C9

UN-HABITAT

A Report on Sanitation Improvement Activities

Siddhipur Integrated Water and Sanitation Programme

ENPHO
Creating Eco Societies

Environment & Public Health Organization (ENPHO)

March 2007

Table of Contents

List of Tables

1 Background

Siddhipur is a traditional Newar settlement located approximately 6 km southeast of Kathmandu. It has a population of 6046 is 1308 households. Water and sanitation is one of the most serious problems of this community, where 52 public stand posts supply untreated water and most households do not have access to proper sanitation. Under UN-Habitat's Water for Asian Cities Programme in Nepal, ENPHO is assisting the Siddhipur Water and Sanitation Users Committee to implement a fast track, community based water and sanitation programme. The major objectives of the programme are the following:

- Demonstrate how a community-based water and sanitation programme can be implemented
- Demonstrate the application of pro-poor connection charges and tariffs
- Increase community awareness on environmental sanitation
- Create job opportunities for the poorest of the poor group
- Enhance capacity of the local authority, WATSAN User's Committee and the community

The programme has five different components, which includes the following:

A. Socio-Economic and Technical Assessment
B. Water Supply Improvement activities
C. Sanitation Improvement
D. Solid Waste Management
E. Capacity Building and Awareness Activities

This report provides details of the progresses achieved till date, the strategy and approaches undertaken to improve the sanitation situation in Siddhipur.

2 Baseline Sanitation conditions

Socio-economic survey conducted under the Siddhipur Integrated Water and Sanitation Programme showed that about 72% of the households in Siddhipur have access to toilet facilities. There were six main areas used for open defaecation out of which four were used only by the women members. Similarly, open defecation practices were found to be common in the settlement. Even those households having access to toilet facilities went for open defecation. The main reason for many people not using their toilets was due to the fear of quick filling of the septic tanks or pits. About 41% households were practicing open defecation of which majority of them was women and old people.

The major types of toilets used in Siddhipur were i) Cistern flush toilet, ii) Pour flush toilet, iii) Ecosan and iv) Pit latrines. Majority of the households (66.1%) were using pour flush toilets with septic tanks (Table1). Septic tanks were usually found to be built without adequate engineering designs resulting into frequent overflow and/or leaking causing environmental health hazard and groundwater contamination. In addition, sludge from septic tanks requires regular emptying but such cleaning services were either inaccessible or unaffordable to most of the inhabitants of Siddhipur. The survey showed that there were more than 500 septic tanks in the settlement. These septic tanks were cleaned manually and its contents were either

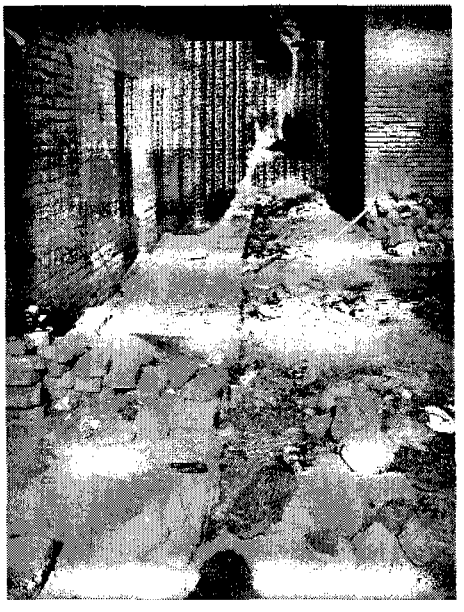
used in the agricultural fields or dumped into nearby rivers posing potential health risk.

Table 1: Distribution of toilet facilities in Sidhhipur

Type of toilet	Household (%)	House (%)	Number of toilet	Population (%)
Toilet with cistern flush	1.5	1.8	29	1.6
Toilet with pour flush	66.1	65.8	799	68.9
Ecosan	2.9	3.0	34	2.9
Pit latrine	1.4	1.6	18	1.5
Total	71.9	72.2	880	74.8
Number	941	824		4,524
Open defecation	40.8	36.3		39.9

One of the major causes of unsanitary situation in Siddhipur was due to the poor drainage system. Though there was a drainage network, most of them were not functioning well due to solid waste clogging problems especially plastics and straw. In addition, due to lack of regular maintenance drains fell apart and were in need of improvement. In many areas, there were no drains. In the absence of drains, wastewater from households was disposed haphazardly creating unhygienic conditions.

Picture 1: Poor sanitation conditions



Picture 2: Poor drainage in Siddhipur

Similarly, the solid waste management was another major sanitation problem in Siddhipur. Waste such as plastic, papers and straw waste generated from the traditional straw weaving practice was found to be haphazardly disposed in the area creating unhygienic conditions.

3 Strategy for sanitation improvement

Realizing the sanitation problems of Siddhipur, various sanitation improvement activities were devised in close consultation with the Siddhipur water and sanitation users committee (WSUC) and the community. Sanitation improvement activities focused on different activities as provided below. In addition, as it was equally important to address the problem of solid waste management a separate SWM strategy was developed in Siddhipur (please refer to SWM report).

3.1 Promotion of ECOSAN toilets

Increasing access to toilet facilities was one of the primary objectives for sanitation improvement in Siddhipur. For this the project planned to promote eco-friendly, urine diversion Ecosan toilets. The ECOSAN toilets are different from ordinary toilets where water use is minimal or negligible with minimal or no release of wastewater. Thus, this was taken as an appropriate technology for areas or communities without sewerage and the necessary treatment facilities. Here, urine and faeces are separated at source, excreta are sanitized prior to recovery and reuse. Urine is utilized as fertilizer and faeces as soil conditioner.

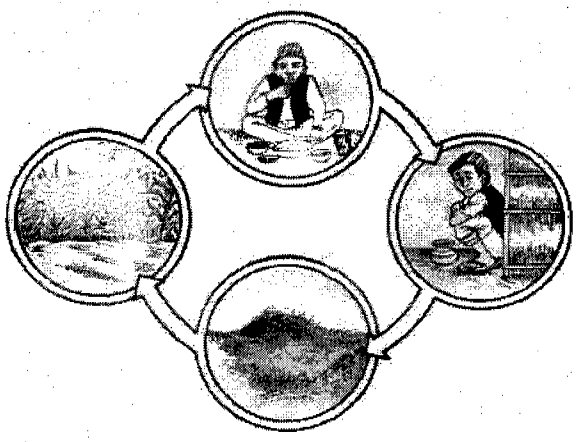


Figure 1: Closing the nutrient loop

Thus, human waste is reused and the nutrients are recycled back into the soil, forming a closed loop system as opposed to the conventional system where the nutrients are wasted and not returned to the soils (Figure I). Ecosan toilet was found to be suitable options in Siddhipur as majority of the inhabitants are farmers. Since decades people of this community have been using night soil as fertilizers. The programme targeted to construct around 100 ecological sanitation toilets. The estimated cost of an Ecosan toilet is around Rs 16000 to 17,000 where the sub structure (up to the pan level) costs around 10000. The sub structure comprises of squatting pans and feaces storage chambers. The superstructure which consists of the side walls and the roof costs around Rs. 6000.

The following approaches were used to promote Ecosan in Siddhipur:

- Increase awareness to create demand for toilets through mobilization of the WSUC, local CBOs and informal groups
- Construct Ecosan at households with priority to the poor and who do not have access to toilet facilities
- Demonstrate new designs of Ecosan toilets in houses which do not have space or limited space for construction outdoors
- Demonstrate and design cheaper version of Ecosan toilets
- Conduct house to house visits and group trainings to provide knowledge on use of toilets, urine and sanitized feaces

3.2 Promotion of Improved Pit Latrines

To increase the sanitation coverage in Sidhhipur the programme also promoted other type of onsite systems such as improved pit latrines and septic tanks at the household level. The pit latrines were cheaper in costs compared to the Ecosan toilets. The pit latrines were promoted in areas where construction of Ecosan toilets was not feasible on hand, while on the other hand considering the fact that a fecal sludge collection system would be in place in Sidhhipur households having pit latrines can easily take fecal sludge cleaning services at an affordable price once the pits are filled up. Keeping in mind of the ground water table the pit latrines were promoted only in areas where the ground water table was low and where there were no dug wells in the vicinity.

3.3 Introduction of Communal Septic Tanks

Construction of community scale septic tanks was another strategy for increasing access to toilet facilities. The main approach was to promote well-designed septic tanks in areas where construction of either Ecosan or other individual toilets was not feasible due to space limitation. In addition, this type septic tank would also address the problem of quick filling of tanks due to ground water intrusion. The communal septic tanks would serve a minimum of five to a maximum of ten households. Courtyards or a lane in front of the clustered houses was proposed for construction of septic tanks. At least one to two communal septic tanks would be constructed in Sidhhipur as a demonstration.

3.4 Drainage construction, rehabilitation and pavement

To improve the storm water drainage in Sidhhipur around 400m of new drainage line and around 750m of existing drains was proposed for improvement through active community participation. The improvement work would focus on site clearance works such as removal of debris and blockages, covering of the drains with concrete slab. Similarly, along with drainage improvement, brick pavement in very unhygienic areas was also proposed. As per the assessment, 1100 square meter of pavement work was required in different locations. Similarly, the programme proposed to carry out additional pavement and drainage works in other areas based on the demand and willingness from the community during the implementation phase.

3.5 Fecal Sludge Management

In order to provide FS collection facility to the people in the community, the programme purposed to establish a faecal sludge management system. The following activities was to be carried out for FSM

- In consultation with the local WSUC and the local community a local entrepreneur from the poor group of the community will be selected and will be strengthened to provide FS collection services in the community.
- The programme will procure a FS collection vehicle (see picture 3) and hand it over to the Sidhhipur WSUC. In turn the WSUC will lease the vehicle to the local entrepreneur and also make sure that the FS collections prices are provided at affordable prices to the locals in the area.

- A coordination mechanism will be established between the entrepreneur and the public owned Guheshwori Wastewater Treatment Plant (GWTP) in Kathmandu for FS treatment and disposal.

- An operational manual for FS management will be prepared in consultation with the community for the operation of the FS system. This will be used as a guideline for operation.

- The local entrepreneur will provide FS collection services in Sidhhipur and other adjoining Village Development Committee (VDC). It is expected that the sludge collection facility will benefit more than 10,000 people in these areas.

Picture 3: Proposed FS collection vehicle

3.6 *Water and Sanitation Education and Awareness activities*

To bring about behavioral change among the inhabitants of Sidhhipur on sanitation practices the programme also focuses to carry out various trainings, awareness and campaigns focusing on water and sanitation issues. As part of the WATSAN education, the programme proposed to carry out school level and community level activities.

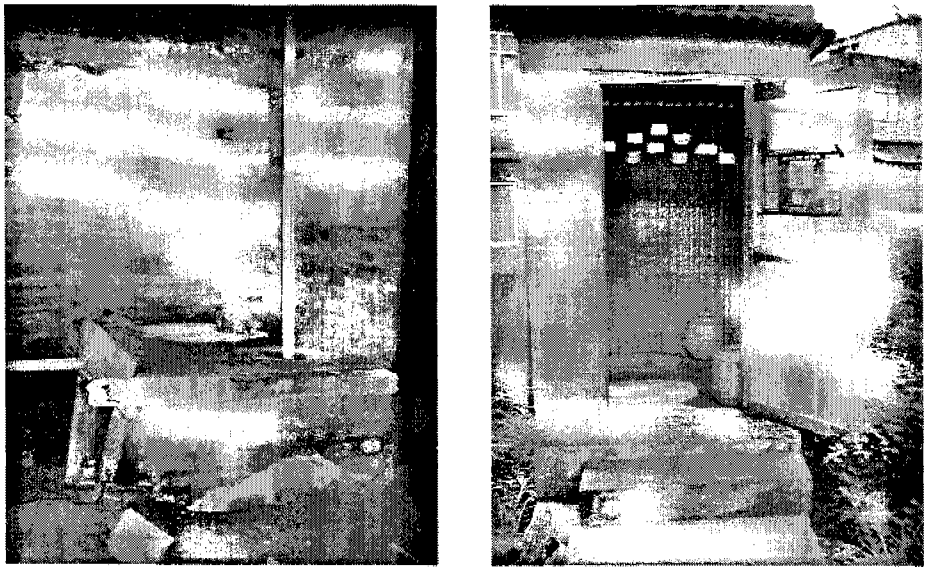
4 Progress and outcomes of sanitation interventions

Under the sanitation, improvement activities the following achievements have been made so far:

4.1 Increased sanitation coverage

Different technologies and approaches were followed to increase the sanitation coverage in Siddhipur. The programme was successful in increasing the sanitation coverage to over 90% during the programme duration. More than 230 households i.e. around 1050 people have been directly benefited through toilet facilities from the programme. Similarly, many households after motivation have constructed toilets on their own initiatives. Table 2 shows different types of sanitation systems constructed in Siddhipur.

As per the sanitation strategy the top priority was to promote Ecosan toilets in Sidhhipur. The programme was successful in promoting over 70 Ecosan toilets. Since Siddhipur has a dense clusters of houses in the core area, construction of toilets was not easy due to space limitations in these households. To address this constrain, the programme demonstrated four indoor type Ecosan toilets (Picture 4) in households having very limited space.



Picture 4: Ecosan indoors and outdoors

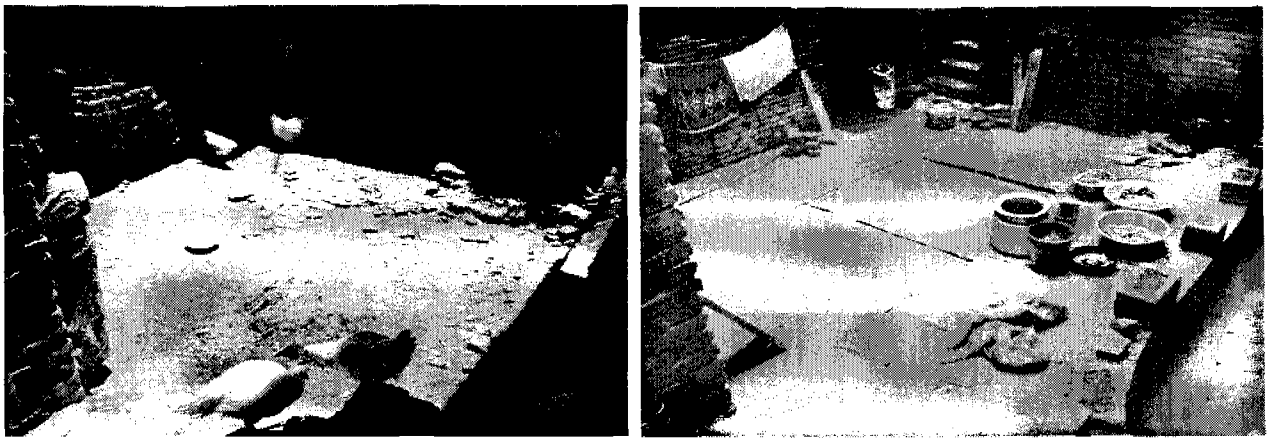
Through these demonstrations it was expected that there would be additional demand for such toilets. However, the demand was not too high. Hence to cater the needs of those households with space constrains for toilet construction, the programme introduced an alternative option of improved pit latrines. These types of toilets have been constructed at the basement of the households and require minimum space. The feaces holding tank comprises of a tanks made up of concrete rings which are locally available. The feaces or feacal sludge has to be emptied at intervals once it is filled up. A total of 140 improved pit latrines have been constructed in Sidhhipur.

Table 2: Type of sanitation systems constructed in Siddhipur

SN	Type of System	No of units constructed	No of Households benefited	Support from Programme	Household contribution
1	Ecosan Toilets	70	70	Supported construction up to Pan level/sub structure (approx. NRs.10,000)	Constructed the super structure (approx. NRs. 6000)
2	Toilets with Septic Tanks	15	15	Provided construction materials worth Rs. 4000 for Septic Tank	Provided unskilled labour & constructed individual toilets
3	Communal Septic Tanks	1	4	Supported construction of Septic Tank shared by 5 households	Provided unskilled labour & constructed individual toilets
4	Improved Pit Latrines	140	140	Provided 5 rings and a cover slab	Provided unskilled labour & constructed individual toilets
	Total:	**226**	**229**		

4.2 Introduction of Communal Septic Tank

In households where neither Ecosan toilets nor individual septic tanks were feasible, the programme introduced communal septic tank. A communal septic tank was successfully introduced in Yangal of Siddhipur. The septic tank has been in operation for almost 4 months now (please see picture 5) and is currently being shared by 4 households. The programme provided raw materials for the construction whereas individual households contributed by providing unskilled labour and constructing their own toilets. The introduction of communal septic tanks has been innovative and is probably the first of its kind in the country.



Picture 5: Site before and after construction of Communal Septic Tank

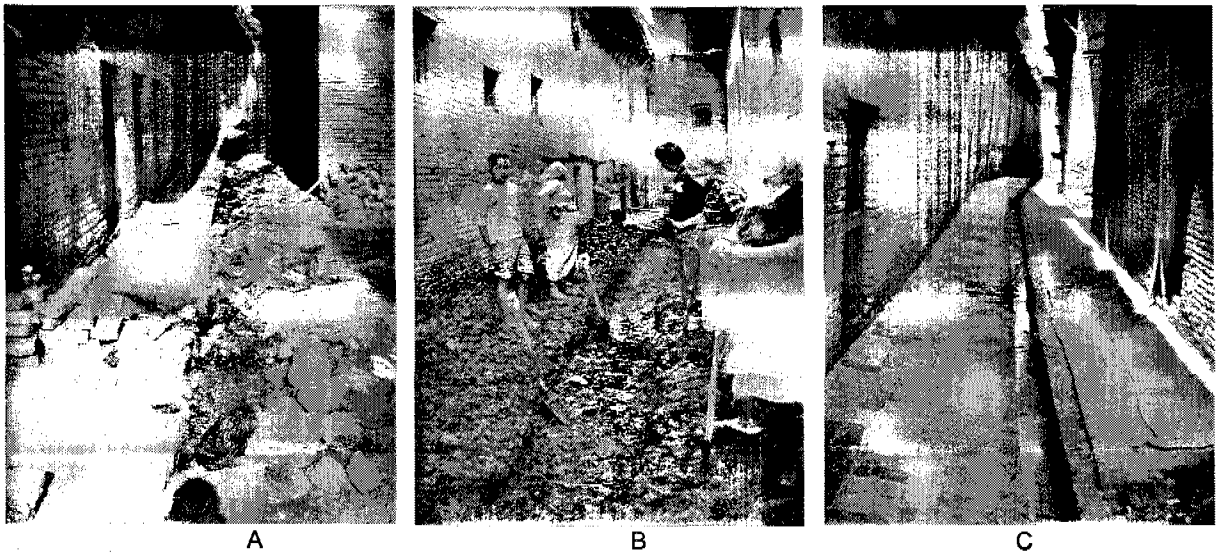
4.3 *Improved storm water drainage and pavement*

The storm water drainage activity was carried out in two phases. During the first phase i.e. end of June 2006 around 500m of drainage was improved through construction of new drainage and rehabilitation. During the second phase additional 135m of drainage was constructed. Table 2 provides a list of areas where drainage improvement works were carried out. During the drainage improvement programme, there was overwhelming community participation and support in respective areas. The programme provided raw materials such as cement and aggregates in areas where drainage needed rehabilitation. The remaining work such as construction of drainage cover/slab, site clearance etc. were contributed households under the technical supervision from ENPHO. Please see Annex II for pictures of the activities.

Table 3: Drainage improvement work in Sidhhipur

SN	Location	Length (meters)	Type of work
1	Nhuphalcha to Ram Dhoka	100	New construction
2	Ram Dhoka to Pipalbot corner	42	New construction
3	Pipalbot corner to Khasi corner	15	New construction
4	Khasi corner – VDC	42	Rehabilitation
5	VDC – Tadhanani	35	Rehabilitation
6	Ramdhoka – Dhasi	55	Rehabilitation
7	Dhasi – Hanasima	136	Rehabilitation
8	Dhasi– Chauni Gachhe	52	Rehabilitation
9	Gache Tole	40	New construction
10	Ram Dhoka Gali	40	New construction
11	Pinani	25	Rehabilitation
12	Gache Gali	70	New construction
	Total Length	**652 m**	

Similarly, more than 1100 square meters of pavement work was carried out in areas where sanitation situation was very poor. Around 160 sq. m of pavement work as well as drainage improvement activity was carried out at the *Ramdhoka Galli* (alley). This site originally had a very poor sanitation situation due to poor drainage, dumping of solid waste from households.



A B C

Picture 6: Pavement and Drainage work at Ramdhoka Galli

A: Situation before in Ramdhoka Galli,
B: Local women participating to construct drainage and pavement
C: Situation after in Ramdhoka Galli

With the pavement and drainage work in place now the sanitation situation has improve significantly. Picture 6 shows a comparison of the before and after situation at Ramdhoka.

Likewise additional 1000 square feet of pavement work were carried out in Tadhanani and Devnani Chowk which are the main square of the village. After the pavement works the main squares have become much cleaner and have served as a multi purpose center. For example for women living around this square it has provided clean space for weaving straw mats, children and adults use this facility as a playground and the communities are using this improved space to perform various rituals and programmes.

4.4 Fecal Sludge Management Plan developed

In order to provide feacal sludge (FS) cleaning facilities in Siddhipur the programme has developed a draft plan for fecal sludge management. As per the plan the following activities will be conducted:

- Formation of a sub committee under the Sidhhipur WSUC
- Preparation of lease contract agreement between private entrepreneur and WSUC
- Selection of a private entrepreneur and assistants for providing FSM services
- Capacity building of the private entrepreneur
- Arrangement of sludge disposal and treatment with Gujeshwori wastewater treatment plant
- Purchase of a suction vehicle and accessories
- Operation of FS cleaning services by entrepreneur in Sidhhipur
- Regular monitoring and feedback by WSUC and ENPHO
- Improvement of FS cleaning services

As per the plan most of the activities have been accomplished. However, due to budget constrains, the purchase of FS collection vehicle has been withheld for the time being. With availability sufficient funds the vehicle will be purchased and will come into operation.

4.5 WATSAN Education and Awareness Programmes conducted

To educate the people of the community on water and sanitation issues the programme organized several training activities mainly focusing the school children and women members of Sidhhipur. The following activities were conducted:

4.5.1 School level Value Based WATSAN Education

The following activities were accomplished under the School Programme:

- Establishment of five Nature Clubs in Sidhhipur at Shree Sidhimangal Higher Secondary School, Ananta English School and Kopila English School, Mt. Olive English Barding School and Nawa Kunja English School.

- Conducted a three day capacity building training camp to impart knowledge on club management, team work building and to provide necessary skills to the members of the newly formed nature clubs. The programme was conducted at ENPHO field Office from 2nd to 4th January, 2006. A total of 33 students participated in the training camp.

Picture 7: Team building exercise while Nature Club Students receive TOT

- Nature Clubs on their own initiatives launched several small activities within the school premises such as clean up programs, dustbin competitions, wall magazines and other small activities.

- Conducted life skill based value based water and sanitation education classes in five schools through the nature clubs. The VBWE manual developed by UN-Habitat in association with partners was taken as a reference material. More than 250 students benefited through the life skill based education programme which was conducted over a 3 months period.

Picture 8: School children participating in poster competition

- Conducted Wall Magazine Training Workshop for student of the nature clubs

- Conducted inter school Wall magazine and poster competitions

Picture 7: Children learnt about composting technology established in their own village

4.5.2 WATSAN Education through Adult Literacy Classes

To provide water and sanitation education to the local community Adult literacy classes were conducted in Sidhhipur. Initially six local women from Sidhhipur received a Training of Trainers (TOT) on non formal education from 19-21 March 2006 following which these trainers then conducted non formal education classes in Sidhhipur from April to June 2006. Initially 5 parallel evening classes, of 15 to 20 members in each group, were conducted. However, during the paddy plantation season in June the number of participants decrease and the group size had to be reduced to 4 groups. The program was successful in disseminating various issues on water and sanitation and about the programme activities. More than 80 local Adult women benefited from the non formal education programme.

4.5.3 Community Level Awareness Programmes

4.5.3.1 Mass awareness programmes

Sithi Nakha is the traditional festival of the local inhabitant *(the Newars)* of Kathmnadu Valley during which traditional wells and ponds are cleaned. To mark this festival and also to raise awareness on water and sanitation issues in Sidhhipur a 2 day long Sithi Nakha festival was organized in Sidhhipur on 1st and 2nd June 2006. More than 500 locals including school children and local men and women participated during the festival. During the occasion, the programme organized an exhibition to update on the various activities that had been conducted in the community. The festival was well received by the locals of Sidhhipur.

Picture 8: Member of the WSUC informing locals about programme activities

4.5.3.2 Publication of Wall Magazines

In order disseminate information to the public, the integrated programme also published wall magazine comprising of different progress update and articles and the programme activities in Sidhhipur. The magazine was published on the occasion of Sithi Nakha and was placed in various strategic locations in the village where people were able to read it

Picture 9: Wall Magazine published by WSUC

4.5.3.3 Street Dramas

Street dramas were organized in the community involving local children and women. The main aim of these shows were to create awareness among the community members to adopt better sanitation and hygiene practices both at the personal and at the community level. Similarly, street rallies were also organized to create awareness on proper disposal of solid waste and to construct toilets at the household level.

Picture 10: Street Drama being performed by local children

4.5.3.4 Clean up programmes

Several clean up programme were organized in Sidhhipur on various occasions. This was mainly done to develop the habit among the community members to clean their surroundings frequently and develop better sanitation practices.

Picture 11: Children participating in the clean up programmes

4.5.4 Community Led Total Sanitation (CLTS) Campaign

The CLTS approach is based on the assumption that community has the strength and willingness to overcome their own water and sanitation problems. It recognizes that outsiders may be needed to help the community identify their current situation and the need for improvement. The members of the community are motivated to solve sanitation problems within themselves using different local tools (Table 4) and techniques. The role of the NGO is mainly of a facilitator enabling communities to analyze their situation, identify areas of improvement, develop participatory action plan for improvement and then implement these plans. The main objectives of CLTS in Sidhhipur were the following:

- To achieve 100 % coverage of latrine use in the area
- Enhance solid waste management of each household of the area
- Enhance personal, household and environmental hygiene of the area

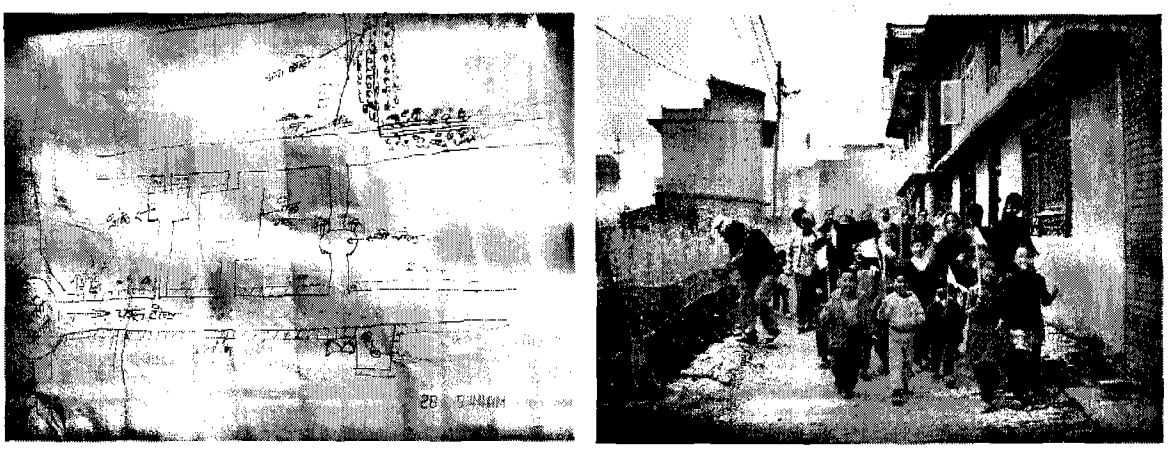
- Raise the feeling of ownership of the programme to the community
- Maintain sustainability of water, hygiene and sanitation facility.

Table 4: Ignition PRA tools used in CLTS approach

Tools	Purpose	Action
Transect walk	To observe the current and build rapport with the community	Women, children, men walk in the community and identifies area with poor sanitation situation
Flagging	To identify areas where open defecation practices prevail	Women, children, men places flags in area where there is open defecation and identifies households practicing open defecation
Social Mapping	To establish number of households, population, toilets and water points and to know their surroundings	In groups the locals draws social maps of the area where there are living
Feaces Mapping	People are visually made aware of the different open defecation areas	Women, children participate and draw a local map of the area, locates the different open defecation areas
Feaces calculation and cause/effect analysis	To identify the effects of current open defecation practices and how much feaces can enter one's mouth due to open defecation	The amount of feaces entering a person's mouth is calculated in a group discussion.

The CLTS programme has been initiated in 12 different clusters of Sidhhipur and has been very successful. The following are some of the outcomes of the CLTS campaign:

- Sanitation committee established in 12 clusters of Siddhipur
- Area looks cleaner than before
- Reduction in open defecation practices.
- Clean up programmes conducted every Saturday morning by locals themselves.
- Plastic waste collected in metal hooks by almost every household.
- Households motivated to construct toilets. More than 100 toilets were constructed as a result of CLTS campaign
- Increased awareness on sanitation and hygienic practices.
- Three children clubs also established and mobilized



A B

Picture 12: CLTS activities in Sidhhipur

A. Feaces map prepared by community
B. Children shouting slogans to free open defecation

4.6 Beneficiaries from Sanitation Improvement:

Table 5 provides the list of beneficiaries of different sanitation improvement activities in Sidhhipur. It is found that more than 2500 people have been benefited through different sanitation improvement activities. Similarly, a equal number of people have been educated on water, sanitation and hygiene issues through adult literacy classes and CLTS campaigns under the Sidhhipur Integrated WATSAN Programme.

Table 5: Beneficiaries from sanitation improvment

SN	Sanitation Activities	Number of beneficiaries (HHs)	Total
	Infrastructure development		
1	Ecosan Toilets	70	322
2	Household Septic Tanks	15	69
3	Communal Septic Tanks	5	20
4	Improved Pit Latrines	140	644
5	Drainage Improvement work	211	976
6	Pavement work	105	496
		Sub total:	**2527**
	Trainings and orientations		
7	Value Based WATSAN Education	5 schools	250
8	WATSAN Adult Literacy classes	4 women's group	80
9	Community Led Total Sanitation Campaign	12 clusters	2566
		Sub total:	