunga	DoLIDAR	Lahareni	Phulbari	Minor Repair	Good
115	Okhaldhunga	DWSS	Kande Khola	Phedighooth	Minor Repair	Poor
116	Okhaldhunga	DoLIDAR	Takarpur	Ragani	Well managed	Good
117	Okhaldhunga	DoLIDAR	Blyankha	Manebhanjyang	Well managed	Moderate
118	Bajhang	NGO	Kanda	Surma	Major repair	Moderate
119	Bajhang	RWSSFDB	Bhakbhake	Lamatola	To be rehabilitated	Moderate
120	Bajhang	DWSS	Lotu	Bhairavnath		Good
121	Bajhang	DWSS	Dandagaun	Bhanchaur		Good

122	Bajhang	DWSS	Bhamka	Koiralakot	to be reconstructed	Good
123	Bajhang	NGO	Dhamigaun, Simlek	Parakatne	Major repair	Good
124	Bajhang	DoLIDAR	Kyuchaka	Bhatekhola	to be reconstructed	Moderate
125	Bajhang	DWSS	Thulakhola (Majhgoun)	Majhigaun	To be rehabilitated	Good
126	Bajhang	NGO	Korsel (Ruptola)	Dhamena	Minor Repair	Poor
127	Bajhang	DWSS	Rupatola	Dhamena	To be rehabilitated	Poor
128	Bajhang	NGO	Thakunna	Rilu	Well managed	Good
129	Bajhang	NGO	Dhamigaun	Bhatekhola	Major repair	Very Poor
130	Bajhang	RWSSFDB	Dogadi	Deulikot		Good
131	Kalikot	DWSS	Matell W.S.P.	Daha Phalgaun	Minor Repair	Poor
132	Kalikot	RWSSFDB	Jharinemul W.S.P.	Foi Mahadev	to be reconstructed	Poor
133	Kalikot	DWSS	Ghattemul W.S.P.	Chhapre	To be rehabilitated	Poor
134	Kalikot	DWSS	Rupsa Skim-1, Kha.Pa.Aa	Rupsa	Well managed	Moderate
135	Kalikot	NGO	Malkot.Kha.Pa.Aa	Malkot	Well managed	Moderate
136	Kalikot	DoLIDAR	Sukatinya Kha.Pa.Aa	Sukatinya		Good
137	Kalikot	DWSS	Kumalgaun Skim-4 Kha.Pa.Aa	Kumalgaun	Well managed	Poor
138	Sindhupalchok	DWSS	Dahakhola (Daudhara Mul)	Bansbari	Minor Repair	Moderate
139	Sindhupalchok	RWSSFDB	Chanaut Mul	Tatopani	Well managed	Moderate
140	Sindhupalchok	DWSS	Bindu Khola Mul	Gumba	Minor Repair	Very Poor
141	Sindhupalchok	DWSS	Pakuwa Mul	Listikot	Minor Repair	Moderate
142	Sindhupalchok	RWSSFDB	Malukharka Mul	Ghunsakot	To be rehabilitated	Poor
143	Sindhupalchok	RWSSFDB	Jireghari	Batase	To be rehabilitated	Good
144	Sindhupalchok	RWSSFDB	Dhije Mul	Shikharpur	Minor Repair	Good
145	Sindhupalchok	NGO	Urleni Kholsa	Lisankhu	Minor Repair	Poor
146	Sindhupalchok	RWSSFDB	Thado (Hatikuna Mul)	Tatopani	Well managed	Good
147	Sindhupalchok	RWSSFDB	Kyamule Muhan	Shikharpur		Good
148	Sindhupalchok	RWSSFDB	Thada Sim Khola (Chisa Pani Mul)	Piskar	Minor Repair	Moderate
149	Sindhupalchok	RWSSFDB	Gogarna Mul	Thanpaldhap		Poor
150	Sindhupalchok	DWSS	Ratopani Mul	Thulo Sirubari	Major repair	Poor
151	Sindhupalchok	DWSS	Karkani Mul	Listikot	Major repair	Moderate
152	Sindhupalchok	DWSS	Chang Change Mul	Gumba	No information	Very Poor

153	Sindhupalchok	DoLIDAR	Patale Mul	Batase	to be reconstructed	Moderate
154	Sindhupalchok	NGO	Silku Khola	Sunkhani	Minor Repair	Good
155	Sindhupalchok	DWSS	Thakuri Sim Mul (Tirtiya)	Sunkhani	Well managed	Good
156	Sindhupalchok	RWSSFDB	Gagnai (Bhugol) Khola WSP	Thumpakhar	Minor Repair	Good
157	Sindhupalchok	RWSSFDB	Bato Dada Mul	Thulo Pakhar	Major repair	Very Poor
158	Sindhupalchok	RWSSFDB	Yes Nari/ Sano khola Mul	Pedku	Minor Repair	Poor
159	Sindhupalchok	DWSS	Dharpa WSP	Barhabise	Minor Repair	Moderate
160	Sindhupalchok	RWSSFDB	Bhote Namlang	Gati	Minor Repair	Good
161	Taplejung	DWSS	Thechambu W.S.P.	Thechambu	Minor Repair	Good
162	Taplejung	NGO	Jayakrishana W.S.P.	Hangpang	Well managed	Moderate
163	Taplejung	DWSS	Chhage Khola W.S.P.	Yamphudin	to be reconstructed	Moderate
164	Taplejung	DWSS	Hanggode W.S.P.	Khokling	Minor Repair	Good
165	Taplejung	RWSSFDB	Kewakhola W.S.P.	Khewang	Well managed	Moderate
166	Taplejung	DoLIDAR	Miring Khola W.S.P.	Niguradin	Minor Repair	Moderate
167	Taplejung	DWSS	Yakhuwa W.S.P.	Ambegudin	Major repair	Good
168	Dang	RWSSFDB	Singhe Kha.Pa.Aa	Sisahaniya	No information	Poor
169	Dang	NGO	Pareni Naya Basti Kha.Pa.Aa	Narayanpur	No possible reoperation	Good
170	Dang	RWSSFDB	Gordhara Kha.Pa.Aa	Saigha	Major repair	Very Poor
171	Dang	NGO	Badahara Kha.Pa.Aa	Gobardiha	Well managed	Poor
172	Dang	DWSS	Chimchime Kha.Pa.Aa	Gobardiha	Well managed	Poor
173	Dang	DoLIDAR	Surkedangi Kha.Pa.Aa	Rampur		Moderate
174	Dang	DWSS	Karange Kha.Pa.Aa	Sisahaniya	Major repair	Poor
175	Kailali	DWSS	Khairana	Malakheti	Well managed	Moderate
176	Kailali	RWSSFDB	Jaljala Basreni	Sahajpur	Well managed	Good
177	Kailali	DWSS	Okhaldhunga Khimadi	Pandaun	To be rehabilitated	Moderate
178	Kailali	NGO	Chorpani	Sahajpur	Well managed	Moderate
179	Kailali	DoLIDAR	Ratakhal Jilaute Phalate	Mohanyal	Minor Repair	Moderate
180	Kailali	DWSS	Katthur	Mohanyal	to be reconstruct	Very Poor
181	Mahottari	NGO	Khairmara (Indrakali Banke Khola)	Khairmara	Minor Repair	Poor
182	Mahottari	RWSSFDB	Khairmara	Khairmara	Minor Repair	Good
183	Morang	DoLIDAR	Sepikhola WSP	Tandhi	Minor Repair	Moderate
184	Nawalparasi	RWSSFDB	Keaura Khanepani Tatha Sar-safai	Gaindakot	Minor Repair	Good

			Yojana			
185	Nawalparasi	RWSSFDB	Dibaya Nagar Khanepani Tatha Sarsafai	Makar	Minor Repair	Very Poor
186	Nawalparasi	DWSS	Jamere Scheme Khanepani Yojana	Dumkibas	Minor Repair	Moderate
187	Nawalparasi	RWSSFDB	Siseni Khanepani Tatha Sar-safai Samitti	Dumkibas	Minor Repair	Moderate
188	Nawalparasi	DoLIDAR	Dharadi Khanepani Tatha Sarsafai Upbhokta Samitti	Rakachuli	to be reconstruction	Moderate
189	Nawalparasi	DWSS	Deurali Soti Khola Khanepani Tatha s.s.u.sastha	Deurali	No possible reoperation	Good
190	Nawalparasi	RWSSFDB	Samda Khanepani Tatha Sarsafai Yojana	Deurali	No possible reoperation	Good
191	Nawalparasi	DoLIDAR	Thakur Gaira	Dhauwadi	Minor Repair	Moderate
192	Nawalparasi	DWSS	Balwadada Khanepani Yojana	Shivamandir	Well managed	Moderate
193	Nawalparasi	DoLIDAR	Petauji	Mukundapur	To be rehabilitated	Moderate
194	Nawalparasi	DWSS	Makar Chisapani Khanepani Tatha Sar Safai Mul Upbhokta Samitti	Makar	Minor Repair	Good

List of the Small Town's Schemes

SN	District	Modality	Scheme Name	VDC		
1	Okhaldhunga	DWSS	Okhaldhunga	Okhaldhunga	to be rehabilitated	Good
2	Dang	DWSS	Hapur Kha.Pa.Aa Skim-2	Hapur		Moderate
3	Kailali	DWSS	Bargada	Baliya		Very Poor (Good)
4	Mahottari	DWSS	Bardibas	Bardibas	to be rehabilitated	Very Poor (Good)
5	Morang	DWSS	Belbari STWSP	Belbari	no information	Moderate
6	Morang	RWSSFDB	Jalakanya WSP	Kerabari	well managed	Moderate

List of the Pumping Type Schemes

SN	District	Modality	Scheme Name	VDC		
1	Morang	DWSS	Urlabari WSP	Urlabari	no information	Good
2	Morang	DWSS	Belbari STWSP	Belbari		Moderate

Annex 2 – List of Changes in Survey Schemes from original

List of scheme planned are changed during survey due to several reasons are as following:

Bajhang District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Gadaraya	Chhapre Bajh	Fund Board	Lamatola	Bhakbhake	Fund Board	Alternate scheme
2	Daulichaur	Gurina	Fund Board	Daulichaur	Dogadi	Fund Board	Name changed
3	Bhairab Nath	Maubheri	DWSS	Bhairab Nath	Latu	DWSS	Maubheri was implemented by Plan
4	Parakatne-7,8	simlekh	Fund Board	Parakatne-7,8	simlekh	UDAYA Himalayan Network	Modality changed

Baitadi District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Sigas	Gajind	Dolidar	Siddeshore	Hukedanda	Dolidar	Alternative Scheme
2	Mahakali	Danga	DWSS	Sarmali	Swal Baskoti	DWSS	Alternative scheme
3	Shivanath	Gaunkot	Newah	Shivanath	Tolya	Newah	Location changed
4	Basantapur	Saini	Dolidar	Basantapur	Saini	NGO	Modality changed
5	Talladehi	Dandakhali	Dolidar	Talladehi	Dandakhali	Care	Modality Changed
6	Durgasthan	Karpat	Fund board	Durgasthan	Karpat	DWSS	Modality Changed

Nawalparasi District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Tilakpur	Wasabasahi	DWSS	Makar	Makar Chisapani	DWSS	Location Changed
2	Bulingtar	Kotpandhero	DWSS	Deurali	Deurali	DWSS	Location changed

Kailali District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Godavari	Chhap Salleri	Newah	Sahajpur	Chorpani	Newah	Alternate Scheme

District Gorkha

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Gyalchowk	Jyamireghat	Fundboard	Gyalchowk	Dhawadig hat	Fund Board	Alternative Scheme
2	Taple	Kaledandabadi	DWSS	Taple	Andherikhola	Dolidar	Modality Changed
3	Khoplang	Thulopakha	DWSS	Khoplang	Thulodhunga	DWSS	Scheme name changed
4	Chhoprak	Thikka	DWSS	Chhoprak	Tutunga	DWSS	Scheme name changed
5	Uhia	Tarwang	Care Nepal	Thumi	Arkhet Dhodeni	Care Nepal	Primary scheme is located in too remote area
6	Tandrang	Dahalgoun Skim	DWSS	Tandrang	Dahalgoun Skim	Dolidar	Modality changed
7	Chopprak-8	Thikka	DWSS	Chopprak-8	Tutunga	Dolidar	Modality changed

Kalikot District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Chilkha ya	Martha Dharamul	DWSS	Chhapre	Ghattemul	DWSS	Primary scheme location was affected by heavy snow fall during survey period and changed to other place
2	Thirpu	Damanigad	Care Nepal	Malkot	Malkot	Care Nepal	Primary Scheme could not identified
3	Thirpu	Damanigad	Dolidar	Sukatiya	Sukatiya	Dolidar	Primary Scheme could not identified

Taplajung District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Hangpan g	Jaya Krishna	Dwss	Hangpan g	Jaya Krishna	GWS	Modality changed

Morang District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Tandi	Seti	Dolidar	Tandi	Sepi	Dolidar	Only scheme name

		Khola			khkola		changed
2	Urlabari	Samuday ikha.pa.	DWSS	Urlabari	Urlabari	DWSS	Name changed

Mohattari District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Mahisthan	Jagakhola	Fund board	Khairmara	Khairmara	Fund board	Alternative scheme

Okhaldhunga District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Barunashwor	Juka	Dollidar	Manabhajnyang	Blankha	Dollidar	Alternate scheme
2	Botini	Haribole	Fund Board	Botini	Haribole	Dolidar	Modality changed
3	Prapcha	Mul Gerumati	Fund Board	Prapcha	Guherumti	Dolidar	Modality changed
4	Srichaur	Chapleti	Fund Board	Srichaur	Chapleti	Dolidar	Modality changed

Sindhupalchock District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Thulopkar	Batodada	Dollidar	Thulopkar	Batodanda (Birsingh)	Fund board	Modality changed
2	Thumpakhar-2	Bhugol	Fund board	Thumpakhar-2	Gogarnekhola	Fund board	Scheme name changed
3	Ichowk-2	Bhutkhola	Fund Board	Batase-5	Jireghari	Fund Board	Alternate Scheme
4	Piskar-2,3	Chisapani Khola	Fun board	Piskar	Thade simkhola (Chisapani mul)	Fund board	Scheme name Changed
5	Listikot-4	Nobukhola mul	Fund board	listikot	Karkani Ghyang mul	DWSS	Modality changed
6	Listikot-1	Karkane mul	DWSS	Listikot-1	Pakuwamul	DWSS	Scheme name changed
7	Pedku-2	Bato odar	Fund board	Pedku	Es Narimul	Fund board	Scheme name Changed
8	Sikharpur	Dhakarpa	Fund	Sikharpur	Kyamune	Fund board	Scheme name

		mul	board				Changed
9	Shikharpur	Dhakarpar	Fund board	Shikharpur	Kyamune Mul	Fund board	Scheme name changed
10	Bandagan	Bamudharo	Care Nepal	lishankhu	Urlenikholsa	Care Nepal	Location changed
11	Thangpaldhap	Mauttisini	Fund board	Thangpaldhap	Gogarmemul	Fund board	Scheme name changed
12	Helambu	Chapsekhola	Fund board	Tatopani	Thado Mul	Fund board	Location changed
13	Basbari	Dahakhola	DWSS	Basbaris	Deudhara	DWSS	Scheme name changed
14	Gumba-7,8	Bindukhola	FB	Gumba	Bindukhola	DWSS	Modality changed
16	Sunkhani-9	Sallekhola	FB	Sunkhani-9	Silke khola	IHDP	Modality changed

Makawanpur, District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Sukaura	Narsingdanda	DWSS	Sukaura	Narsingdanda	RADO Nepal (NGO)	Modality Changed
2	Nibuwatar	Lekkhola	Fund Board	Nibuwatar	Lekkhola	NGO	Modality Changed
3	Bhimphedi	Linkhet	Fund Board	Bhimphedi	Linkhet	Plan International	Modality Changed

Dailekh, District

Sn	Primary VDC	Primary Scheme	Modality	Surveyed VDC	Surveyed Scheme	Modality	Remarks
1	Goganpani	Tallo Chhaharepani	DWSS	Goganpani	Tallo Chhaharepani	Fund Board	Modality Changed
2	Tilepata	Naule	DWSS	Tilepata	Naule	Dolidar	Modality Changed

Annex 3 – Water Quality Index

Paremeter	National standard	Meets standard	Doesn't meet standard	Points for meeting standard
Temperature °C				0
Odour(observed)	unobjectionable			2
Taste (observed or ask)	unobjectionable			5
Colour (observed)	unobjectionable			3
Turbidity (observed)				5
pH	6.5-8.5			5
Ammonia mg/l	1.5 mg/l			10
Iron mg/l	0.3 mg/l			5
Hardness mg/l	500 mg/l			10
Coliform bacteria	not to be present			40
Arsenic mg/l or ppb	0.005 mg/l			15
				100

Considered to be met in hill/mountain/gravity

Quality	Good (80-100)	Moderate (51-80) = Acceptable	Poor/not drinkable (<50)
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Annex 4 – Analysis of NMIP Data

Introduction

The NMIP database provided by MUD to the study team contained 28,455 schemes from across the country, although it excluded most Terai schemes, schemes with less than ten households and urban schemes. The consultants are aware that the NMIP database is inaccurate and incomplete, but also realize that it is still the best database in Nepal and that by the sheer number of included schemes it provides often statistically more significant data than the present study of 200 schemes. It can serve as cross-check and sometimes as replacement of the 200 studied schemes.

This database has been analyzed for modality and functionality indicators and few tables have been include in this annex.

The NMIP database provides the condition of each scheme categorising them as well-managed, needing minor repairs, needing major repairs, needing rehabilitation, needing reconstruction and irreparable. For the purpose of this study, these categories have been allotted scores, so that average scores could be calculated for different factors and modality elements.

Table 1: Scheme Condition Categories and Scores

Score	Condition Description
0	Irreparable
1	Reconstruction
2	Rehabilitation
3	Major repairs
4	Minor repairs
5	Well-managed

Scheme Characteristics

About half the schemes in the database are built under DWSS. Average differences in scheme size and age are small, although DWSS schemes tend to be on average a bit larger and older. About 50% of the schemes has less than 200 users and only a small portion of schemes is above 1000 users, which has become the boundary between DWSS and Dolidar in more recent times.

Table 2: Characteristics

Category	No. of schemes in database	Average Pop. size	Average Age (yr)	Average Pipe Length
DWSS	15,088	233	16	7
DDC-VDC	6,766	121	15	5
Fund Board	3,865	151	14	7
NGO	2,492	190	14	11
Total	28,455	191	15	7

Of all the schemes 68% have water for 24 hours per day, and 34% have water for 24 hours per day and about 64% of schemes is are well-managed and functioning or at most need minor repairs.

Table 3: Scheme Reliability, Annual Number of Months Water Availability

Months	All (No.)	All (%)
12	16248	68%
11	752	3%
10	2681	11%
9	1278	5%
8	1216	5%
7	260	1%
6	744	3%
<6	855	4%
Total	24034	100%

Table 4: Scheme Reliability (Hours of water per day)

Hours/day	All (No.)	All (%)
24	8267	34%
4-23	13112	55%
<4	2634	11%
Total	24013	100%

Table 5: Percentage of Schemes by Condition and Modality

Scheme Condition	All (No.)	All (%)
Irrepairable	378	1%
To Reconstruct	2600	10%
To Rehabilitate	3563	13%
Needs Major repair	3218	12%
Needs Minor repair	11624	44%
Well managed	5268	20%
Total	26651	100%
Functional (Minor repair & well managed)		64%

Non-Modality Factors and Functionality

Most schemes are mostly located in the hills, where most of the studied schemes are located. Also more schemes are located in the East, Central and West, where populations are larger. Location is an important factor determining functionality. Schemes in the Far- and especially Mid-West(3.0) have lower functionality scores than in the other regions. Further differences exist within regions and zones. Mountains score less than hills, probably due to their remoteness and lack of access to services. E.g. Karnali zone, the country's most remote and poor zone has also the lowest levels of functionality (2.5),

while in the Karnali Humla district, one of the remotest districts of Nepal, has again a lower level(2.3).

Table 6: Region and Zone

Region	No.	Funct. Score
E	5807	3.6
C	6808	3.6
W	8543	3.5
MW	4150	3.0
FW	3146	3.4
Total	28454	3.5

Table 7: Location and Functionality

Region	No.	Funct. Score
Mountain	4,868	3.2
Hill	22,364	3.5
Terai	1,222	3.4
Karnali	604	2.5
Huma	43	2.3

When studying differences within districts, the district of Pyuthan, a district in the centre of Nepal with a large number of schemes, is used as an example of how differences play out within districts. It appears that schemes close to the main roads and bazaars do relatively well, but that once away from the main road there are not many differences anymore. Many of those other areas have local roads, but no bus services or main bazaars. Assuming that poverty, education levels and access to government services do not differ much if you live 1 or 4 hours away from the main road, the level of access to repair services in bazaars might be an important factor.

Table 8: Remoteness and Functionality, Pyuthan

remoteness score	No. Schemes	Functionality rate
1=Along main roads	217	3.9
2= One VDC from main road	231	3.5
3=Two VDC from main road	128	3.4
4= ~0.5 day walk from any road	116	3.6

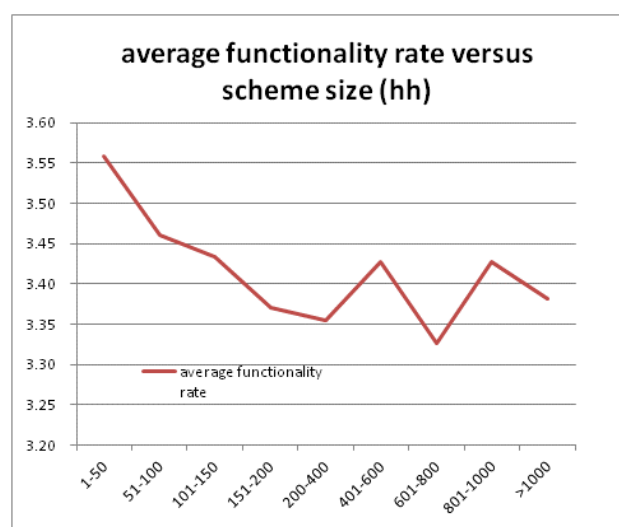
Scheme size does not seem to affect functionality significantly, although the smallest schemes seem to do better. The main reason might be higher levels of simplicity and community cohesion for small schemes.

Table 9: Population Size and Functionality

Population	no of schemes	average functionality rate
1-50	6,200	3.6

51-100	6,158	3.5
101-150	3,464	3.4
151-200	2,627	3.4
200-400	2,534	3.4
401-600	1,280	3.4
601-800	1,084	3.2
801-1000	735	3.4
>1000	557	3.3
Total	24,639	3.5

Figure 1: Scheme Size and Functionality



A similar picture emerges when considering total pipe length as a scheme size indicator. The table also shows that the majority of schemes is less than 2km long.

Table 10: Scheme Size (pipe length) & Functionality

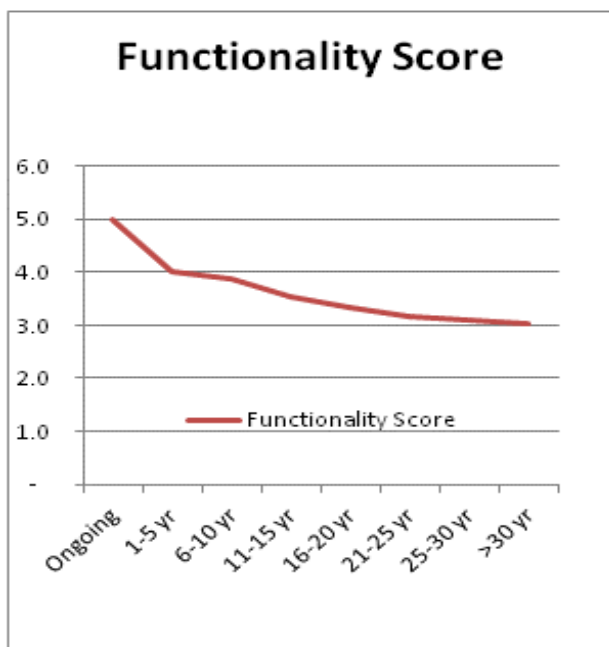
Pipe length (km)	No.	%	Functionality Score
1	7068	29%	3.5
2	7877	33%	3.4
3	2527	10%	3.3
4	2405	10%	3.3
5	1097	5%	3.3
6	799	3%	3.3
7	398	2%	3.4
8	449	2%	3.3
9	193	1%	3.2
10	273	1%	3.3
>10	983	4%	3.3
Total	24069	100%	3.5

Scheme age logically has an effect on scheme functionality. Whereas the newest schemes are on average in the “needing minor repairs” category (4), schemes of 20 years and older are on average in the “needing major repairs” category(3).

Table 11: Scheme Age and Functionality

Age Group	No.	Functionality Score
1-5 yr	1,737	4.0
6-10 yr	4,586	3.9
11-15 yr	9,560	3.5
16-20 yr	6,949	3.3
21-25 yr	2,900	3.2
25-30 yr	1,806	3.1
>30 yr	821	3.0

Figure 2: Functionality and Age



Modality Elements and Functionality

The study focuses on modality elements that are dealt with differently by the various agencies. These include the elements listed in the overview report. The following subchapters check which elements might impact functionality and whether there are differences between the agencies.

1. Coordination at national, district and VDC level
2. Selection of schemes
3. Mobilization and Organization
4. Technology
5. Construction
6. O&M and Post-construction services

Selection

1. Dealing with Remote Areas

The following two tables, for one sample district show that in at least one district, DWSS ends up in remoter VDCs than the other three categories. This phenomenon has been observed before, even though NGOs often make concerted efforts to reach the unreached. It has been traced to the limitations of funding, i.e. donors limiting the period of funding and demanding high numbers of beneficiaries, which both often force NGOs to include easier locations with higher numbers of beneficiaries, in other words, less remote areas. Fund Board also has been evaluated before as focusing on the more easier areas, but has corrected this situation in more recent years.

Table 12: Pyuthan Schemes, NMIP data base

Agency	Average Remoteness score	No. schemes	Average Func Score	Average Pop. size
DWSS	2.4	330	3.5	233
DDC-VDC	2.0	299	3.6	101
Fund Board	2.0	17	3.8	227
NGO	1.9	41	4.2	262
		692		

Table 13: Reaching the Remote Areas (Example Pyuthan)

Remoteness Category	Total	All	DWSS	DDC-VDC	Fund Board	NGO
No. schemes:		692	330	304	17	41
Along Main Road (1)	217	31%	24%	38%	41%	37%
1 VDC from Main Road (2)	231	33%	32%	34%	18%	46%
2 VDC from main Road (3)	128	18%	24%	13%	41%	5%
>4hr walk from roadhead or >4hr drive from DtHQ (4)	116	17%	21%	14%	0%	12%
Total	692	100%	100%	100%	100%	100%

The Humla table below is added to illustrate the low functionality scores, the lack of non-government actors and the difficulty of obtaining data (50% schemes no functionality data) in extremely remote areas which lack capable local NGOs, overall local capacity and where the skills and materials needed for maintenance of schemes are nearly unavailable.

Table 14: Humla Data

	No. Schemes	Av. No. of Users	Functionality Entries	Av. Func Score
DWSS	75	153	31	2.32
DDC-VDC	16	80	8	1.88
Fund Board	6	61	4	3.25

NGO	0	NA	0	NA
Overall	97		43	2.33

The lack of Fund Board study schemes in the Far- and Mid-West results from the overall lack of Fund Board Schemes in those regions. This fact is important as scheme performance in those regions is relatively lower and more schemes there will suppress the overall results. Moreover, as shown in the table, the overall poverty and the WASH needs are higher in those regions.

Table 15: Presence in Five Regions

Description	% schemes in FW & MW	% schemes in E, C & W
DWSS	30%	70%
DDC-VDC	26%	74%
Fund Board	8%	92%
NGO	23%	77%
All	26%	74%
Population	22%	78%
HH with piped water supply (NLSS 2010 2011)	58%	71%
HDI 2010	0.397	0.483

Modality Elements and Functionality

The NMIP database contains also limited information about scheme management that can be related to modalities, notably the WUSC registration, percentage of women in the WUSC, the number of WUSC meetings, the availability and remuneration of a maintenance worker (VMW), the availability of tools and maintenance funds and the practicing of water fees. These figures do not show the direction and intensity of the effort during implementation, only the post-implementation results and left-overs. Correlations are general low, although they are consistently higher in the Far- and Mid-West (see lowest row in next table), where elements have been practiced with more effort, it seems, and extra weak in the Central and East.

In general, if these scheme management elements are management performance indicators, then only 20% of schemes can be said to be well managed. Among the agencies, NGO supported schemes score significantly higher than others, while DDC-VDC supported schemes score significantly lower.

Table 16: Modality Elements per Agency

Agency/ Category	% WUSC Registered	Average % women in WUSC	% schemes with VMW	% schemes that pay VMW	% schemes with MF >0Rs	% schemes where hh pay Water Fee	% schemes with Maintenance Tools
DWSS	33%	21%	26%	22%	20%	21%	26%
DDC-VDC	19%	20%	14%	12%	10%	12%	14%
Fund Board	27%	23%	22%	19%	15%	19%	22%
NGO	31%	24%	39%	33%	31%	32%	39%

Total	29%	22%	24%	20%	18%	20%	24%
FW and MW	33%	21%	26%	22%	21%	21%	26%

The following table reviews whether and how those management elements are related to scheme performance. It appears that there is only a slight correlation. Schemes that are overall in better condition also tend to score better on WUSC registration, maintenance funds and availability of tools.

Table 17: Post-Construction Situation

Modality Elements	Positive Responses	All schemes Functionality score
Registered WUSC	8,127	3.5
VMW	6,707	3.6
Maintenance Fund (>Rs 0)	5,010	3.6
Maintenance Tools	7,214	3.7
All schemes	28,455	3.5

Similarly, there is a slight correlation between the frequency of WUSC meetings and scheme performance. The presence of women in the WUSC can also be linked to better scheme performance between 0% and about 40%, after which it does not make a notable difference.

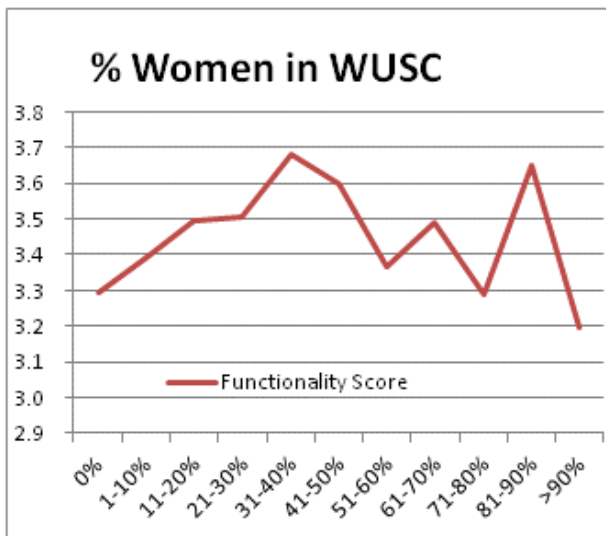
Table 18: WUSC Meeting Frequency and Scheme Performance

WUSC Meetings/yr	No. WUSC responses	Functionality score
0 meetings	309	3.4
1-3 meetings	5,031	3.6
4-6 meetings	1,996	3.6
7-9 meetings	312	3.6
10-12 meetings	1,096	3.8
Total	8,744	3.6

Table 19: Presence of Women in the WUSC and Scheme Performance

% women in WUSC	No. schemes	Functionality Score
0%	2284	3.3
1-10%	409	3.4
11-20%	3856	3.5
21-30%	5015	3.5
31-40%	1585	3.7
41-50%	698	3.6
51-60%	144	3.4
61-70%	49	3.5
71-80%	48	3.3
81-90%	20	3.7
>90%	104	3.2

Figure 3: % Women in the WUSC



VMWs get paid in only 6000 of 28000 schemes that responded. On average these schemes pay NRs 896 per month, which is 25% of an unskilled labourer’s income . The correlation between VMW remuneration and other scheme performance seems insubstantial (3.6 versus 3.4 for schemes that don’t report such remuneration).

Table 21: VMW Remuneration

	VMW Remuneration	Average Functionality Score
0 Rs	308	3.5
>0 NRs	5,739	3.6
>1000 NRs	1,176	3.5
>5000 NRs	78	3.4
>50000 NRs	-	NA
Total	6,047	3.6
Blank	22,407	3.4

Only 20% of schemes has a maintenance fund, which are on average NRs 20,331 big. There correlation between maintenance funds and scheme performance appears to be minimal (3.6 versus 3.4 for schemes that don’t report such funds).

Table 22: Maintenance Fund

	Maintenance Fund	Average Functionality Score
0 Rs	295	3.5
>0 NRs	5,542	3.6
>1000 NRs	5,010	3.7
>5000 NRs	3,040	3.7
>50000 NRs	361	3.7
Total	5,837	3.6
Blank	22,617	3.4

Water fees are paid in about 25% of all schemes. The average fee is NRs 54 per month. Similarly to other maintenance related indicators, there is no strong correlation with scheme performance (3.6 versus 3.4).

Table 23: Water Fee

(Average Water Fee is NRs 54/m)

Water Fee	No. Responses	Average Functionality Score
0	292	3.5
>0 NRs	5,553	3.6
>25 Rs	648	3.6
>100Rs	85	3.5
>500	17	3.6
Total Responses	5,845	NA
Blank	22,609	3.4

Differences between Modalities

As has been seen in the previous chapters, modalities differ in location , average age and the adherence to processes, which all in turn affect scheme performance. The remarks column in the table below only contains explanatory causes that emerged from chapters before. Other factors will be covered further on in the report. The table shows that the average scheme for all modalities is somewhere between needing minor repairs (score 3) and needing major repairs(score 4). The percentage of functioning schemes is notably higher for NGOs and Fund Board (both 73%)

Table 24: NMIP Functionality for Various Categories

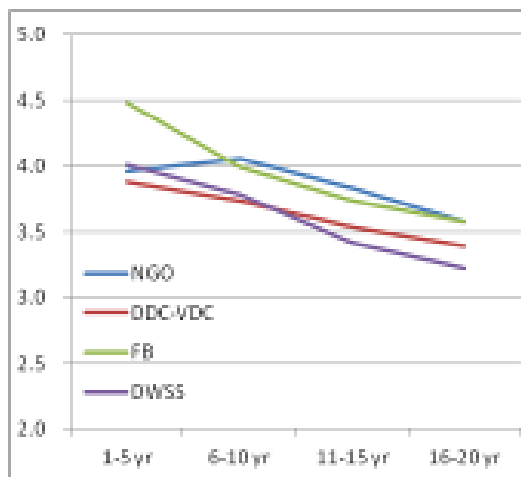
Modality	Functionality score	% functioning schemes	Remarks
DWSS	3.33	64%	More remote,
DDC-VDC	3.49	56%	Following less processes
Fund Board	3.72	73%	Less remote, more East
NGO	3.76	73%	More following process, less remote
Overall	3.46	64%	

Table 25: Percentage of Schemes by Condition and Modality

Scheme Condition	All (No.)	All (%)	DWSS %	DDC-VDC %	Fund Board %	NGO %
Irreparable	378	1%	2%	1%	1%	1%
To Reconstruct	2600	10%	11%	11%	7%	6%
To Rehabilitate	3563	13%	15%	13%	10%	10%
Needs Major repair	3218	12%	14%	11%	9%	10%
Needs Minor repair	11624	44%	42%	43%	49%	44%
Well managed	5268	20%	17%	21%	24%	29%
Total	26651	100%	100%	100%	100%	100%
Functional (Minor repair & well managed)		64%	59%	56%	73%	73%

The rate of decrease in functionality by age does not seem to differ substantially between modalities.

Figure 4: Decreased Functionality by Age



The picture of scheme performance is not much different when one looks at scheme reliability of water availability with months per year and hours per day as indicators. NGOs and Fund Board both perform a bit better than DWSS and DDC-VDC.

Table 26: Scheme Reliability, Annual Number of Months Water Availability

Months	All (No.)	All (%)	DWSS (%)	DDC-VDC	Fund Board (%)	NGO (%)
12	16248	68%	65%	66%	76%	72%
11	752	3%	3%	4%	3%	3%
10	2681	11%	12%	11%	9%	12%
9	1278	5%	6%	5%	3%	4%
8	1216	5%	6%	5%	4%	4%
7	260	1%	1%	1%	1%	1%
6	744	3%	3%	3%	3%	3%
<6	855	4%	4%	5%	2%	1%
Total	24034	100%	100%	100%	100%	100%

Table 27: Scheme Reliability (Hours of water per day)

Hours/day	All (No.)	All (%)	DWSS (%)	DDC-VDC	Fund Board (%)	NGO (%)
24	8267	34%	30%	38%	42%	36%
4-23	13112	55%	57%	51%	50%	57%
<4	2634	11%	13%	11%	8%	7%
Total	24013	100%	100%	100%	100%	100%

The following table checks whether on e or another modality is more suitable for the smaller or the larger schemes, e.g. DWSS for larger and DDC-VDC or NGOs for smaller schemes, but the same patterns are found across all scheme sizes as for the other performance indicators.

Table 28: Population Size, Agency and Functionality Score

	Average Funct. Score	1-50	51-100	101-150	151-200	200-400	401-600	601-800	801-1000	>1000
DWSS	3.33	3.45	3.48	3.55	3.38	2.96	2.74	3.33	3.26	2.96
DDC-VDC	3.49	3.61	3.49	3.28	3.55	3.48	2.52	3.68	3.70	3.86
Fund Board	3.72	3.65	3.82	3.74	3.59	3.38	2.76	3.59	3.43	5.00
NGO	3.76	3.84	3.56	3.90	3.41	3.74	3.59	3.74	4.15	3.67
Overall	3.46									