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**Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality**

PROGRESS REPORT

- A. Promotion of water and environmental sanitation practices in Tigni**
- B. Preparation of comprehensive waste water management plan**



Submitted to



Water for Asian Cities Programme
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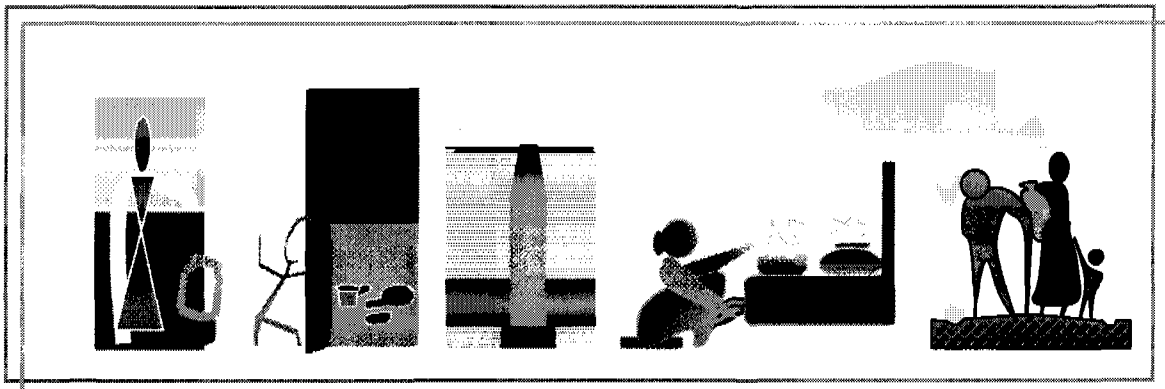
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THE PROJECT

Background

This project has two major components, viz. water and environmental sanitation improvement of the peri-urban poor settlement Tigni and waste water management plan of Madhyapur Thimi Municipality.

A. Promotion of water and environmental sanitation practices in Tigni

Tigni, the low income settlement of Madhyapur Thimi Municipality is one of the poorest settlements of Kathmandu Valley identified by recent study on slums and squatter settlements in Kathmandu Valley. A collaborative initiative of CIUD with UNHABITAT started a detail study of the area under poverty mapping and water & environmental sanitation improvement plan preparation in 2005. Based on the findings of the initiative, CIUD is implementing water and environmental sanitation improvement activities with the support of UNHABITAT. Water Aid Nepal one of the funding partners of CIUD is also providing support to the activities. CIUD in collaboration with Madhyapur Thimi Municipality and partnership with the local community is implementing the water and sanitation improvement activities as identified in the Water and Environmental Sanitation Improvement Plan.

In order to pursue the MDG target 10 of reducing the population of people without sustainable access to safe drinking water and basic sanitation to half by 2015, UN-HABITAT under WAC is developing approaches for making interventions at city/local levels, to extend coverage to unserved households with higher levels of sustainability. It is, therefore, promoting pro-poor water and sanitation governance policies and programmes both at local, sub-national and national levels.

The population of this isolated slum settlement of one of the backward communities in Kathmandu is 809 with 146 households. Taking the yardstick of US\$ 1 income per capita per day, it was found that **88.4%** of the population is under the poverty line. The water and sanitation

condition of the area is found to be very poor. The plan has identified all the activities that require immediate attention as well as long term activities. In this project, the immediate activities are considered which includes improvement in water availability, storm water management, grey water management, neighbourhood environment improvement, indoor environment improvement, and building the capacity of the local communities for the sustainable development. These initiations are guided by gender balance and sustainable environmental considerations. Details of the activities are presented in Water and Environmental Sanitation Improvement Plan of Tigni.

B. Preparation of comprehensive waste water management plan

The second part of the project is waste water management plan for Madhyapur Thimi Municipality. Waste water management is one of the challenging jobs for local governments in developing countries. Because of the volume of waste water produced and the cost of management, most of the cities are discharging their raw sewage in natural water bodies. This has not only brought ecological imbalance in the water bodies, but provided a better habitat for the vectors of diseases. Residing on the marginal land, urban poor are the direct victims of the situation.

As decentralization is rather new in this country, municipalities in Nepal are weak in resources and young in governance. The 22 municipalities added in 1997 are striving for delivering the urban services in their young cities. There are still two parallel central government institutions functioning with the authorities to address water and waste water management in the cities of Nepal. Although, the Local Self-governance Act (1999) has devolved these responsibilities to the municipalities, the duplication still exists. However, none of the institutions are addressing the issue to an acceptable level. Municipalities, being the late comers in the business, are trying to address the demand of waste water management with its capacity possible. The weak institutional capabilities: both in terms of finance as well as human resources; are the major limitations. Moreover, low political priority is yet another reason for poor management of waste water. In the absence of waste water management policies, present management practices are contradictory

and confusing. Therefore, a well elaborated policies and strategies are in need in all the municipalities in Nepal.

Madhyapur Thimi Municipality (MTM) was established in 1997. Being a young municipality, it is striving for delivering better urban services to its fast growing population. Among other areas, there is a need for capacity building of the municipality in waste water management. In the absence of overall picture of the situation and guiding plans to implement and enforce; municipalities are investing on waste water projects which in return is sifting the problems to downstream settlements and to the future. In this context, the emergent municipalities like Madhyapur Thimi can set examples for other urban centres in waste water management planning.

In order to pursue the MDG target 10 of reducing the population of people without sustainable access to safe drinking water and basic sanitation to half by 2015, UN-HABITAT under WAC is developing approaches for making interventions at city/local levels, to extend coverage to unserved households with higher levels of sustainability. It is, therefore, promoting pro-poor water and sanitation governance policies and programmes both at local, sub-national and national levels.

Among the four major objectives of Water for Asian Cities Programme, this initiative comes under **integrated urban environmental sanitation** where the priorities include development of appropriate technical options; promoting public private NGO partnerships for scaling up sanitation facilities; and development of innovative financial mechanisms for mobilization of local funds for sanitation service. Moreover, addressing the issue through strengthened local governance for the sustainability is also considered under this activity.

The main objective of this initiative is to enhance capacity of emerging municipalities in adopting integrated urban environmental sanitation practices through comprehensive waste water management plan, taking Madhyapur Thimi Municipality as an example.

Proposed activities

Following are the proposed activities under the two major components of this project:

Activities	Outputs
A. Promotion of water and environmental sanitation practices in Tigni	
<p>1. Improvement in water delivery Improve the availability of quality water to the settlement. This activity will include</p> <ol style="list-style-type: none"> Addition of three community water taps Installation of tube well in the existing well to lift the water Build awareness on impacts and mitigation measures on high dose of chlorine and use of spring water sources 	<ol style="list-style-type: none"> Three community tap installed A tube well lifting water from existing well is installed Awareness build on communities on water quality.
<p>2. Improvement in storm water and grey water management This activity will include</p> <ol style="list-style-type: none"> Circular RCC drain constructed to channel storm water to discharge point Preparation of community management plan for O & M of drainage system and train community Soak pits constructed to discharge grey water 	<ol style="list-style-type: none"> 600 m RCC storm water drainage constructed Community organization strengthened to take O&M responsibilities 60 soakpits constructed 20 small manhole improvement and 9 large manhole construction
<p>3. Neighbourhood environment improvement. This activity will include</p> <ol style="list-style-type: none"> Identified brick paving in the neighbourhood Identified side drain construction to channel storm water where needed 	<ol style="list-style-type: none"> 200m brick paved neighbourhood area road including side drain 100m side drain constructed as identified in the plan
<p>4. In house environment improvement This activity will include</p> <ol style="list-style-type: none"> Installation of improved cooking stove Training on handling and maintenance of cooking stove Health and hygiene training to the community Construction of toilet 	<ol style="list-style-type: none"> Installation of 60 improved cooking stoves Community capable of maintaining the cooking stove Aware of good health and hygiene practices and adoption Construction of 35 toilets
<p>5. Building capacity of the community for sustainable development through micro-credit saving</p>	<ol style="list-style-type: none"> At least 3 saving groups will be organized to start saving.

B. Preparation of comprehensive waste water management plan	
1. Preparation of municipality level comprehensive plan for addressing waste water management	1. A waste water management plan at feasibility level will be produced with necessary data and maps.
2. Dissemination of the waste water management plan to stakeholders	2. 5 meetings of stakeholders including community leaders will be organized to disseminate the plan
3. Training of municipal technicians to understand and adopt the plan	3. 2 trainings will be organized for municipal technical staff and ward level staff.
4. Training of decision makers and senior municipal technicians of other municipalities to disseminate and promote the approach taken by Madhyapur Thimi Municipality.	4. 1 training will be organized for decision makers and technicians of other municipalities of Kathmandu Valley

Schedule of activities

Activities	Months										Outputs
	F	M	A	M	J	J	A	S	O		
A. Promotion of water and environmental sanitation practices in Tigni											
1. Improvement in water delivery											<ol style="list-style-type: none"> Three community tap installed A tube well lifting water from existing well is installed Awareness build on communities on water quality.
2. Improvement in storm water and grey water management											<ol style="list-style-type: none"> 600 m RCC storm water drainage constructed Community organization strengthened to take O&M responsibilities 60 soakpits constructed 29 small and large manholes constructed
3. Neighbourhood environment improvement.											<ol style="list-style-type: none"> 200m brick paved neighbourhood area road including side drain 100m side drain constructed as identified in the plan
4. In house environment improvement											<ol style="list-style-type: none"> Installation of 60 improved cooking stoves Community capable of maintaining the cooking stove Aware good health and hygiene practices Construction of individual toilets
5. Building capacity of the community for sustainable development through micro-credit saving											<ol style="list-style-type: none"> At least 3 saving groups will be organized to start saving.
B. Preparation of comprehensive waste water management plan											
1. Preparation of municipality level comprehensive plan for addressing waste water management											<ol style="list-style-type: none"> A waste water management plan at feasibility level will be produced with necessary data and maps.
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Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality

A 1. REPORT ON WATER DELIVERY IMPROVEMENT



A 1 WATER DELIVERY IMPROVEMENT

Proposed activities

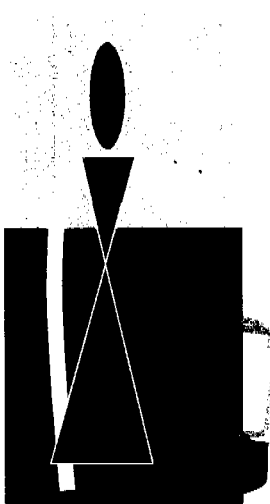
The Water & Environmental Sanitation Improvement Plan, 2005 have identified following activities to serve this poor settlement in terms of improving water delivery which are included in this project activities

1. Addition of three community water taps
2. Installation of tube well in the existing well to lift the water
3. Build awareness on impacts and mitigation measures on high dose of chlorine and use of spring water sources

Implementation of the activities

1. Addition of three community water taps

Tigni lies in the upper part of the Madhyapur Thimi watershed. As being in the higher altitude, there is a water reservoir next to the settlement which is serving Madhyapur Thimi, part of Bhaktapur and eastern part of Kathmandu municipal water supply system. Recently a new dug-well and water treatment plant was constructed near to this reservoir. Although this area is serving major areas of Kathmandu Valley, this poor settlement has to rely on two public taps and few conventional water sources like a well and two springs. Considering the demand, distance traveled to collect water especially by women members of family, and affordability of the community, the WESI plan has proposed three more taps for the area.



Recognizing the possibilities of misuse of public tap stands once they do not need to pay for public stand-posts in Nepal, CIUD proposed to go for community taps where a group of people fetch water from a tap and share the cost based on the meter reading. This is a new approach

where the two concerns viz. a) poor should have approach to affordable water, and b) water will be wasted if provided free of charge; are merged.

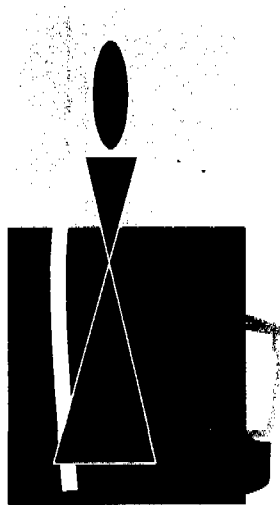
Implementation

Recently, with the support of ADB and DFID, a new initiation has started in Kathmandu Valley to address the water need of urban poor. Identified by previous studies and suggested by NGO Forum for Urban Water and Sanitation (where CIUD is vice-chair), the ADB financed Melamchi Water Supply Project and Kathmandu Valley Water Supply Reform initiatives have started its activities to install 1000 community taps. This includes taps mentioned in this project as well. Therefore, in coordination of the implementers, municipality and local office of UNHABITAT, CIUD has decided to withdraw this activity to avoid duplication and ease the broader approach of ADB supported Low Income Consumer Support Unit (LICSU) activities. Therefore, CIUD has not spent the fund for this purpose. However, we have helped in terms of mobilizing the community, forming community water consumer groups, designed tariff collection system and aware the community to this new approach of water distribution in poorer communities.

The members of three community tap water user groups formed are

Dathu Tole Community Tap Group

1. Sunil Rajbahak
2. Ganga Rajbahak
3. Ekadashi Rajbahak
4. Tulsiman Rajbahak
5. Manik Lal Rajbahak
6. Kanchha Rajbahak
7. Eghara Lal Rajbahak
8. Ram Kaji Rajbahak
9. Hira Lal Rajbahak
10. Gauri Rajbahak
11. Roman Rajbahak
12. Babu raja Rajbahak

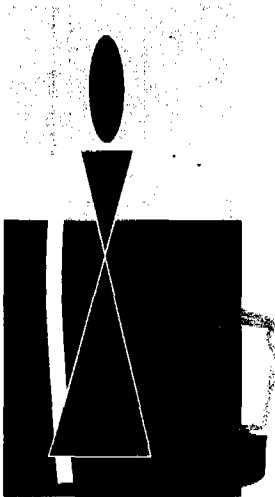


13. Purna Rajbahak
14. Milan Rajbahak

Kothu Tole Community Tap Group

1. Yogesh Rajbahak
2. Sanu Rajbahak
3. Manjari Rajbahak
4. Chakra Bahadur Rajbahak
5. Amalal Rajbahak
6. Maila Rajbahak
7. Santa Maya Rajbahak
8. Krishna Devi Rajbahak
9. Rameshwori Rajbahak
10. Saila Rajbahak
11. Binod Rajbahak
12. Ramdevi Rajbahak
13. Durga Rajbahak

Saraswotikhel Community Tap Group



1. Ram Bahadur K.C.
2. Renu K.C.
3. Dhana Maya Rajbahak
4. Hem Bahadur Rajbahak
5. Sarita Rajbahak
6. Yamuna Baniya
7. Ram Maya Rajbahak
8. Balaram Dhakal
9. Mathura Rajbahak
10. Bhaktamaya Rajbahak
11. Aarati Rajbahak
12. Rajeswori Rajbahak
13. Ram Rajbahak

It is expected that 50 families (~ 300 people) will be directly benefiting from this initiative. Women and girl children will be less burdened due to the nearness of the standpost.

2. Installation of tube well in the existing well to lift water

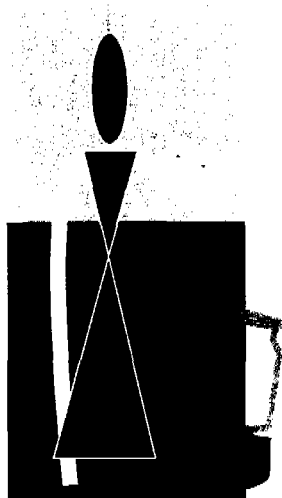


Renovating the dilapidated well

The traditional well at Taran Tole of Tigni is the only well in the settlement. This very old well is used primarily for washing, cleaning, bathing and animal feeding purposes. Due to difficulty in pumping the well was not very

much used. CIUD tested the quality of water which is very poor for drinking purpose. From the survey it was noted that very few families were using this water even for drinking. The WESI plan proposed to improve this well and install hand pumps so that users of this well will be eased, especially women. Since well was uncovered children used to throw garbage inside the well. Therefore, four activities were proposed to improve the well:

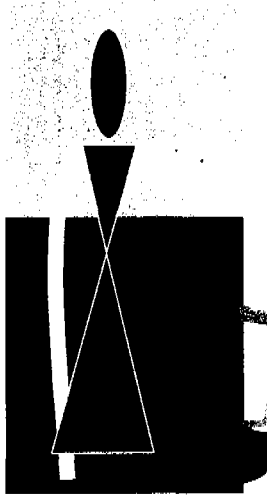
1. Cleaning of the well from inside
2. Improving wall and plate-form
3. Installation of hand pumps
4. Covering the well from top



Implementation

As per the design of the WESI plan, CIUD improved the well. With community participation the well was cleaned from inside, opened the clogged weep-holes of water, cleared the debris inside the well. The wall of the well was plastered, its opening was covered providing necessary manhole and inspection chamber, the working plate form was rehabilitated and two hand pumps were installed.

Rehabilitation of well started from the 3rd week of June. Community contributed in the form of labour and construction material (sand). The

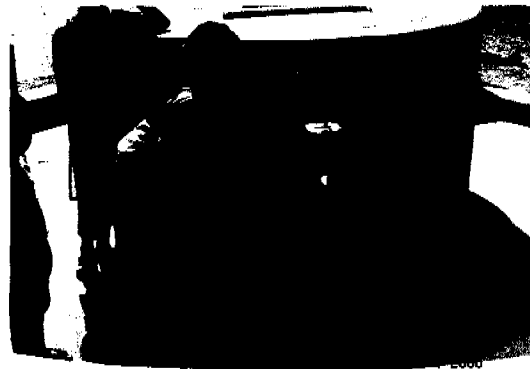


opening of the well was covered by reinforced cement concrete (RCC) slab. Two hand pumps were installed to draw the water from well for bathing, washing, cleaning and other purposes. Initially, only one hand pump was planned, but, during implementation, community suggested to install one more hand pump to reduce crowding in the well. So, two hand pumps have been installed to save the time for fetching water. The covering of well and installing hand pump helped to conserve the water from pollution. Other works such as plastering of walls, making non slippery platform was also completed. The community took part with enthusiasm. They helped in going inside the well, cleaning the weep-holes and clearing the debris from the well.



Local community volunteering to clean up the inner hole of the well

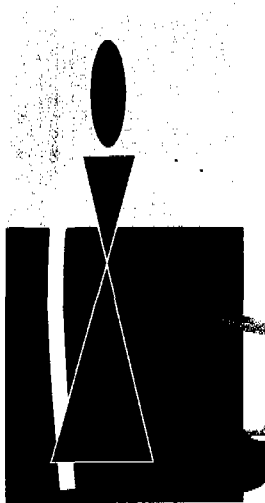
169 people including 88 male and 81 female gained direct benefit from this activity. As the well is situated at public place (Taran tole), number of beneficiaries increases during function and festivals



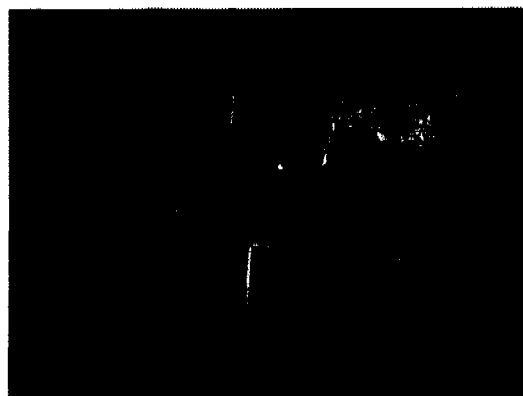
Children testing their new tube well

conducted at Taran tole. Apart from sanitation purpose, the well is also catering to the green leafy vegetable sellers to clean their vegetables. The total cost of rehabilitation of the well is estimated to be Rs. 17,850 which is shared by Water Aid Nepal Rs. 15,000 and Rs. 2, 850 through labour and material contribution.

3. Building awareness on impacts and mitigation measures of high dose of chlorine and use of spring water sources:



Quality of water is one of the major concerns indicated in WESI plan. Except turbidity and taste, people are not aware of water quality. The water quality analysis of sample water from various sources showed that all sources of water have



Demonstrating use of chlorine solution for water disinfection

one or other problems. For example the spring source of water has problem of microbial contamination and high nitrate concentration. Similarly, the well water also contains high nitrate and microbial contamination. The municipal supply has very high content of Free Residual Chlorine (FRC). People are not aware of the implications of using these water. Therefore, a training was proposed to make the community aware on water quality.

Implementation

Based on the recommendations in WESI plan a training module was designed to suit the target group. Since water is primarily handled by women members of families, the training was targeted to women



Participants of the water quality training

members of the society. Training on water quality, impurities, its causes, consequences and remedies was organized on 17 November, 2006. There were 24 women participants

in the training. The feedback from the community showed that the immediate impact of the training is very positive.



A school teacher discussing water quality in the training

The second important initiative on water quality improvement and awareness building was for the school teachers and students. In the absence of separate chlorinated water tank for Tigni, the water delivered to the area

contains high FRC. Therefore, an aeration system has been added before the collection tank to release the excess chlorine from water. Funding of this aeration system was made available from Water Aid Nepal, providing levered benefit to the initiative. A training session was organized to the teachers of the school and community leaders to make them aware of the initiative and methods of water treatment on February 9, 2007. Six teachers and six community leaders participated in the training.

It was expected that at least 24 families are aware of the water quality issues in Tigni. The indirect beneficiaries will be more than the participants as the knowledge will be shared during socialisation. The de-chlorination unit will provide direct benefit to 273 students and teachers in the school. Moreover, the training to the teachers on water quality issues will propagate the issues in the time to come.



Aeration unit installed in the school for de-chlorination of the FRC in piped water.

Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality

A 2. REPORT ON IMPROVEMENT IN STORM WATER
AND GREY WATER MANAGEMENT



A 2 IMPROVEMENT IN STORM WATER AND GREY WATER MANAGEMENT

Proposed activities

The Water & Environmental Sanitation Improvement Plan, 2005 have identified following short term activities to serve this poor settlement in terms of neighbourhood environmental improvement.

1. 600 m RCC storm water drainage constructed
2. Community organization strengthened to take O&M responsibilities
3. 60 soak pits constructed
4. 29 small and large manholes constructed

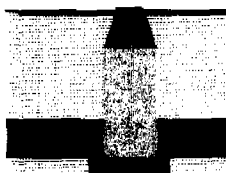
Implementation of the activities

1. Storm water drain construction

Settled on the southern slope next to the popular Nil Barahi shrine, the runoff water from this area flows to Hanumante River passing through the agricultural fields. There are two main drains built for storm water conveyance from the settlement. The condition of 280 meters long left drain following Tigni Nil Barahi Marg was poorly constructed and slightly undersized. Some part of the drainage line was also broken.



Broken drain in Tigni Nil Barahi Marg



From Mahadevsthan Temple to the public stand post, the drainage pipe was missing. Therefore, the water flows on the surface on these dirt

roads making the access very uncomfortable, especially to pedestrians. There are several cover slabs of connection chambers which were broken and are in need of renovation. One of the reasons for breaking of these covers is the movement of heavy vehicles over the poorly constructed connection chambers and thin cover slabs. The right drain 0.35 km is relatively new and is in good condition except for occasional cleaning. The upper stretch of the drain is linked with PVC pipe. In both the drains some houses are discharging waste water also, most of it is grey water but some 4 houses are also discharging black water in to the drain.

In the absence of ultimate disposal, both of these drains ended at Tigni Saraswotikhel

Marg, the main road linking Tigni from other settlements. After the development of Sintitar Land Development Project, the storm water is not allowed to drain downstream

through this area. This blockade kept the main road always muddy and slippery. The existing drains in Tigni were constructed with



Community organisation mobilized the locals to dig the trench for laying the drain



RCC pipes brought for storm water drain construction

the support of DDC and the municipality. However, no management plan is available for operation and maintenance of the system, nor any responsible agency to do so. When the drains are clogged, it is left to the nearby households to clear the clogged debris. Hence during the rainy season this road

becomes virtually inaccessible specially making it very difficult for the school children who walk to school.

Implementation

During the WESI plan presentation to the community and prioritization of the activities, storm water drain was the first priority that the community wanted. Therefore, high priority was given to implement this activity.



Under this activity 600m RCC drain was proposed. Based on the requirement, 460m NP2 RCC drain and 123m NP3 were constructed. Renovation of existing drainage and rain inlets were also carried out. Being a capital intensive work demanding skilled manpower, the community contributed about 120 person-days of unskilled labour force in this activity.

The beneficiaries of this activity may be considered the whole Tigni population (ie. 809) as the drainage has helped them to discharge storm water safely from the settlement and kept their roads and neighbourhood dry.

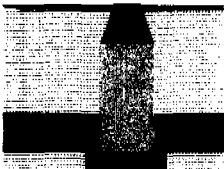
2. Community organization strengthened to take O&M responsibilities

Sustainability is one of the important issues that need to be incorporated in drainage construction. In the poor settlements, people are less influential to the decision makers. Therefore, CIUD has considered strengthening the community itself for the maintenance and repair of the drainage system installed. Two activities were planned for this purpose.

1. Demonstrate the importance of drainage cleaning
2. Train the community on infrastructure maintenance
3. Establish maintenance fund from the beginning

Implementation

At the beginning of the storm water drainage improvement activity, CIUD initiated a drainage cleaning campaign along with the community and the municipality. The municipality provided jetting machine and drainage cleaning tools while the community joined hands in cleaning the drains. This initiation showed the community that why it is so important to maintain the system regularly. More than hundred community people participated in the campaign.



Community using jetting machine to clean the existing drain



Removing the sludge from the inlet chamber

Training will be organized to make the community aware and capable of taking care of the infrastructures including storm water drains. It will be focused on various types of repair and maintenance activities that will be needed for the proper operation of the system.

Maintenance system will be established in Tigni which will be divided into regular maintenance, periodic maintenance and special maintenance. It will be proposed that at least once in a year whole length of the drain will be cleaned using jetting machine and debris/sludge will be removed, minor maintenance will be carried out. These will be done through TSBS with the technical support of the municipality.

It is proposed to establish a maintenance fund for the repair and maintenance of the system. CIUD will grant certain amount where the community will collect some fund as their counterpart share. This amount will be saved in an interest earning bank account under TSBS. Rules will be set for the utilization of the fund.

3. Construction of soak-pits

Tigni lies in the peri-urban area of Kathmandu Valley. With the given setting of the settlement, it may not be necessary to build drains serving

each house. The sanitation facilities like toilets are decentralized having its own collection / management system.

Therefore, for the grey water management, WESI plan has proposed soak pits to those houses which are not in the vicinity to storm water drain. For those who can discharge their grey water in storm water drain, small platform was constructed for washing their dishes and clothes. This has



Washing place on the pavement for grey water discharge



Utilising the washing place for bathing of a child

helped draining the grey water into the drain and keep the neighbourhood clean.

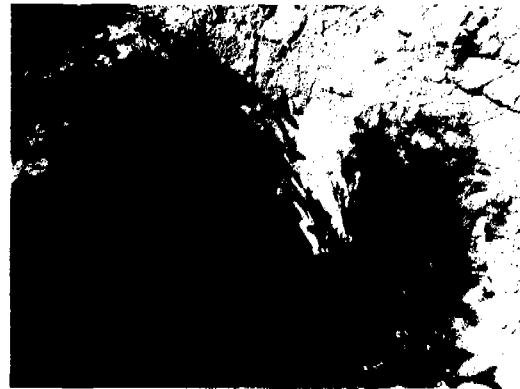
In the area unserved by storm water drain, soak pits were promoted. Soil permeability study was done while preparing the WESI plan. Based on the soil character, soak pits are designed to discharge grey water which

includes hand washing, dish washing and washing of clothes at home, etc. For large volume of cloth washing, the community goes to public taps or well. Since grey water is not polluted as black water, it can be safely discharged into the soak pit.

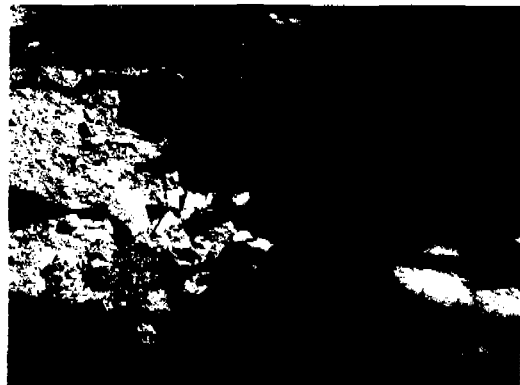
Implementation

As per the proposal 60 soak pits were proposed for Tigni. 1 to 1.5m deep and 1 to 1.5 m diameter hole is dug near the dish washing place outside home. These holes are back filled by brick bats and covered by sand. These pits help to infiltrate the grey water. This can be done with nominal cost. The beneficiary contributed by digging the hole while the project provided brick bats and sand to fill the hole.

Size has been changed according to their requirements. Soak pits were constructed where there is need and possible to construct. For the houses next to the storm water drain these pits are not necessary. Therefore, in stead of constructing pit, washing



Hole dug for soak pit



Soak pit filled with brick bats



Topping the brick bats with sand

place was constructed. In some houses their dish washing location is in the damp land where soaking is not possible. Therefore, these houses are left.

4. Small and large manholes constructed

Construction of manhole is one of the expensive parts in storm water drain construction. There were 9 large and 20 small manholes proposed for the construction in the existing drain as well as new drains. The small man holes are the collection chambers, which allow the storm water to pass into the drain safely while the larger manholes provide room for maintenance and inspection of the drain as well.

Implementation

9 main holes are provided in the main drain. These man holes are built with brick walls and covered by cast iron man hole cover moulded in concrete.



Man hole in the main drain

Small man holes are the collection chambers. These collection chambers also provide connection point for side drains and rain inlets. Two RCC slabs were used to cover these chambers. 20 such small manholes



Small man hole in the upstream drain

were constructed. Almost 12% local contribution was generated in this

construction. This value of contribution was generated through labour cost of 215 person days. As these man holes are part of the drainage system, the beneficiaries of the system may be taken similar to storm water drain.

Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality

A 3. REPORT ON NEIGHBOURHOOD
ENVIRONMENT IMPROVMENT



A 3 NEIGHBOURHOOD ENVIRONMENT IMPROVEMENT

Proposed activities

The Water & Environmental Sanitation Improvement Plan, 2005 have identified following activities to serve this poor settlement in terms of neighbourhood environmental improvement.

1. 200m brick paved neighbourhood area road including side drains
2. 100m side drain constructed as identified in the plan

Implementation of the activities

1. Surface improvement of Tigni through brick paving

According to WESI plan, the important part to improve the neighbourhood environment in Tigni is to improve the present condition of road condition, brick paving the inner lanes/streets, courtyards, improving the inner lane drains and connecting them to main drains. Undulated road and walkway surface, absence of surface drainage and littering debris and wastes in the surroundings not only



Public school area before brick paving



School area after brick paving

pollute the area visually but provide habitat to the hosts of diseases.

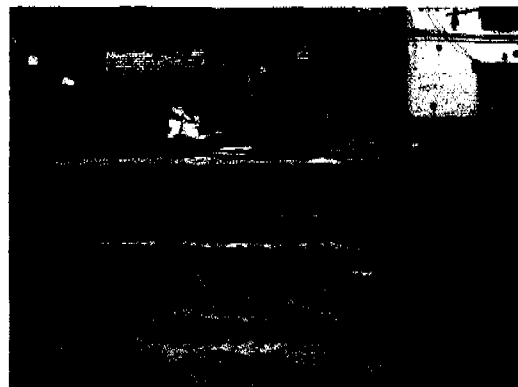
Moreover, women and elderly people face problem of slippery while carrying water and other loads back home. Paving of these neighbourhood spaces has a social importance as these clean surfaces provided space for social interaction, sun bathing of elderly and delivered women, and a very good space for children to play. Therefore, the main objective of this initiation is to keep the outer environment clean and healthy.

As integrated urban environmental sanitation is the priority of UNHABITAT under Water for Asian Cities Programme, this is one of the important initiatives in improving sanitation in this poor settlement.

This activity was very much appreciated by local people. They participated in the construction activities with very high enthusiasm and contributed more than it was initially designed.



Taran Tole, the community space being improved



Taran Tole after brick paving



Newly paved surface provide space for socialization, playing ground and drying food.

Implementation

The brick paving work was started from the courtyard in front of Tigni School so that school children can be benefited immediately. The ground was undulated with brick bats laid before. All the brick bats were removed and levelled the ground properly. All these works had been carried out by community participation. Then, for the laying of bricks, supply of sand was also carried out with the help of community. The school children and the teachers also participated with enthusiasm. The project provided only the bricks to the community for all brick paving works whereas community people contributed about 52% through labour and material (sand).

Then, work progressed on Taran Tole and inner lanes. Each house was responsible for contributing their portion of lane in front of their house. The decision for such practices was taken with the help of Tigni Samudaik Bikas Samiti (TSBS), the users committee and interaction with community people. TSBS has been mobilizing the community for all kind of community participation.



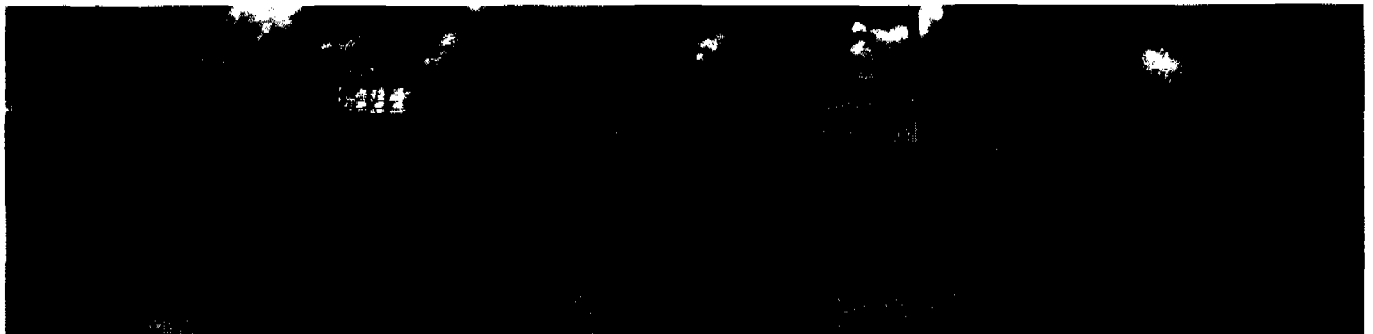
Paving the eastern walkway in Tigni



At present 986 square meters (i.e. 200 meters in length) of brick paving works has been completed. 264 students and 9 teachers of this public school were benefited directly by brick paving in front of school. This place is also being used by Tigni community for their festivals such as Krishna Astami Pooja, Gaijatra, etc. Whole community of 809 people were benefited by brick paving in front of the school. These beneficiaries of 809 people were also benefited by brick paving in Taran tole, another public place of Tigni. Each household which are situated along the inner street were the direct beneficiaries.

Excited by the clean environment in the area, the community was enthusiastic in adding some length of brick paving in Tigni. The road joining Tigni to Saraswotikhel Road from east with length of 148 m and 2.5m in average was paved with the participation of local community. This road is also important from cultural point of view as they need to walk bare-footed when they carry their dead body from the settlement to the cremation place.

With the support of UNHABITAT, Tigni could generate levered benefit by attracting investments from other agencies. Water Aid Nepal is also providing support in Tigni for sanitation activities. Madhyapur Thimi Municipality showed its commitment by black-topping part of entry road which otherwise would not take place normally. The municipality is also committing for additional works in Tigni, which can be taken as the outcome of the initiation of UNHABITAT/CIUD activities of poverty mapping and exposing the condition of the people of Tigni. It is proposed that the main road crossing the settlement will be blacktopped by the municipality in this fiscal year through local development fund.



Blacktopped road in Tigni constructed by Madhyapur Thimi Municipality

2. Construction of side drains

In most of the street paving works side drains were missing. In the absence of side drains, the storm water accumulate on the pavement creating filthy environment and gradual damage of the road surface. Therefore, the WESI plan has proposed construction of 100 m side drains in Tigni. These shallow depth drains are purposely not covered from the top so that the siltation and accumulation of the debris in the drain can be cleaned regularly.



Implementation

The construction of side drain of size 230x110 mm was carried out along with the brick paving. These side drains discharge into storm water drain. 100 meters of such drains were constructed.

Community participation of about 38% was available in constructing these drains in terms of unskilled labour and required quantity of sand.



Constructing side drain in Taran Tole

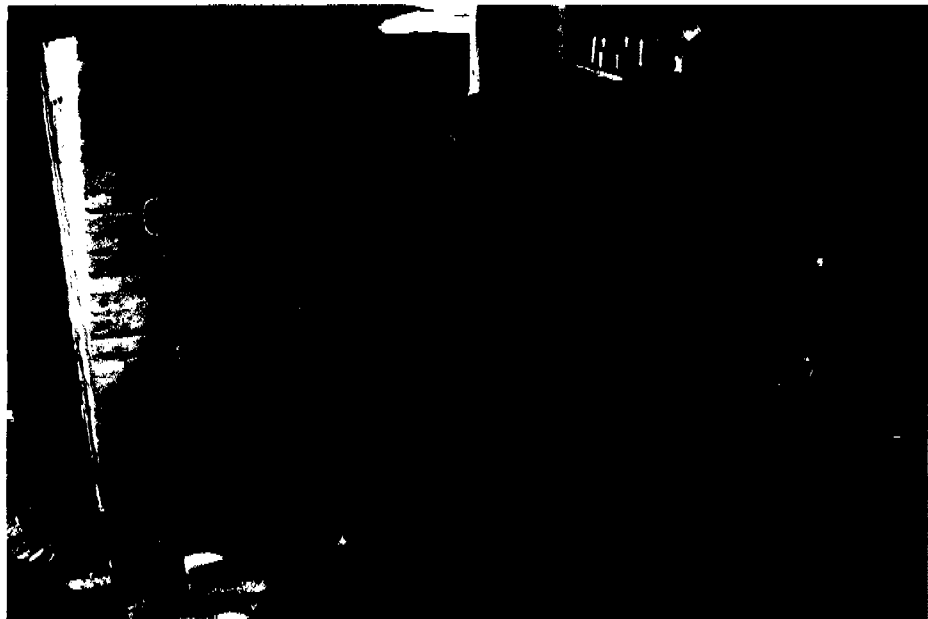


Completed side drain kept the settlement dry after rain



Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality

A 4. REPORT ON IN-HOUSE ENVIRONMENT
IMPROVEMENT



A 4 INHOUSE ENVIRONMENT IMPROVEMENT

Proposed activities

The Water & Environmental Sanitation Improvement Plan, 2005 have identified following immediate activities to serve this poor settlement in terms of neighbourhood environmental improvement.

1. Installation of improved cooking stoves
2. Training on handling and maintenance of cooking stove
3. Health and hygiene training to the community
4. Construction of individual toilets

Implementation of the activities

1. Installation of improved cooking stoves

Because of their traditional profession of making beaten rice, majority of the houses in Tigni have kitchen on the ground floor. The Water and Environmental Sanitation Improvement (WESI) Plan prepared in 2005 shows that 64.4 per cent families use solid fuels such as wood and agricultural by-products for cooking. In the absence of proper ventilation, people are exposed to harmful smoke for long hours. Some twenty houses are directly involved in preparing parched beans and grams as snacks,



The smoky kitchen environment



following their traditional profession of preparing beaten rice. To prepare these snacks they need to be in the kitchen for long hours everyday, especially women, exposing themselves to the smoky environment. WESI plan had recommended promoting improved cooking stove in Tigni to overcome this problem.

Implementation

According to the recommendation of WESI plan improved cooking stoves were promoted in Tigni. Several activities were planned for the successful implementation of the activity. The activity is divided into three steps:

1. Training of the locals on making of improved cooking stove.
2. Demonstration of the use of improved cooking stoves.
3. Refresher training to the improved cooking stove makers.

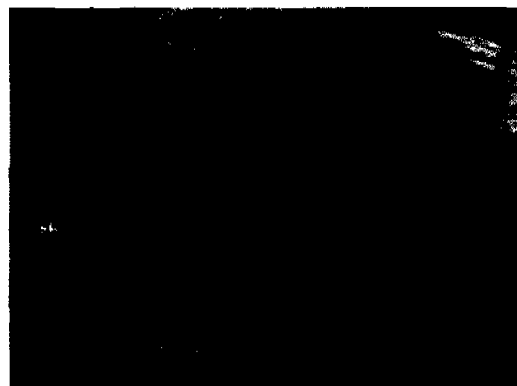
To promote improved cooking stoves, local women were encouraged to take part in the training. Apart from the



Women eagerly participating in the making of improved stove



Preparing clay for their stoves

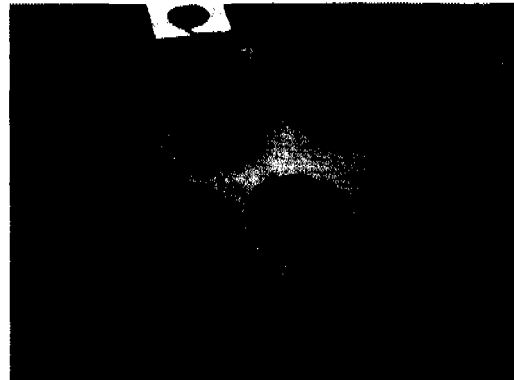


Handmade brick dried in sun for making improved cooking stoves

women participants, few masons were also trained for backstopping and transferring the technology, especially the technical details of the stove. An orientation meeting was organized where the participants showed their interest in participating in the making of the improved cooking stoves.

Five teams consisting three women in each team were formed. A five-day long training was organized in Tigni. A trainer was invited from Improved Stove Promoters' Association.

Mr. Surya Prasad Timalisina, chairperson of the organisation was the trainer. There were 22 participants in the training. The training was divided into three



parts. In the first part the technical aspects were discussed. In the second part, all the participants were demonstrated on how the stove can be built. It was followed by hands-on training of the participants. The third part was spent on taking care and maintenance of the stove. The training was very encouraging.

Replica of the improved three-mouth stoves

A demonstration stove was built to demonstrate the use of the stove. Several families were encouraged to go for the new stove. However, after some days some loss of enthusiasm was observed. CIUD discussed with the stove makers to understand the causes of unwillingness. It was found that the stoves made in early days were not functioning as expected. The trainer was invited second time to observe the difficulties. It was noted that most of the families did not wait for complete curing period of 15 days as they did not have alternate stove to cook their food. Encouraging the participants to keep their patience, the second lot of stoves was made. The refresher training was organized for two days which was participated by 24 participants. This increase in number also showed their enthusiasm in the making of the stove.



This time the stove was used only after completing the curing period. These stoves showed negligible smoke, reduced the consumption of fire

wood and reduced the cooking period. Therefore, now many families have already built the stove.

One inconvenience was observed with the stove in Tigni. The households involved in parching beans and grams required three-mouth stoves instead of the popular two-mouth stoves. One stove was built for a trial. Unfortunately, this design is not very successful. Therefore, these families are not enthusiastic in adapting the improved cooking stove. Moreover, to parch the beans they need certain degree of temperature which could not be maintained by the improved stove. Therefore, these families are obviously not interested in this stove.

For the sustainability of the cooking stove initiation, two strategies were adopted. Training was given to the women so that even in future when they want to built the stove, they keep the skill. Instead of providing materials as subsidy, the office provided remuneration to the stove makers, where the stove owner provides all the materials including hand-made special sun-dried bricks. Remuneration of Rs. 300 was provided to the stove makers per stove as a subsidy. The cost of other materials including labour cost provided by the stove owner is around Rs 700 .Four sets of moulds to make hand made bricks and other accessories were handed over to the Tigni Samudayik Bikas Samiti- the users' group of Tigni. These tools can be borrowed by the stove makers whenever necessary. As



Finishing her own stove making.



expected, few trained women have encouraged their fellow settlers. It is interesting to note that some of them are also promoting the technology in other settlements where they charge Rs. 400 for making a stove. Recently, they have received request from neighbouring settlements as well.

Until today 35 improved stoves have been constructed in Tigni. There are several limitations observed during promotion of the stove.

2. Training on handling and maintenance of cooking stove:

The improved cooking stove was completely new to the community. So, in order to aware about the improved cooking stove two types of training were conducted in Tigni.

Two formal trainings were organised to transfer the skill of making improved cooking stoves. As mentioned above, these trainings were instrumental in encouraging the locals for constructing these environment-friendly stoves. Both the trainings covered the maintenance part; however, the later was more focused on the maintenance.

For the new builders, the stove makers orient them on issues of handling and maintenance of the stoves.

Implementation

For the implementation of this activity, five-day training was conducted from August 29 to September 2, 2006 on construction, handling and maintenance of improved cooking stove. There were twenty-two participants with twenty female and two male participants.

The main objectives of this training were:

- To give theoretical and practical knowledge on improved cooking stove
- To train on construction procedure of improved cooking stove
- To give knowledge on proper use of improved cooking stove
- To develop skill for maintenance of constructed improved cooking stove



Refresher training was full of questions.



To enhance the knowledge about improved cooking stoves two days refresher training was conducted from December 8 and 9, 2006. The main objectives of this training were:

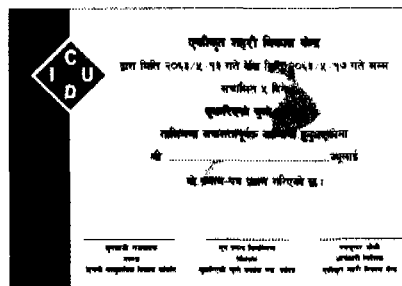


- To promote the improved cooking stoves
- To develop positive aspects of the improved cooking stoves as well as to draw attention of community people towards cooking stove
- To point out the problems of previously built improved stove and to give the solutions of problems.
- To build the confidence among the promoters in promoting the improved cooking stoves.



Sharing her joy of new stove with CIUD staff.

This training was then considered to be fruitful and the number of improved cooking stoves also increased drastically after the refresher training.



Certificates distributed to the trainees of improved cooking stove.

3. Health and Hygiene training to the community:

Health and hygiene is one of the major issues of the community as indicated in WESI plan. Different factors are playing role in personal hygiene issues. Open defecation, absence of hand washing practices,

smoky in house environment are some of the causes of the poor health condition of the people.

Implementation

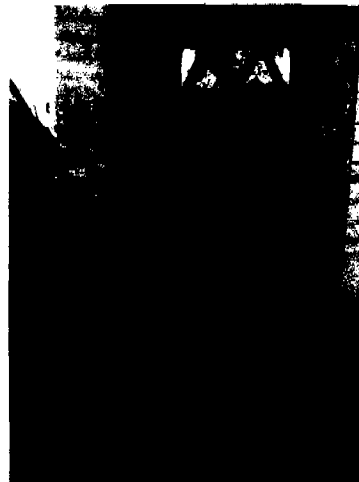
According to recommendations in WESI plan a training module was designed to aware the community on the impact of smoky environment. Since women are exposed to this type of environment for longer hours to prepare daily meals as well as to earn their living, the training was targeted to the women members of the community. The training was



Participants of the health and hygiene training

organized on May 28, 2006. It was focused on the harmful effect of smoky in-house environment and its improving measures. Thirty-four women took part in the training. The training was conducted on participatory and

interactive approach. This helped the participants to understand the effect and impact on their health due to smoky in-house environment more easily. Apart from the impacts of the smoke, the training also included personal hygiene issues.



Children are trained for hand washing habits after defecation.

4. Construction of Individual toilets

Open defecation practice is major problem in Tigni due to lack of proper access to toilet facilities. Thus WESI plan has recommended construction of toilets for individual houses. According to WESI Plan there are 58 toilets out of 116 houses in Tigni. Ten ECOSAN toilets had been constructed in fiscal year 2005/06 with the support of Water Aid Nepal (WAN). Among 116



Open defecation was common in Tigni



houses, now 68 houses have toilets facilities and rest do not have those facilities. CIUD has targeted to construct toilet for all these remaining houses and aimed 100 per cent toilet coverage in Tigni within this fiscal year. This year another organisation called World Vision also constructed 10 toilets in the settlement under their children support programme. Therefore, the remaining toilets to be constructed came to 38 only.

Water Aid Nepal was involved in the water and sanitation improvement works of Tigni from 2005. This year the organisation is also supporting the area in this activity. CIUD has used the funds available from WAN primarily in toilet construction. Therefore, cost of construction of the proposed 35 toilets constructed in Tigni is will be shared by UN HABITAT and WAN.

Implementation

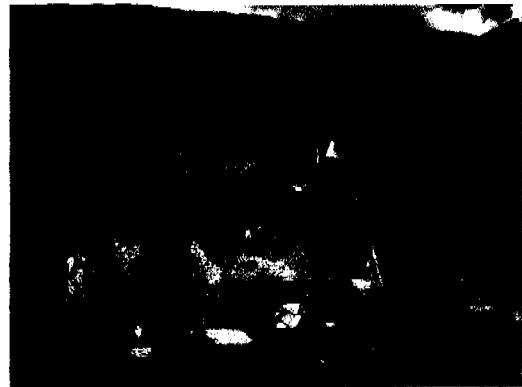
For implementing this activity, community people were introduced with different types of toilets such as Sulabh, ECOSAN and pit latrines . As per the demand of the local people 33 sulabh toilets (double pit latrines) have been constructed till now. Construction of two more has already initiated.

To support this activity a training was conducted on 17 November 2006 to explain the working procedure of the toilet and its using method. The training was designed for women groups as they are primary care takers. Twenty-four participants took part in the training.



Enthusiast participation during Sulabh toilet construction

There were primarily three sources of fund mobilised for construction of toilet. Water Aid Nepal contributed 53% and the share of UN HABITAT is 8.5%. The remaining 38.5% is bared by the community through materials and labour. The contribution of the toilet owner includes labour, sand, door frame and rafters for the roof.



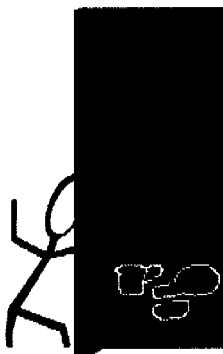
Poor household proud with newly build toilet

Several difficulties were observed during the construction of the toilets. One of the major constraint was



Toilets: a new landmarks in the settlement

unavailability of space for toilet. Extremely poor households have very small parcel of land which can not accommodate these toilets. In those cases the toilet size and design was modified to fit the availability. Land dispute was another issue.



Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality

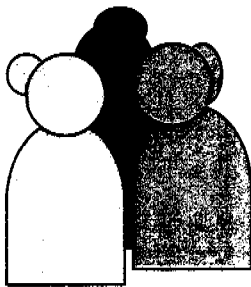
A 5. REPORT ON MICRO-CREDIT SAVING



A 5 MICRO-CREDIT SAVING

Proposed activities

Tigni is one of the poorest slum settlements in Kathmandu Valley. The poverty mapping study showed that more than 88% of the community dwellers are earning less than one dollar per day. For the overall development of the area economic capability building is equally important along with water and sanitation services. Therefore, this project has included initiation of micro-credit saving groups. It was expected that during the project period at least three saving groups will be formed.



In the past there were some initiatives already taken to bring the women in saving net. However, in the absence of proper support in the process most of these groups were inactive and collapsed. Some of past initiatives also mixed men and women in the same saving group. Obviously, in the male dominant society, women had little say in the savings. Therefore, women saving groups are proposed in this project.

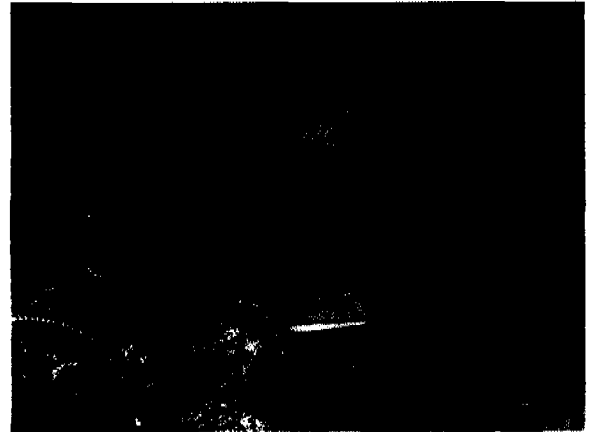
Implementation of the activities

Three micro-credit saving groups start saving

To uplift the poor community of Tigni economically and bring them in the mainstream of development along with other people, micro-credit could be one of the tools that has proven to be effective. Therefore, saving groups were formed. The target population for this purpose was women. Two aspects are considered while saving groups were formed: a) the saving will be collected for a year before lending; b) if requested some skill trainings will be provided to the group so that they can start new venture on their own.

Implementation

CIUD started mobilizing the women in Tigni for micro-credit saving groups from the start of this project. At the beginning they were made aware why women's saving groups are important. Exposure visits were organized to show them how other women folks are benefiting from this initiation. Encouraged by the success of the others and potential of financial sustainability in the family; women in Tigni started forming saving groups. Several meetings were conducted to organize the women into saving groups.



Tigni Women Awareness Group discussing saving issues

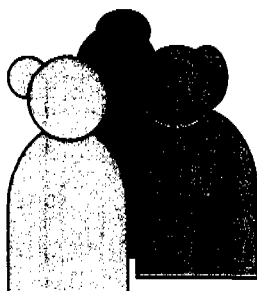


Tigni Women Active Group discussing their concerns

Two main women saving groups were formed at the beginning. These are **Tigni Women Awareness Group** and **Tigni Active Women's Group**. Under Tigni Women Awareness Group, 13 women participated while in the second group 45 women came to join. The optimum member for a group is 12 to 15. Being large number to handle, the second group is divided into four groups. Mr. Anil Maharjan, micro-credit expert provided several trainings on saving principles, management methods, fund management, etc. System was designed along with the saving groups.

Women saving group	Training date
Tigni Women Awareness Group	May 20, 2006
Tigni Active Women Group	June 10, 2006
Tigni Active Women Group	June 17, 2006
Tigni Women Awareness Group	June 17, 2006
Tigni Active Women Group	December 1, 2006

In all saving groups each member is saving Rs. 55 every month; out of which Rs. 5 will be spent on group welfare activities while Rs. 50 will be the saving. To establish saving habit, the saving will be continued for a year. After a year the members can ask for loan under group guarantee. Several regulations were also set like fine for late comers and absent member, fund management, meeting date and time, etc.



Two skill trainings were conducted under the request of the saving groups. Those are liquid soap making training and improved stove making training. At present some members are producing liquid soap and few others are building improved stove in the settlement as well as in nearby settlements.

Trainer and community mobiliser visited the groups regularly. They attended their meetings to support them in confusions and encourage them in their initiatives. At present three groups are actively doing their job while two groups under Tigni Active Women's Group are relatively inactive. The active groups are planning to open a



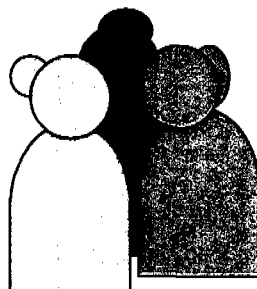
The women saving group members selling their liquid soap in a fate

bank account to save their savings. CIUD helped them in keeping the accounts and maintaining the records. Until now the savings of each active group is above Rs. 7000. CIUD will add equivalent amount of money as grant to each saving group after a year.

The members of women saving groups are as follows:

Tigni Women Awareness Group

	Name	Title
1	Rama Rajbahak	Chairman
2	Jamuna Rajbahak	Secretary
3	Rajani Rajbahak	Treasurer
4	Mathura Rajbahak	Member
5	Aarati Rajbahak	Member
6	Devi Rajbahak	Member
7	Santamaya Rajbahak	Member
8	Dhanmaya Rajbahak	Member
9	Rajeswori Rajbahak	Member
10	Rameswori Rajbahak	Member
11	Gyanu Rajbahak	Member
12	Yamuna Rajbahak	Member
13	Dil Kumari Rajbahak	Member



Tigni Active Women's Group A

	Name	Title
1	Amrita Khadka	Chairman
2	Sarada Karki	Vice Chairman
3	Sangita Khadka	Secretary
4	Yamuna Khadka	Vice Secretary
5	Sobha Khadka	Treasurer
6	Rupa Karki	Member
7	Nirmala Khadka	Member
8	Sabitri Khadka	Member
9	Sunita Khadka	Member
10	Mandira Khadka	Member
11	Sita Khadka	Member

Tigni Active Women's Group B

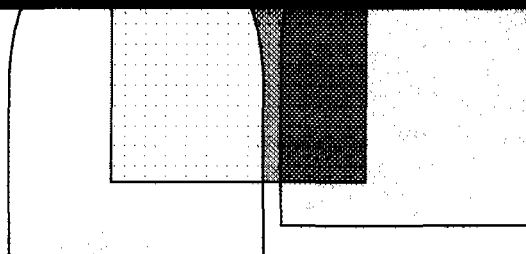
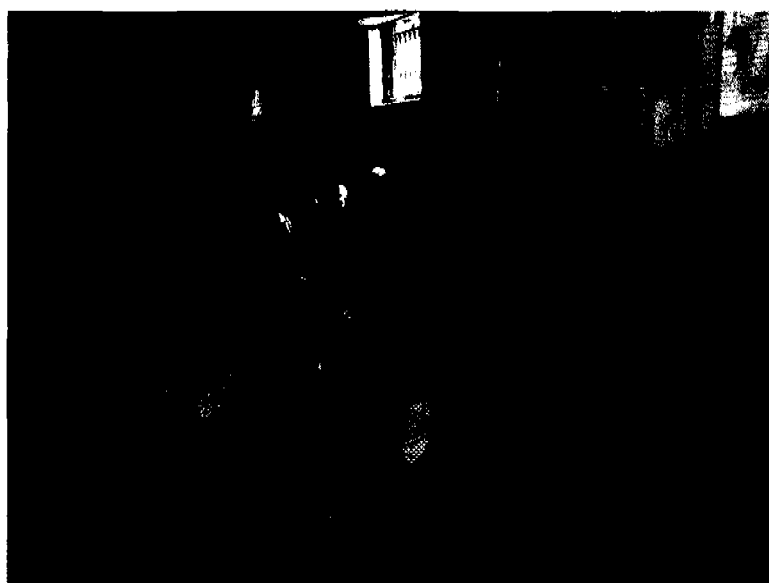
	Name	Title
1	Kalpna Rajbahak	Coordinator
2	Chameli Rajbahak	Coordinator
3	Sangita Rajbahak	Member
4	Manmaya Rajbahak	Member
5	Sundari Rajbahak	Member
6	Nabina Rajbahak	Member
7	Biju Maya Rajbahak	Member
8	Krishna Devi Rajbahak	Member
9	Mangal Maya Rajbahak	Member
10	Sunita Rajbahak	Member
11	Anita Rajbahak	Member
12	Bhuli Rajbahak	Member
13	Sunkesari Rajbahak	Member

Tigni Active Women's Group C

	Name	Title
1	Dilmaya Rajbahak	Coordinator
2	Gita Rajbahak	Coordinator
3	Apsara Rajbahak	Member
4	Sumitra Rajbahak	Member
5	Junu Rajbahak	Member
6	Surya Maya Rajbahak	Member
7	Tirtha Maya Rajbahak	Member
8	Anu Rajbahak	Member
9	Saili Rajbahak	Member
10	Surya Maya Maka	Member
11	Dhan Maya Maka	Member

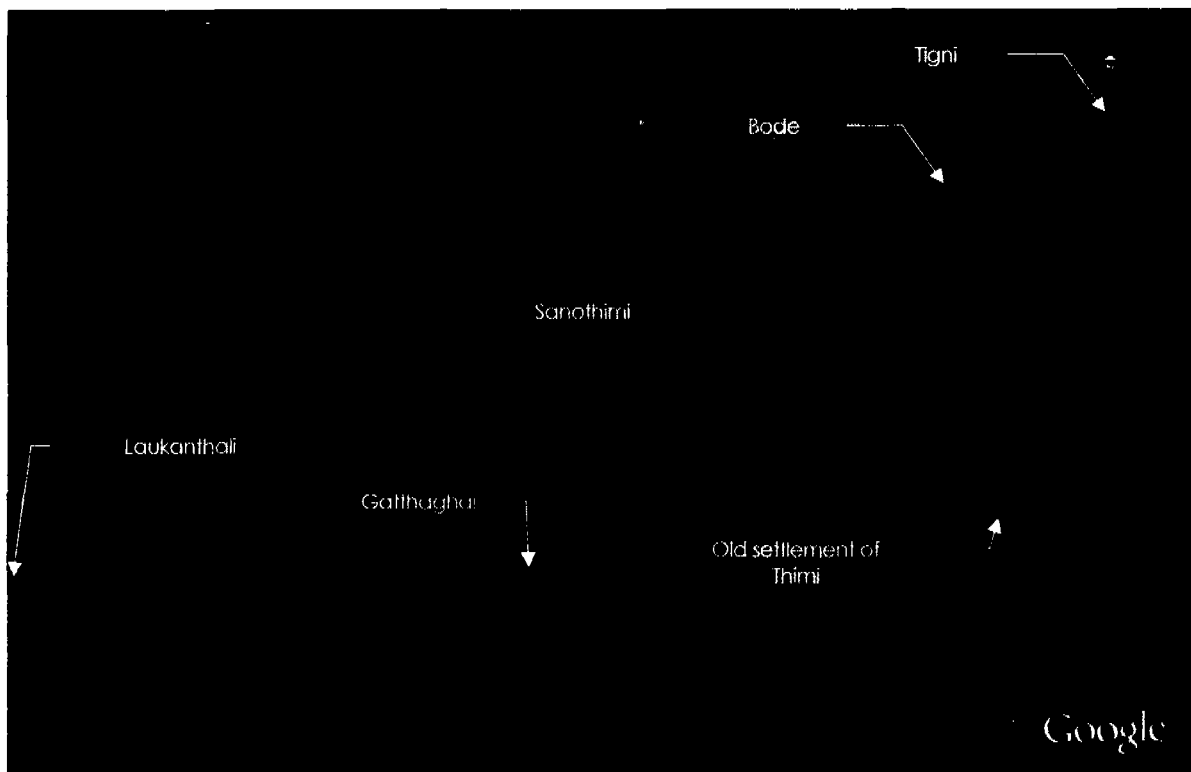
Tigni Active Women's Group D

	Name	Title
1	Uma Rajbahak	Coordinator
2	Sunita Rajbahak	Coordinator
3	Roshani Ha Shrestha	Member
4	Rashmi Ha Shrestha	Member
5	Sharmila Ha Shrestha	Member
6	Sunita Ha Shrestha	Member
7	Rita Shrestha	Member
8	Sanu Rajbahak	Member
9	Gita Khadka	Member
10	Prabha Chauhan	Member
11	Uma Rajbahak	Member
12	Sunita Rajbahak	Member
13	Roshani Ha Shrestha	Member



Implementation of WESI Plan of Tigni and Preparation of Waste
Water Management Plan for Madhyapur Thimi Municipality

B. REPORT ON PREPARATION OF WASTE WATER
MANAGEMENT PLAN FOR MADHYAPUR
THIMI MUNICIPALITY



B

WASTE WATER MANAGEMENT PLAN FOR MADHYAPUR THIMI MUNICIPALITY

Proposed activities

While preparing comprehensive waste water management plan for Madhyapur Thimi Municipality, following activities are proposed:

1. A waste water management plan at feasibility level will be produced with necessary data and maps.
2. 5 meetings of stakeholders including community leaders will be organized to disseminate the plan
3. 2 trainings will be organized for municipal technical staff and ward level staff.
4. 1 training will be organized for decision makers and technicians of other municipalities of Kathmandu Valley

Implementation of the activities

1. Preparation of waste water management plan

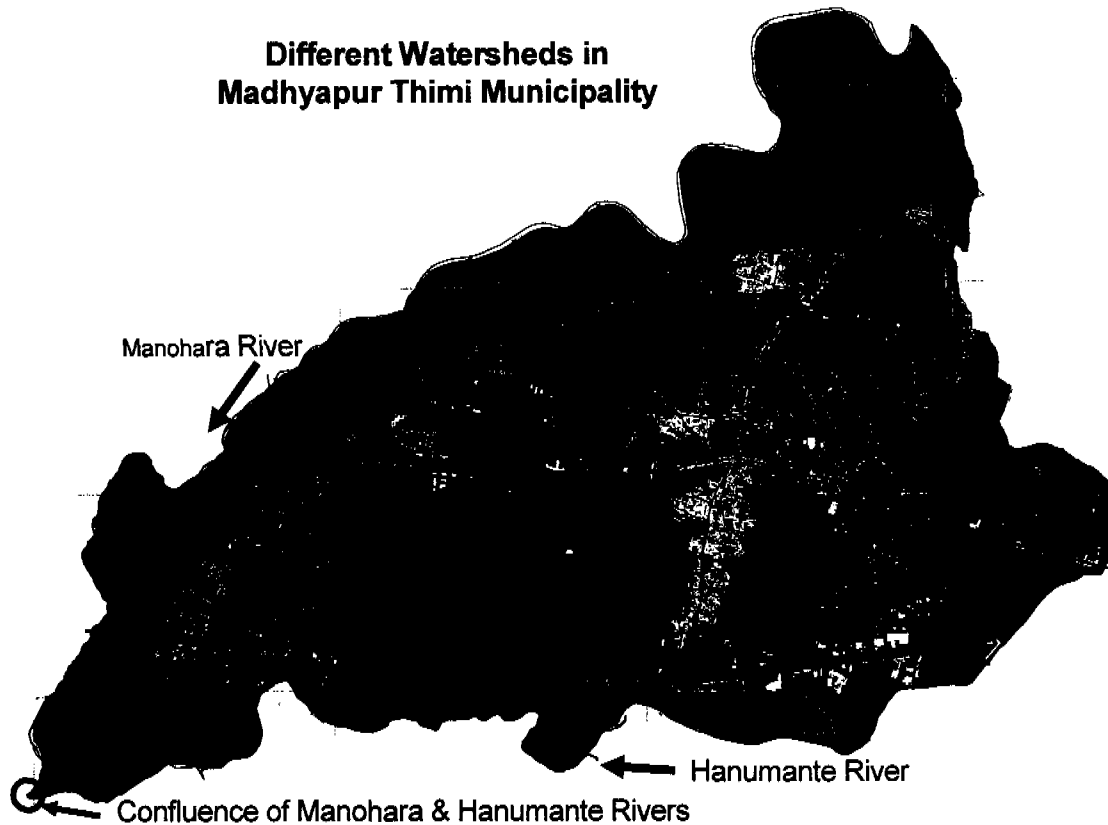
Available information on waste water management initiatives in Madhyapur Thimi Municipality were collected and studied. There were three major documents available from the municipality:

1. The Integrated Action Planning document of the municipality completed in 1999.
2. The drainage plan prepared for Dibeswori area of the municipality.
3. Sanitary sewer network design and treatment plant design of the core settlements of Thimi conducted few years back.

A study was also conducted by Mr. Oliver Zimmerhagl, volunteer from DED, Germany in 2003. It was observed that mere preparation of technical plan is not adequate for the purpose. Unless and until political commitment is not achieved, the study can not be implemented.

Therefore, discussions with the stakeholders were also planned in the preparation of the waste water management plan.

Different Watersheds in Madhyapur Thimi Municipality

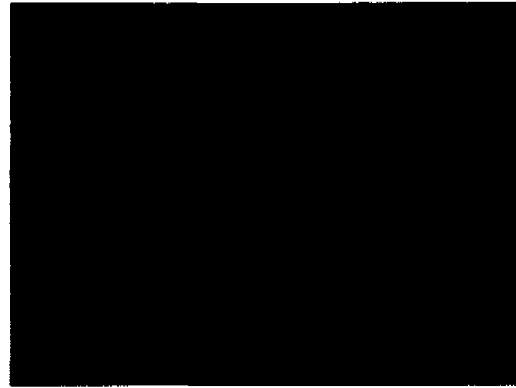


Implementation

Available information on the initiatives of Madhyapur Thimi Municipality was studied. A primary meeting was conducted in Madhyapur Thimi Municipality board members. Municipalities in Nepal do not have elected representatives from 2002 due to political insurgency in the country. Several ad hoc initiatives were taken to fulfil the absence of the representatives. In the absence of the political representatives, chief executive officers are taking the charge of the mayors. Therefore, interaction with Mr. Bishnu Gautam, Chief Executive Officer and Mr. Satya Narayan Shah, engineer was made from the beginning.

The whole municipality was divided into several watersheds following the natural drainage line. Two rivers are bordering the municipality, viz. Hanumante and Manahara, the former is the main drainage river. This river is much polluted compared to Manahara river.

The core area of Thimi and Bode are covered with drains constructed with the support of PLAN Nepal about a decade ago. The municipality has added some length as per the local demand. In other areas, many drains were constructed with community participation. Nepal Water Supply Corporation and district office of Department of Water Supply and Sewerage have limited investment in the sector.



Temporary stone covering the manhole.



Raw sewage discharging into river.

The municipality is spending considerable amount of its budget in constructing waste water drains. However, most of the drains were poorly designed and constructed. All drains constructed in the municipality was physically measured, studied the condition of the drains at present and identified the problems in the system including their capacities and command areas. Details of these findings are presented in the waste water management plan.

Considering the physical parameters, municipal capabilities: both in terms of management and investments; alternatives have been developed for waste water management at feasibility level. Finalisation of the study is not possible due to the absence of governing body in the municipality. As agreed with the CEO Mr. Gautam, subsequent establishment of municipal board after the establishment of interim government at central level, the interaction with the municipal board will be done. Thus this activity is waiting for the formation of above mentioned board in the municipality.

2. Stakeholder meetings

Stakeholder meetings were proposed to own and manage waste water management system by the municipality and its stakeholders. It was expected that these meetings will be instrumental in adapting necessary policies in waste water management. Two types of stakeholder meetings were envisaged; viz. political and social stakeholders and technical stakeholders.

Implementation

Before starting the survey of existing situation of the waste water management in Madhyapur Thimi Municipality, a meeting was organised to make the political representatives of the major parties of the municipal area was organised on June 5, 2006. The meeting was participated by ex-mayor, representatives of various parties, CEO and technical and community staff of the municipality. UN HABITAT CTA Dr. Roshan Shrestha also participated in the meeting.



Workshop participants discussing waste water management issues.



Taking part in the discussions.

During this interaction meeting, participants were explained about the project and its activities. Suggestions of the participants were noted for further activities.

Second interactive meeting was organised on July 5, 2006 among the various technical experts in the waste water management sector in Hotel Himalaya. This one day interactive workshop was attended by government organisation representatives, university professors, experts in the field, municipal engineers, private sector, etc. The main purpose of the workshop was to discuss the various aspects of sustainable waste water management issues in urban areas of Nepal and find alternatives.

Participants of the workshop

	Name	Organisation
1	Dr. Roshan Raj Shrestha	CTA, UNHABITAT
2	Mr. Kabir Das Rajbhandari	Programme officer, Urban Programme, Water Aid Nepal
3	Mr. Bhusan Tuladhar	ENPHO
4	Mr. Mohan Krishna Prajapati	Nepal Engineering College, Pokhara University
5	Prof. Dr. Bhagwan Ratna Kansakar	Professor, Institute of Engineering, Tribhuvan University
6	Mr. Iswar Man Amatya	Associate Prof. Institute of Engineering, Tribhuvan University
7	Mr. Mahesh Bhattarai,	Lecturer, Institute of Engineering, Tribhuvan University
8	Mr. Satya Narayan Sah	Engineer, Madhyapur Thimi Municipality
9	Mr. Madan Sunder Shrestha	Engineer, Madhyapur Thimi Engineering Society
10	Mr. Pradeep Gautam	Engineer, Kathmandu Metropolitan City
11	Mr. Rudra Prasad Gautam	Senior Engineer, Lalitpur Sub-metropolitan City
11	Mr. Laxman Kisiju	Engineer, Bhaktapur Municipality
12	Mr. Balkrishna Maharjan,	Engineer, Kirtipur Municipality
13	Mr. Nava Raj Khatri	Engineer, Department of Water Supply & Sewerage, GoN
14	Mr. Jyoti Bhushan Pradhan,	Kathmandu Div., Dept of Water Supply & Sewerage, GoN
15	Mr. Ram Deep Sah,	Kathmandu Div., Dept of Water Supply & Sewerage, GoN
16	Mr. Rajendra Pradhananga,	UDLE/ GTZ
17	Mr. Gyanesh Bajracharya,	Manager, Nepal Water Supply Corporation
18	Mr. Suresh Shrestha,	Geo Spatial System Pvt. Ltd
19	Mr. Kishor Shakya,	Chief, CWSSP, DWSS, GoN /ADB
20	Mr. Girija Prasad Gorkhaly	Chief, Urban Environment Improvement Project, GoN/ADB
21	Mr. Sirish Singh	Ph D std.
22	Mr. Bharat Sharma	CIUD
23	Mr. Bipin Chitrakar	ASTRA Development Networks Pvt. Ltd
24	Mr. Padma Sunder Joshi	CIUD
25	Dr. Kabita Bade Shrestha	CIUD
27	Mr. Anup Phaiju	CIUD
28	Mr. Subash Shrestha	CIUD

Suggestions received in the discussion

- Suggested to provide different system for core city and extended area of the city. For the city core water carriage system would be appropriate where as extended areas may be serviced with decentralised waste water management system.
- Capacity building of on various aspects of waste water management
 - Municipal technicians
 - Engineering professionals
 - Local masons
- Awareness building of community on importance of waste water management and make them aware for their responsibilities in waste water management
- It is important to distinguish which part of the waste water is private goods and public goods so that the responsibilities can be shared accordingly.
- Water and sanitation policy should give adequate attention to waste water management.
- Oxidation ponds are one of the better solutions in our context.
- Research and Development required
- Explore application of new technologies
- Optimise designs of existing technologies
- Scaling up the technologies
- Learn from the experience of neighbouring countries
- Land development projects like land pooling should incorporate necessary waste water management system.
- Decentralised waste water treatment system where septic tank and soap pits are constructed may not be suitable for the areas fetching ground water.
- Municipalities should take the strategy of allocating land parcels for waste water treatment plants before it is late.
- Adopt community level septic tanks followed by constructed wetlands in housing colonies.
- Authentic body should be formed to regulate waste water management.
- Let us not try to avoid electro-mechanical units in all conditions. When cities become larger and availability of land become difficult, municipalities may need to go for more mechanised systems.
- System should address existing waste water management practices like support to manage faecal sludge from

- Identify land not only from technical but social view point as well.
- Sewer networks should be distributed so that the waste water may be treated in small units.
- Combination of wetland with other technologies to increase efficiency.
- Grey water management may be dealt separately to reduce waste water load.
- Prepare design of a complete package of faecal sludge management so that the initiative will be complete and can be replicated in other areas as well.
- Prepare IEC materials to promote proper waste water management

3. Trainings

Several trainings are proposed in the project to train municipal technical staff. Moreover, to bring synergy effects, technical staff of other municipalities of the valley will also be invited in the training. Not limiting to technical staff, trainings will also be organised to train ward level staff of the municipality and municipal decision makers of all the municipalities of the valley. However, this activity will be followed after the finalisation of the waste water management plan of Madhyapur Thimi Municipality.