



# Long Term Sustainability Study (LTSS) Findings

of 298 NEWAH supported WATSAN projects implemented before 1998

*The Long Term Sustainability Study initiated by NEWAH in 2001 has been instrumental in assessing the sustainability of 298 NEWAH supported projects. The intensive study commenced in September 2001 and concluded in March 2005. This issue sheet briefly provides an overview of the study methodology, its key findings related to the status of water points, sources, tanks, community management and maintenance. It also highlights NEWAH's response and recommendations to the key findings and future endeavors.*

## Location of projects studied

Region	No of Projects	
	Hill	Tarai
Eastern	49	29
Central	74	17
Western	78	2
Mid-Western	18	13
Far-Western	9	9
<b>Total</b>	<b>228</b>	<b>70</b>

## Database of all NEWAH projects

*The first stage in the LTSS was to establish a database with key information on all NEWAH projects. The database contains information such as location, implementing partner, technology, number of water points and latrines installed, total project cost etc. The database enables NEWAH to analyse and better understand its past work and is now one of the main tools used for reporting.*

## Context

Safe drinking water and sanitation are prerequisites for a healthy human life. Yet, in Nepal only 82% of the total population have access to safe drinking water and 39% to latrine facility (NLSS, 2003/04). Nepal is a signatory to the Millennium Development Goal targets of halving the proportion of people without water and sanitation by 2015. In Nepal it means that an additional 11,000 households are served with water and 14,000 with sanitation each month between now and 2015. Recent sector financing studies indicate that the volume of resources currently flowing into the sector is insufficient to meet these targets (WaterAid Nepal, 2004).

The 10<sup>th</sup> National Five Year Plan (2002) states that most of the drinking water systems built in the past have become either totally or partially defunct. Profiles of 22 hill districts shows that 76% of schemes built in the past need major repair or rehabilitation (WaterAid Nepal, 2004). Given this scenario sustainability is a major issue.



All photographs : NEWAH

## Why a Long Term Sustainability Study?

By 2001 NEWAH had completed over 400 projects and its programme was expanding each year. NEWAH believed that the projects it supported were sustainable however there was a lack of evidence about this. Against this backdrop, NEWAH with the support of WaterAid Nepal initiated a Long Term Sustainability Study (LTSS) of all NEWAH supported projects completed before 1998.

## Objectives

Main objectives of the study were:

- ① To assess the status of NEWAH supported integrated water, health and sanitation (WHS) projects
- ① To improve the weaker projects and adopt the lessons learnt for future improvement.

## Methods, tools and materials

Teams of 2 to 4 people, comprising of NEWAH staff and external enumerators, made visits to each project. Data collection methods included key informant interviews, village walks, semi-structured interviews, community meetings, observations and focus group discussions. Photographs of every water point were taken; water quality testing and Global Positioning System referencing were carried out in some of the visited projects. Data entry and analysis were made using Microsoft Access programme.

## Project sample for the study

The projects visited in the study were implemented over the course of a 12-year period between 1987 and 1998. Most projects were completed between 1994 and 1998 (68%, 204 projects). At the time of the study visits, some projects were 15 years old and others just 4 years old.

## Technological options in the water supply systems

In the 228 hill (gravity flow) projects, 2,399 water points (taps and spring protection) were visited. A typical gravity flow project consists of a source, either a spring or a stream, where water is collected, through a catchment, into an intake. If required, a sedimentation tank is constructed to clean the water. From the intake water travels to a distribution tank and then to a number of reservoir tanks. Linked to each reservoir tank is a number of tap stands. Because the source and reservoir tanks are located above the water points, gravity causes the water to travel through the system.

In the Tarai the study covered 3,879 water points including 3,816 shallow tube wells, 45 hand dug wells and 18 deep tube wells. (A separate study of NEWAH supported deep tube wells was carried out in 2004.) In a typical Tarai project in the plains shallow tube wells are installed near to clusters of houses to extract ground water with a hand pump. Of the total shallow tube wells installed, 88% were installed by sludging and 12% by the hammering method. At the time of project implementation all tube wells were fitted with Nepal No. 6 hand pumps. During the study the head pumps on 124 water points i.e. 3% of shallow tube wells, were found to have been replaced with local pumps.

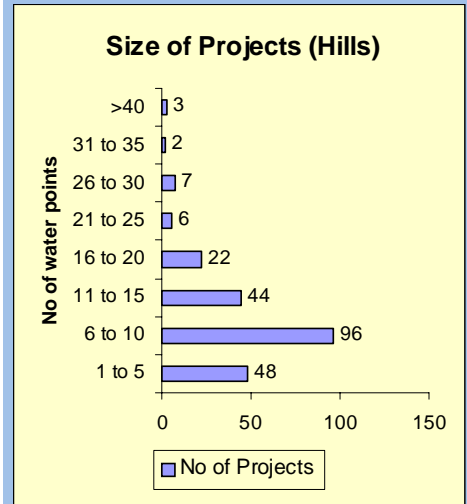
### 15 years old and still going strong - Salyansthana project

The oldest project visited in LTSS was Salyansthana (PN 346), WaterAid's first projects in Nepal, implemented in 1987. This project, located in Kirtipur, consists of a large water tank with three taps. The project is still functioning today and it is a vital water source for the community.

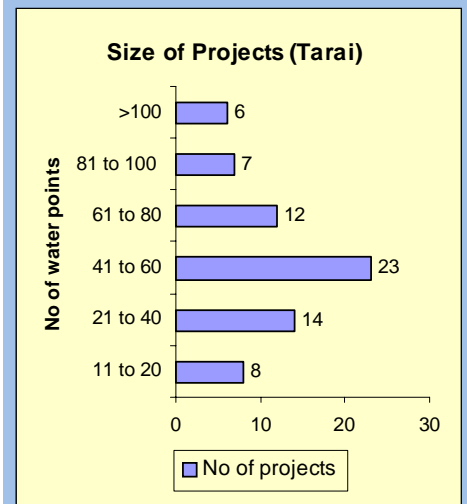


## Size of the projects (in terms of water point numbers)

The number of water points in hill projects ranged from 1 in Salyansthana (Project Number (PN) 346) to 54 in Umling (PN 1033) and averaged 11 water points.



The number of water points in Tarai projects ranged from 10 in Satbariya (PN 34) to 137 in Mahendranagar (PN 11) and averaged 55 water points.



## Main Findings of the Study

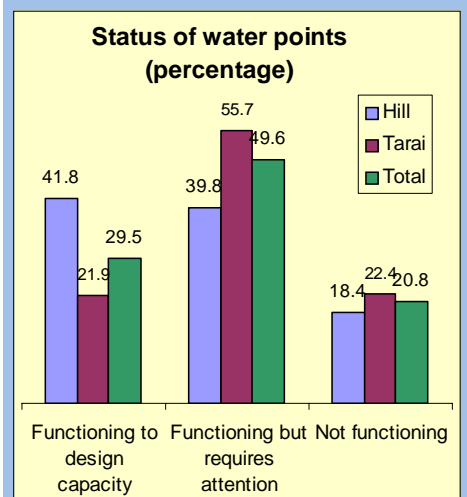
### A. Water Points

#### Status of water points

Of the 6,278 water points visited, 80% were found to be functioning (30% were found to be functioning to design capacity and 50% required attention) while 20% water points were found to be not functioning. In the hill projects the proportion of water points functioning to design capacity was higher than in the Tarai (42% vs 22%) and the proportion of non-functioning water points was lower (18% vs 22%).

The current status of newer projects was better than that of older projects. In hill projects completed after 1995, 57% of water points were found functioning to design capacity compared to 32% in projects completed pre 1995.

The same pattern was found in Tarai projects. The proportion of water points functioning to design was found to be higher in projects completed after 1995 as compared to projects completed pre 1995 (28% vs 19%).



### Problems with water points in Hill water supply systems

Around half the hill water points needing attention required a new faucet, 45% needed repairs to the platform/side wall and 10% had a damaged/missing glove valve. Other problems included drainage, problems with the pipeline and distribution system.

Of the non-functional water points, 25% were found to be out of operation due to problems in the pipeline, 12% due to problems in the source/ intake and 9% due to problems with tanks.

### Problems with water points in Tarai projects

Sixty three percent of the Tarai water points requiring attention had problems with damaged or missing nuts, bolts and pins and around half had damaged or missing platforms. Other frequently occurring problems included damage to the head, head cover, base plate, handle, washer and plunger rod.

Of the non-functional water points the main reasons for break down were damaged washers, lack of spare parts, drainage problems, damage to the top pipe, and poor water quality. Other reasons included disputes, low water table, damage to filters, general lack of maintenance and natural disasters.

### Problems with maintenance of water points

In hill projects the main reported problems regarding maintenance was a lack of unity/interest in the project amongst users, lack of technical knowledge and financial problems. In Tarai projects the greatest problem regarding maintenance was reported as being non-availability of spare parts in the local market and financial problems. Increasing individual household level connections (mostly temporary using flexi pipe) from a tap stand in hill and private tube well installation in Tarai caused low attention to previously installed community water points.

**Response** - NEWAH has changed its approach since the preliminary findings and recommendation of the LTSS. NEWAH Eastern Region Office has started a private tube well improvement programme. Sealing the bore hole of tube wells and casting a platform around it has been undertaken to prevent leakages and water from getting contaminated.

To address the tube well spare part problems in the Tarai, NEWAH has organised information sharing workshops in Siraha and Dhanusha districts trying to create linkage between the users and local suppliers. Posters and leaflets providing information about importance of tubewell maintenance and spare parts availability in these districts have been developed and disseminated. The posters have been produced in local languages.

### B. Sources in Hill Projects

On an average each hill project was found to have 2 sources. Out of the total sources, 87% of sources were spring sources and 13% were stream sources. Additional sources were found to have been added by users in 11% of projects to increase water availability.

### Status of sources

Problems were identified in 70% of intakes. Problems with the intake were more prevalent in stream than in spring sources.



Stream Source in Kathure (PN 1787)

The most common problem with sources was found to be leaks followed by landslide damage/risk, flood damage/risk, and dirty water mixing with the source. Other reported problems included damage to fences, structures, valves/valve boxes and outlet pipes, drying up of sources and missing components (gate valves/air vents/nuts and bolts).



Functioning hill water point



Functioning Tarai water point

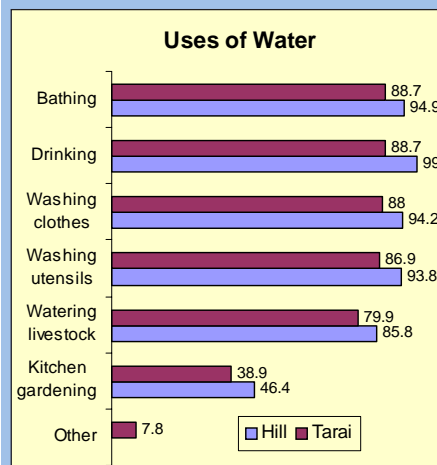
### Uses of water

Water was found to be used for drinking, bathing, washing clothes and utensils at almost all water points. Use of water for watering livestock was common in both the hills and the Tarai (86% vs 80%) and water was used in kitchen gardens in 46% of water points in the hills and 39% of water points in the Tarai.



Children bathing in Amuwa (PN 688)

**Other uses included:** Drinking for pigs, for hostel, fruit production, garden / field, cleaning toilet and classroom & washing vehicles.



In 66% of sources the source yield was reported not to have changed since project implementation. In 25% of sources yield was reported to have decreased and in 5% sources yield was reported to have increased.

Registration is very important to ensure legal ownership and prevent conflicts arising regarding the source. Only one in every ten sources were found to have been registered at the district level under the Water Resources Act 1992.

Disputes regarding the source were reported in only 3% of sources. These disputes were due to certain users capturing the source for irrigation purposes during plantation seasons, disputes with the source owner, inter-village disputes and land dispute.

**Response** - During LTSS visits communities were encouraged to register sources at the District Water Resources Committee. Necessary documents were provided to complete the registration process. NEWAH has also been encouraging the Water and Sanitation Users Committees (WSUCs) to affiliate with the district Federation of Water and Sanitation Users Nepal (FEDWASUN) so as to help them get organised and voice for the right to water. (Refer to response in page 5 for details on FEDWASUN)

## Threats to sources

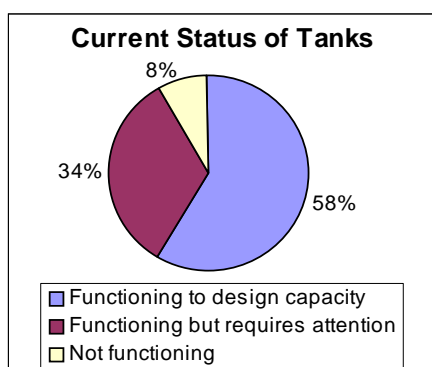
Users reported threats to around one-third of sources. Of the sources under threat, 53% were under threat from landslides and 26% were reported to be in danger from floods. Other reported threats included rain water mixing with the sources, tree roots damaging intakes, sources drying up and road construction.

**Response** - NEWAH is integrating a Community Based Water Resource Management (CWRM) approach to increase the sustainability of sources.

## C. Tanks in hill projects

During the study 993 tanks were visited, an average of 4.4 tanks per project. Types of tanks visited were reservoir, break pressure, sedimentation and distribution. The majority of tanks, 83% were reservoir tanks.

Of the tanks requiring attention, 20% required attention to the manhole cover, 15% were found to be leaking and 14% required attention to the door/fencing around the tank. Other elements requiring attention were valves, inlets/outlets, wash outs and air vents and some tanks were in need of re-plastering and backfilling.



Reservoir tank (RVT) in Bhumlusalle (PN 1457z)

## D. Sanitation

In 2000 NEWAH published a report on the findings of a survey on the status of latrines in NEWAH projects implemented between 1991 and 1995. As this study had been recently undertaken, during LTSS only some data regarding sanitation was collected. The key findings of this study revealed that simple pit latrines were non-durable. They are now no longer promoted by NEWAH.

In hill projects latrine coverage before the project averaged 10%. At the time of the LTSS visits, reported coverage had increased to 58%. In total 61% of the households with latrines reported that the latrines were constructed with NEWAH support.

Latrine coverage in the Tarai projects was reported at 1% before the project and 12% at the time of the LTSS visits. Of the functioning latrines, 33% were reported to have been constructed with NEWAH support.

**Response** - Total sanitation has been promoted by NEWAH in its projects by adopting various approaches such as Community Led Total Sanitation (CLTS), School Led Total Sanitation (SLTS) and SaniMarts.



School latrines in Kharmi (PN 1766z)

## E. Community Management

### Water and Sanitation Users Committees (WSUCs)

A key component of the community management approach is the Water and Sanitation Users Committee (formerly a Project Management Committee). This committee is established during project implementation and normally consists of between 9 to 13 members. The committee is given training on how to operate and maintain the project and ensure its sustainability. WSUCs were reported to have been established in 97% of hill projects and 79% of Tarai projects.



Focus group discussion being held at Saraswoti (PN 1926)

## Effectiveness of Water and Sanitation Users Committees

The number of WSUC meetings held in the previous year was used as an indicator of how active the committees were. In hill projects, 5% of WSUCs reported holding monthly meetings, 40% of WSUCs held at least 1 meeting but around half of WSUCs reported holding no meetings in the last 12 months. Overall, half of hill WSUCs and almost all Tarai WSUCs appeared inactive.

In addition to the WSUCs, water user committees are also established in Tarai projects at each water point. These committees were found to be active at around a quarter of water points and inactive in 75% of water points.

### WSUC involvement in other community development activities

One third of the WSUCs in hill projects were found to have expanded beyond their role of managing the water supply into other areas of community development. In most cases these activities involved the construction of community infrastructure - roads, schools, temples, bridges etc. Other activities included providing loans and running education programmes.

In Tarai projects only 2 WSUCs were found to be involved in such additional activities (school construction and road maintenance).

### Status of water points in projects with active and inactive WSUCs

In hill projects where WSUCs reported holding at least one meeting in the last 12 months, 52% of water points were found to be functioning to design. In projects with inactive WSUCs, 33% of water points were functioning.

In only 4 of the 70 Tarai projects the WSUCs reported to have held a meeting in the last 12 months. However, a similar pattern emerged whereby the proportion of water points functioning to design was higher (36% vs 22%) in projects with active WSUCs.

**Response** - To strengthen and institutionalise the WSUCs, NEWAH and WaterAid Nepal has supported the establishment and development of FEDWASUN at the district and national level. FEDWASUN is a grassroots based water user groups' network which acts as a forum for discussion and advocacy on common issues of drinking water and sanitation.

In all the *Utthan* (upliftment) projects designed in response to the LTSS findings NEWAH has been providing refresher training to the WSUCs on management and institutionalisation.

NEWAH has mainstreamed a Gender and Poverty Sensitive (GAP) approach to enhance and strengthen women's role and ensure equity in the management of WHS projects in communities. NEWAH's policy and log frame has provisions for 50% representation of women in the WSUCs. Women's representation in the WSUCs was reported to be 46% in projects implemented in 2004/2005.



## F. Maintenance

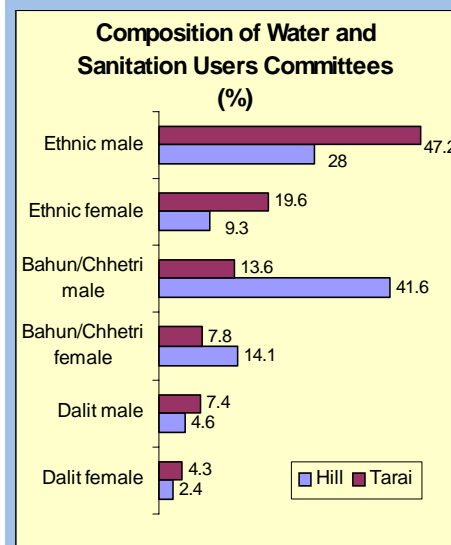
### Caretakers

In each hill project NEWAH trains community people during project implementation to become system caretakers. NEWAH's policy is to train 2-4 people in each project to ensure communities are not reliant on just one person. The caretaker is responsible for system operation and maintenance and this role is vital in ensuring sustainability of the system.

In the hills, caretakers were found in 60% of projects. Out of them 74% were the original caretakers and 26% were new caretakers. The original caretakers were trained by NEWAH during project implementation. Of the new caretakers, 4 were

## Composition of WSUCs

A quarter of members in hill projects and a third of members in Tarai projects were found to be female. In hill projects the majority of WSUC members, (55%) were from Bahun/Chhetri castes and in Tarai projects the majority of members, (67%) were from ethnic groups. Dalits made up 7% of members in hill projects and 12% of members in Tarai projects.



### Caste and gender of people holding main positions in WSUCs

In hill projects, of the four main positions in WSUCs (Chairperson, Vice-chairperson, Treasurer and Secretary) women were found to hold 14% of these positions. In total 69% of these positions were held by Bahun/Chhetri, 28% by Janajatis and 4% by Dalits.

In Tarai projects women were found to hold 22% of these positions, Bahun/Chhetris 68%, Janajatis 27% and Dalits 5%.



Fixing broken pipe line, Purna Dihi (PN 21b)

trained by NEWAH during the project, 4 caretakers were trained by other organisations and 27 were not trained.

In Tarai projects, NEWAH's practice is to train one person as a caretaker for each water point. In the Tarai, 80% of water points were found to have a caretaker, of which 66% were trained by NEWAH and two-thirds were the original caretakers.

For caretakers to be effective they must remain in the community. In hill projects 95% of caretakers were found to remain in the community all the time, 5 caretakers remained in the community only part time and 1 caretaker did not remain in the community. Almost all the caretakers in the Tarai were found to remain in the community.

### Status of water points in projects with and without a caretaker

The status of water points was analysed for projects with and without a caretaker to find out if the presence of a caretaker had any impact on project performance. In hill projects with a caretaker, 50% of water points were found to be functioning to design condition compared to 28% of water points functioning in projects without a caretaker.

In the Tarai, 17% of water points with a caretaker were found not functioning versus 41% of water points without a caretaker.

Overall, in both the hill and Tarai projects, status of water points was found better when a caretaker was present.

**Response** - In all the *Utthan* projects designed in response to the LTSS findings NEWAH has been providing refresher training to the caretakers.

Under the GAP approach NEWAH has facilitated women to acquire paid job opportunities by training them as maintenance caretakers and masons along with men. The potentiality of married women to remain in the community is greater than unmarried girls who are likely to move elsewhere after marriage or men who frequently go to nearby markets or to India seeking better job opportunities.



### Maintenance Funds

During project implementation maintenance funds are established in each project. After project completion, management of these funds is the responsibility of the WSUC. Maintenance funds are necessary to ensure that resources are available in the community to cover the cost of repairs to the water supply system.

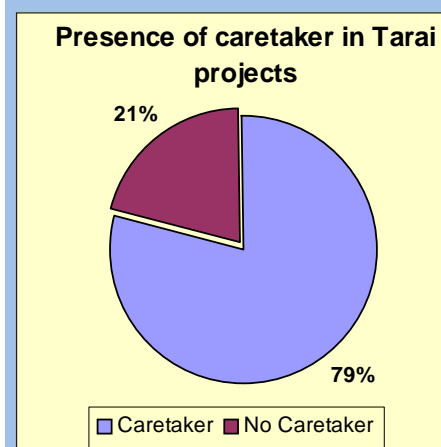
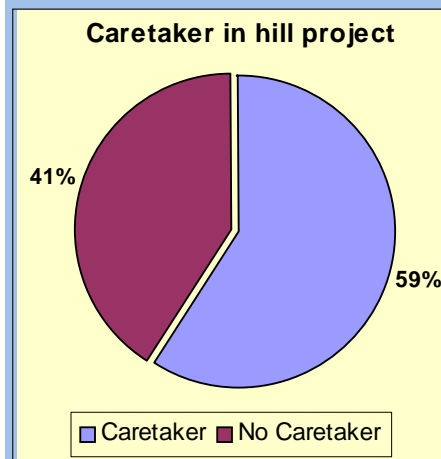
In hill projects the maintenance fund was reported to be deposited in a bank in 60% of projects, invested in 20% of projects and with the WSUC in 14% of projects. In Tarai projects the fund was reported to be deposited in a bank in 40% of projects, with the WSUC in 10% of projects and invested in only 4% of projects. Community members did not know where the fund was in 7% of hill projects and 33% of Tarai projects.

#### Amount in maintenance funds (NRs.)

	Tarai	Hill
Maximum	39,000	2,30,720
Minimum	1,059	290
Average	13,081	19,244
Not known projects	67%	25%

The average size of a maintenance fund in Tarai projects was found to be NRs. 13,081. The average size of a maintenance fund in hill projects was found to be NRs. 19,244. Communities were unable to report the amount of money in maintenance funds in two-thirds

of Tarai projects and a quarter of hill projects, indicating a lack of transparency regarding the maintenance fund, especially in Tarai projects.



Tubewell being repaired, Pharsatikar (PN 1024)



Maintenance work being undertaken in various projects

In many projects many members of the community did not know where the maintenance fund was and how much was in it (see graph opposite).

**Response** - Display boards have been introduced in all NEWAH project areas providing various project information including financial information such as total cost of the project and people's contribution to the project to maintain high level of transparency and accountability of projects among the users and stakeholders to enhance the social auditing functions at the project level.



NEWAH has also piloted Saving & Credit programmes for effective utilisation of O & M funds. The evaluation of the piloted programmes showed positive impact regarding the mobilisation of these funds for various activities.

### Frequency of maintenance fund collection

In hill projects the maintenance fund was collected on a regular basis at around 20% of water points (either monthly or annually), as and when required in 25% of water points and not collected at all in over half the water points. In Tarai projects regular payment was only reported in 0.2% of water points, collection on an as and when required basis was reported in 75% of water points and no collection reported in 20% of water points.

## G. Impacts

### Hill projects

A further study is being planned on the impact of projects on people's lives. However, some information on the impact was collected in the LTSS.

In discussions in hill areas on the positive impacts of projects, the following were reported:

- ◆ availability of safe and clean water supply,
- ◆ increased awareness of health, sanitation and hygiene issues,
- ◆ time saving,
- ◆ time saved used for productive works, such as running small hotels and studying,
- ◆ ability to grow and eat fresh vegetables,
- ◆ money earned from selling the vegetables,
- ◆ and reduction in diseases/illness.

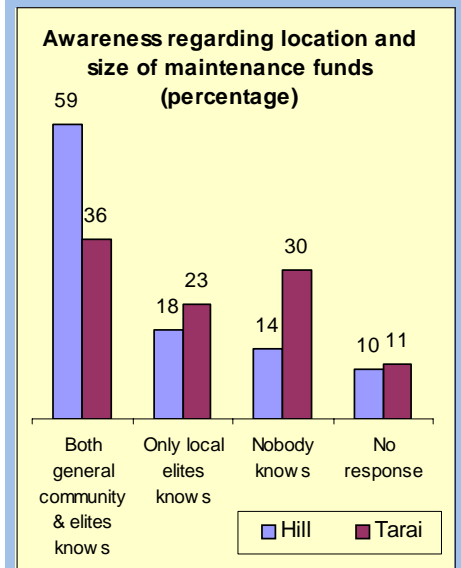
Most hill communities did not report any negative impacts arising from the projects. However, the most frequently reported negative impacts were an increase in flies and mosquitoes as a result of unhygienic direct pit latrines, strained relationships among users and pollution around water points due to poor drainage.

### Tarai projects

In Tarai projects the following were reported as a positive impact in communities:

- ◆ access to safe water,
- ◆ improved health practices/knowledge,
- ◆ improved sanitation and cleaner environment,
- ◆ better relationships in the community,
- ◆ and fresh vegetables/kitchen gardens.

The most commonly reported negative impact of the projects in the Tarai was non-availability of spare parts in 29% of projects, followed by failure of sanitation programmes 19% of projects, conflict over maintenance funds 14% of projects, high iron in the water 9% of projects and pollution from poor drainage 7% of projects.



### Proportion of households' contributions to maintenance funds

All households using the water point were found to contribute to the maintenance fund in around 25% of hill projects and 20% of Tarai projects. In around 60% of projects none of the households were found to contribute.



Availability of safe and clean water supply in Bhumisthan - 4 (PN 031')



Improved hand washing practices, Supauli (PN 1023)



Vegetable garden maintained in Beluwa (PN 1455)

## Response to LTSS findings

### Utthan

One of the LTSS objectives was to identify and then support weak projects. An *Utthan* programme was designed to meet this objective. In this programme, each year a small number of projects in need of support are prioritised using the LTSS database. Projects where a high proportion of water points are not functioning, with repair beyond the capacity of the community and where latrine coverage is low are prioritised. The approach adopted is based on the principle of participatory problem solving. Strengthening of community institutions is given priority. *Utthan* aims to enhance project sustainability long into the future.



*Utthan project in Maipokhari (PN 1031)*

## Conclusion

The three and half years' intensive study generated much learning for NEWAH. The community management approach and technologies used in hill (gravity fed) projects have been found largely appropriate. However, during the life of a project a community faces challenges, which it is not always able to tackle alone. In the vast majority of cases local government has been unable to provide this support and the latest government Draft Rehabilitation Policy (2003) clearly states that rehabilitation is the responsibility of the implementing organisation. If the water



supply systems are to continue to serve communities to the end of their design life, and beyond, some sort of backup is required. Long Term Sustainability type of studies followed by a targeted support programme, such as *Utthan*, can provide a cost effective way of providing this support.

The community management approach in Tarai tube well projects has been largely based on the hill model. The study shows that this model, consisting of a large project area, single WSUC, a central maintenance fund and regular fund collection is neither appropriate nor sustainable in the Tarai environment. These findings are leading NEWAH to experiment with new innovative approaches to sustaining community institutions in the Tarai.

The LTSS provided staff a unique opportunity to revisit their work and that of their peers and reflect on their practices. This cycle of observation – reflection and innovation has been successful in stimulating NEWAH to become a more feedback responsive and self-critical organization resulting in better quality service delivery work along with greater learning and knowledge sharing opportunities in the sector.

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A detailed report and interactive CD is available

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Prepared and designed by: Information and Knowledge Management Unit

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## Issues

The following issues have been identified for which detailed recommendations are made in the main report.

### Water

- ◆ Platforms cracking in Tarai projects
- ◆ Holes in GI pipes in Tarai projects
- ◆ Nepal No. 6 pump spare parts supply chain problems
- ◆ Problems at water sources
- ◆ Lime encrustation problems
- ◆ Problems of poor water quality
- ◆ Appropriate technical design and drawing options for intake construction limited

### Sanitation

- ◆ How to increase sanitation coverage?

### Maintenance

- ◆ Irregular maintenance fund collection
- ◆ Problems in continuity and quality of caretaker's work
- ◆ Need for meaningful maintenance follow up visits

### Community Management

- ◆ Limited capacity of WSUCs and need for their institutionalisation
- ◆ Weak coordination and linkages between WSUC and local bodies

## Major Recommendations

*During consultations with NEWAH regional staff, the following recommendations were drawn up. Some have already been incorporated into new projects; others need further discussion and planning before integrating into regular operations.*

*The overall recommendation provided by the study were as follows:*

- ◆ Improve the quality of project surveys and baseline data collection survey
- ◆ Increase the level of technical supervision during implementation
- ◆ Review monitoring systems to ensure adequate supervision of construction work and quality control of materials
- ◆ Look for different options /approaches for Tarai projects