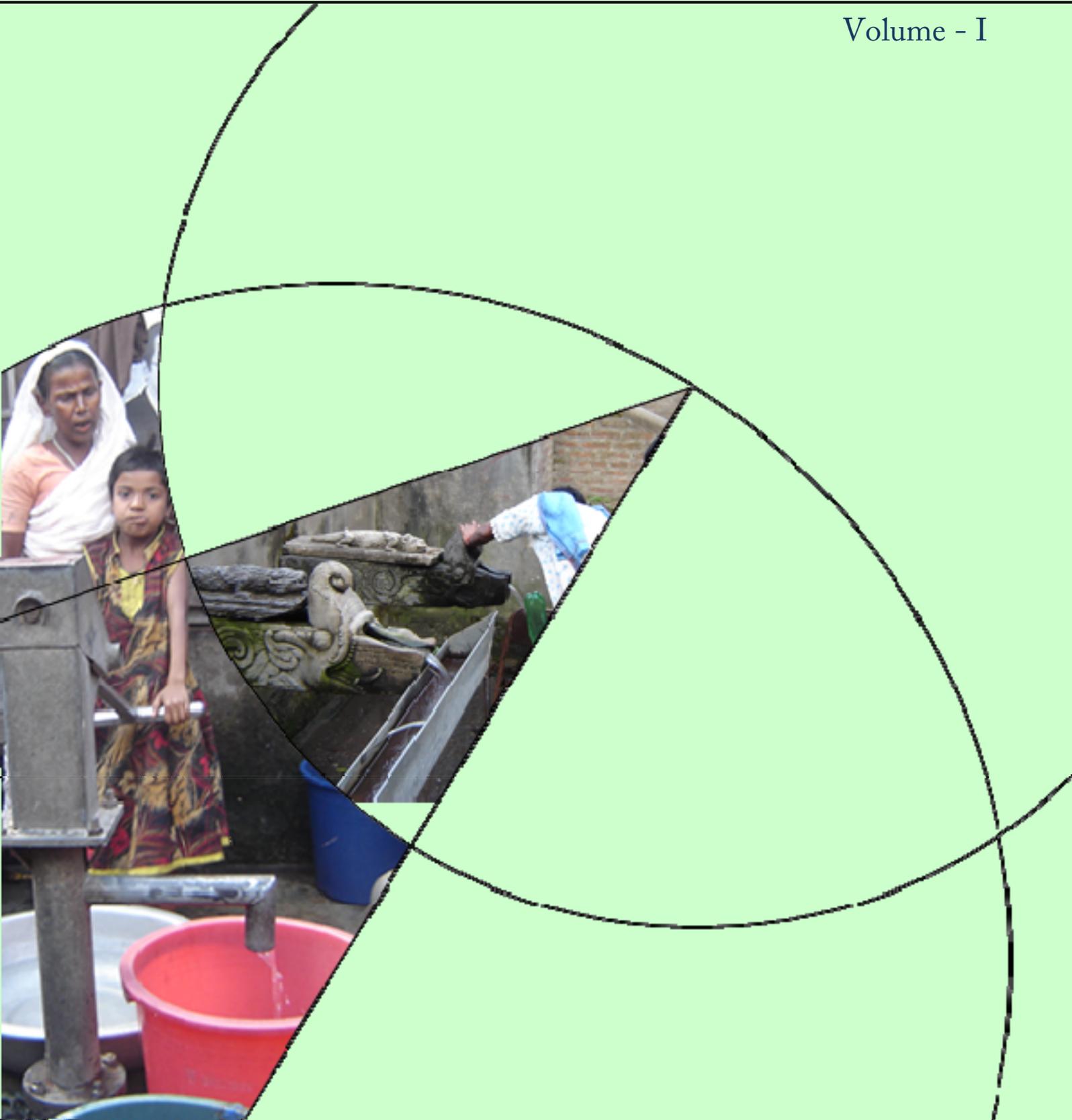


# Capacity Building for Enhancing Local Participation in Water Supply and Sanitation Interventions in Poor Urban Areas

Volume - I





**Capacity Building for Enhancing Local Participation  
in Water Supply and Sanitation Interventions in  
Poor Urban Areas**

Volume - I

**Development Research Institute (IVO)  
Institut de Ciència i Tecnologia Ambientals (ICTA)  
International Training Network Centre, BUET (ITN-BUET)  
Central Department of Economics (CEDECON)**

**Capacity Building for Enhancing Local Participation in Water Supply and Sanitation Interventions in Poor Urban Areas, Volume - I**

**Development Research Institute (IVO)**

P.O. Box 90153, 5000 LE Tilburg

The Netherlands

**Institut de Ciència i Tecnologia Ambientals (ICTA)**

Universitat Autònoma de Barcelona

Facultat de Ciències, torre 5, 4a planta, Bellaterra 08193

Spain

**International Training Network Centre, BUET (ITN-BUET)**

Centre for Water Supply and Waste Management

Civil Engineering Building (3rd floor)

BUET, Dhaka-1000

Bangladesh

**Central Department of Economics (CEDECON)**

Tribhuvan University

Kirtipur, Kathmandu

Nepal

February 2008

All rights reserved by

IVO, ICTA, ITN-BUET, CEDECON

This publication or any part of it cannot be reproduced in any form without permission of the publisher.

## **ACKNOWLEDGEMENTS**

This book has been developed with the support of the European Commission under the project “Capacity Building for Enhancing Local Participation in Water Supply and Sanitation Interventions in Poor Urban Areas” (grant contract ASIA/PRO ECO/BD/2005/109993), EU-Asia Pro Eco Programme, Phase II. The project was jointly implemented by four partner universities: Development Research Institute (IVO), University of Tilburg, The Netherlands; International Training Network Centre (ITN), BUET, Bangladesh; Central Department of Economics (CEDECON), Tribhuvan University, Nepal and Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona, Spain. We are very grateful to all the members of the teams from ITN-BUET and CEDECON that conducted and facilitated fieldwork in Bangladesh and Nepal. We indebted to local stakeholders who provided very valuable information.

## **EXECUTIVE SUMMARY**

Meeting the Millennium Development Goal of halving, by 2015, the proportion of people without sustainable access to safe drinking water supply and sanitation (WSS) encompasses significant challenges for poor communities, local governments and implementing agencies worldwide. Even though there is not a consensus about the estimation of the financial gap for achieving the goal, it is clear that a huge amount of additional resources are needed, particularly in the so called least developed countries. The problem of how to finance WSS interventions to cover the ever increasing demand is particularly acute in Africa, due to low coverage and high levels of poverty, and in Asian countries, due to high rates of urban growth. Financing water and sanitation interventions in developing countries is facing serious difficulties, in part due to a) scarce local public resources; b) insufficient international aid; c) the fact that foreign private investment in the water sector represents a small share of total foreign direct investment (FDI) in developing countries and d) the fact that provision of water and sanitation among the poor is considered as very risky by private investors, both local and foreign.

This context, characterized by public inability and private (commercial sector) reluctance to invest in WSS, constitutes a significant challenge for growing urban poor communities worldwide since there is no doubt about the great benefits these communities may reap from investment in WSS. The human development cost of water supply and sanitation related problems is enormous. Some of such costs, as the Human Development Report 2006 points out, are estimated as follows: (i) 1.8 million child deaths each year as a result of diarrhea, (ii) loss of 443 million school days every year from water related illness, (iii) about half of population of developing countries suffering at any given time from water and sanitation related diseases, and (iv) millions of women spending several hours a day fetching water. Nevertheless, water and sanitation sector suffer from chronic under-funding (UNDP, 2006). The burden of this deficit is normally disproportionately allocated to the poorest in urban areas (Kayaga and Franceys, 2007), who end up paying water tariffs (usually to ambulant vendors) considerably higher than better-off households, and additionally are more prone to suffer from sanitation-related diseases due to the often unhygienic conditions of slums.

Nonetheless, the evidence shows that poor people are indeed very willing to invest in safe water supply and sanitation services (though they may be more able to do so through organization/labor/materials than with cash), which is not surprising since their livelihoods are very dependent on these services. Participatory approaches in the WSS sector were developed during the early 1990s, after realizing the flaws of the top-down and supply driven approach implemented in previous decades. Community participation, management and empowerment may mean a substantial shift in the distribution of the cost burden of implementing WSS systems, and therefore it should increase the chances of their execution. Besides, WSS interventions have a higher chance to be sustainable if they involve local populations in the conceptualization, design and implementation stages of the project cycle. Therefore, in order to be efficient and achieve a long lifespan, WSS projects should involve investment not only in hardware (technology, infrastructure, etc.) but also in software at the local level (local social organization, management and empowerment).

The overall objective of this book is to improve the knowledge and skills of urban stakeholders for designing and managing water supply and sanitation (WSS) projects involving community participation in poor urban areas. The book aims to improve local capacity to develop and implement appropriate urban environmental policies, system of governance or techniques for enhancing community involvement in WSS interventions, with particular emphasis on innovative financial mechanisms and inter-sector partnerships facilitating participation by local communities. The book is derived from an extensive field research conducted in 2007/08

under the support of the Asia Pro Eco Programme of the European Commission. Lessons were drawn from 20 case studies in Bangladesh and Nepal.

We have found that bilateral and multiple partnerships between donors, national and local agencies, government institutions and the local communities may play a very critical role in enabling and facilitating local participation. Except for Alook Hiti scheme (Nepal), all projects revised in this book were sponsored by a foreign institution or donor. The nature of the donor involved in each intervention depends very much upon the scheme size and the targeted community. In many cases in Bangladesh, for example, the interaction between the mediating NGO and the water provision governmental body has been crucial for gaining water access to very poor urban settlements, which usually before the intervention were not entitled to public water facilities and had to afford to buy water at an extremely high fee. Users committee may face serious constraints (as political conflicts and lack of interest to participate) to manage by their own a water provision and sanitation system. However, if the correct incentives and institutional framework are in place, we have noted these committees may be quite efficient in the use of resources and effective in achieving the goals of the intervention. This book draws some lessons about the conditions that make more likely a fruitful work of users committees. Interestingly enough, networking among users committees from different schemes was observed in two of the case studies. In Surkhet (Nepal) and Old Zimkhana (Bangladesh), a top institution was bringing together users committees from neighboring schemes. With this clever initiative, the individual committees could join efforts and gain strength and influence.

The role of the local community in the design, planning and implementation phases has been more significant in small schemes. Along with communities, national and/or local NGOs frequently act as main implementers in small projects. The NGO is meant to act as a facilitator and the community is expected to become the manager of the scheme. In all the assessed case studies, the intervention is initiated with an awareness campaign in order to create demand for the new services and change prevalent hygiene and health practices. The ignition phase was of utmost importance in Bashbaria (Bangladesh) and IG Gate slum (Bangladesh) where the facilitating agencies were adopting the popular Community Led Total Sanitation (CLTS) approach. Under this approach, communities are only provided with software support to achieve the goal of total sanitation and therefore, a very high community involvement is expected.

Participation of women was found rather high in most case studies. Even though females were found not very active in some cases, in other cases, mainly in small communities, female representatives were majority and they were participating very actively. In fact, some committees incorporate provisions for the reservation of at least one third of the committee seats to female members. However, it is still usual to find that the top positions of the users committee are occupied by male representatives like in Baganbari (Bangladesh) or Alook Hiti (Nepal) case studies.

We have noted that interventions tend to be more successful when the community people is able to select the technological option that better responds to their needs, particularly in relation to affordability and the operation and maintenance requirements. The Alook Hiti case study (Nepal) shows how community is capable to find very smart and inexpensive solutions to alleviate their water problems. The Alook Hiti system, which stores free flowing water from a traditional stone spout, is being replicated in other areas of the same town. Installing the same system in other stone spouts of Kathmandu Valley could potentially contribute to resolve the water scarcity scenario of thousands of households in the area. Alternatively, in the slum areas of Bangladesh, cluster latrines and community water points are mostly installed to face the lack of space and the limited affordability of the beneficiaries. Offering a wide range of technological options and extensively informing community about cost and main advantages and shortcomings ensures a decision making process

fully led by community members. Procurement and availability of materials is also a key issue of sustainable water supply and sanitation interventions. In Ilam (Nepal), the use of materials not available in the country to construct the system made repairs very costly and time-consuming which could compromise the well functioning of the system. That is to say that technological dependence with the donor may bring about very negative impacts and therefore, it should be avoided. Similarly, the use of good quality materials was seen to favour less break downs and therefore, the sustainability of the system in Damak (Nepal).

Our results show that communities are more likely to assume operation and maintenance responsibilities effectively, when their ownership feeling is properly developed. Accordingly, it is important to promote active involvement of community in all the stages of the project, i.e. in planning, development, implementation and post implementation phases. With the same purpose, beneficiaries are frequently asked to contribute part of the capital cost. One clear example of such arrangement is found in the slum areas of Bangladesh, where the main aim of the capital cost sharing strategy adopted by the facilitating agencies is to enhance ownership feeling rather than to decrease the cost of the intervention.

In relation to financial issues, it is quite remarkable the high level of local contribution that has been achieved in several of the cases we have analyzed. This shows that cost sharing in poor urban localities is both feasible and effective. We have found that flexibility and tailoring have been two critical factors for enhancing local participation and contribution. Flexibility with regards payments of the fee by different households, the allocation of subsidies and the options for contributing are also key tools for inclusion of the most vulnerable groups. Furthermore, a combination of financial penalties and incentives have shown to be very effective in promoting an efficient use of resources and participation of local dwellers.

Nonetheless, community participation in WSS interventions is far from being an easy and smooth process, but rather to plan and manage it needs considerable efforts. As well, the systematization of factors that facilitate and inhibit participation becomes a key input for improving the performance of the WSS scheme. This book aims to contribute to build such systematization. Despite the problems identified, the 20 case studies we have analyzed shed a rather optimistic picture about the role community participation may play in enhancing the effectiveness and sustainability of WSS interventions in poor urban areas.

## Table of Contents

ACKNOWLEDGEMENTS .....	III
EXECUTIVE SUMMARY .....	IV
LIST OF TABLES .....	X
LIST OF FIGURES .....	XI
<b>CHAPTER 1 .....</b>	<b>1</b>
INTRODUCTION.....	1
1.1 <i>Background</i> .....	1
1.2 <i>Purpose of the document</i> .....	5
1.3 <i>Scope of the document</i> .....	5
1.4 <i>Organization of the document</i> .....	8
<b>CHAPTER 2 .....</b>	<b>11</b>
COMMUNITY PARTICIPATION FOR SUSTAINABLE DEVELOPMENT OF WATER SUPPLY & SANITATION .....	11
2.1 <i>Introduction</i> .....	11
2.2 <i>Community Participation in Various Approaches of WSS Interventions</i> .....	14
2.2.1 Top-down approach .....	14
2.2.2 Bottom up approach .....	15
2.3 <i>Participatory Tools and Techniques</i> .....	21
2.3.1 Tools commonly used for community participation.....	21
2.3.2 Strengths and Weaknesses of Participatory approach.....	26
2.3.3 Challenges for participatory approach to ensure sustainability.....	26
2.4 <i>Factors Influencing Community Participation</i> .....	27
2.4.1 Role of Implementing /support organization .....	27
2.4.2 Recognition of CBOs .....	28
2.4.3 Availability of low cost technology .....	28
2.4.4 Fulfilment of basic needs .....	28
2.5 <i>Community Management of WSS Interventions</i> .....	29
2.5.1 Project Cycle in the context of WSS interventions .....	30
2.5.2 Community participation in conceptualization, formulation, planning and design .....	31
2.5.3 Community participation in implementation.....	32
2.5.4 Community participation in O&M, monitoring, reporting and evaluation.....	32
2.6 <i>Gender Aspects in WSS</i> .....	33
2.6.1 What is Gender .....	33
2.6.2 Gender Approach .....	33
2.6.3 Constraints in Women Participation .....	33
2.6.4 Gender issues in Water .....	34
2.6.5 Gender issues in Sanitation .....	34
2.6.6 Overcoming the Gender issues .....	35
<b>CHAPTER 3 .....</b>	<b>37</b>
INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTING COMMUNITY BASED WSS INTERVENTION .....	37
3.1 <i>Introduction</i> .....	37
3.2 <i>Existing Institutional Arrangement</i> .....	37
3.2.1 Formation and functions of Community Based Organizations (CBOs) .....	38
3.2.2 Development of Management Committees.....	42

3.3	<i>Capacity building on WSS</i> .....	47
3.3.1	Awareness building on WSS.....	48
3.3.2	Community based capacity building tools.....	50
3.3.3	Factors influencing in awareness building.....	51
3.4	<i>Factors Impeding Institutional Development Process</i> .....	53
3.4.1	Local political manipulation .....	53
3.4.2	Interference of invisible power .....	54
3.4.3	Socio-economic conflicts.....	56
3.5	<i>Multi-stakeholders' Partnerships</i> .....	59
3.5.1	Involvement of Development Partners .....	59
3.5.2	Involvement of project implementing agencies:.....	61
3.5.3	Type of Agreement.....	63
<b>CHAPTER 4</b>	<b>.....</b>	<b>67</b>
	FINANCIAL MECHANISMS FOR THE DESIGN AND MANAGEMENT OF WATER SUPPLY AND SANITATION INTERVENTIONS .....	67
4.1	<i>Introduction</i> .....	67
4.2	<i>Financing the MDGs on Drinking Water and Sanitation: Resource Requirements at Global and Regional Levels</i> .....	69
4.3	<i>Changing Role of Government</i> .....	71
4.4	<i>Water Insecurity and Access of Water to the Poor</i> .....	71
4.5	<i>Design of Tariff Structure</i> .....	73
4.5.1	Health consideration .....	74
4.5.2	Administrative consideration .....	74
4.5.3	Institutional consideration .....	74
4.5.4	Financial consideration .....	75
4.5.5	Equity Consideration .....	77
4.6	<i>Tariff Structure: Some Basic Practices in Nepal and Bangladesh</i> .....	80
4.7	<i>Local Financing Mechanisms for Water Supply and Sanitation</i> .....	82
4.7.1	National Strategy for fund mobilisation .....	83
4.7.2	Partnership between donors, local body and the community .....	84
4.7.3	Partnership between NGO, local body and community.....	85
4.7.4	NGO as intermediary/implementer between the community and water-related organizations.....	85
4.7.5	Local body and community partnership.....	87
4.7.6	Pooled resources and revolving fund for water supply and sanitation .....	87
<b>CHAPTER 5</b>	<b>.....</b>	<b>89</b>
	COMMUNITY BASED LOW-COST WSS TECHNOLOGIES .....	89
5.1	<i>Introduction</i> .....	89
5.2	<i>Different Community Based Water Supply Options</i> .....	89
5.2.1	Tubewell Technology.....	90
5.2.2	Rain Water Harvesting System .....	93
5.2.3	Urban Water Point .....	95
5.2.4	Urban Stand Post.....	96
5.2.5	Community Based Gravity Fed Water Supply System .....	96
5.3	<i>Different Community Based Sanitation Systems</i> .....	98
5.3.1	Pit Latrine .....	99
5.3.2	Pour-flash Sanitation Technologies.....	101
5.3.3	Communal Sanitation System .....	104
5.4	<i>Selection Criteria for WSS Technologies</i> .....	107
5.4.1	Selection criteria for Water supply options.....	107
5.4.2	Selection Criteria for Sanitation Technologies .....	108

5.5	<i>Operation &amp; Maintenance of Different WSS Technologies</i> .....	108
5.5.1	<i>Operation &amp; Maintenance of Different Water Supply Options</i> .....	109
5.5.2	<i>Operation &amp; Maintenance of Different Sanitation Technologies</i> .....	110
<b>CHAPTER 6</b>	.....	<b>113</b>
CONCLUSION	.....	113
6.1	<i>Multiple Roles and Responsibilities of Community and Other Stakeholders</i> .....	113
6.2	<i>Financial Arrangements Favoring Effective Participation of the Poor</i> .....	115
6.3	<i>The Critical Role of Technology in Community Led Interventions</i> .....	116
6.4	<i>Ensuring Long Term Sustainability of Community Led Interventions</i> .....	116
REFERENCES	.....	129

## **LIST OF TABLES**

TABLE 1-1: BRIEF DESCRIPTION OF THE NEPALESE CASE STUDIES. ....	6
TABLE 1-2: BRIEF DESCRIPTION OF THE BANGLADESHI CASE STUDIES. ....	7
TABLE 2-1: SAMPLE CHECKLIST OF USES FOR WATER AND RELEVANT REQUIREMENTS .....	16
TABLE 2-2: STRENGTHS AND WEAKNESSES OF PARTICIPATORY APPROACH .....	26
TABLE 2-3: SPECIFIC ISSUES PERTAINING TO WOMEN PARTICIPATION RELATED TO WATER SUPPLY PROJECTS.....	34
TABLE 3-1: ROLE OF THE STAKEHOLDERS .....	47
TABLE 3-2: ROLE OF DIFFERENT STAKEHOLDERS .....	63
TABLE 4-1: DESIGN OF TARIFF IN THE 10 WATER SUPPLY SYSTEMS, NEPAL.....	78
TABLE 4-2: WATER TARIFF STRUCTURES OF PRIVATE CONNECTIONS AND STAND PIPES.....	80
TABLE 4-3: WATER TARIFF IN 12 WATER SUPPLY SYSTEMS, NEPAL, 2007.....	80
TABLE 4-4: CAPITAL COST SHARING MECHANISM, 10 CASE STUDIES, NEPAL, 2007 .....	83
TABLE 4-5: KHAIRENITAR SMALL TOWN WATER SUPPLY AND SANITATION PROJECT: COST SHARING ARRANGEMENTS.....	88
TABLE 5-1: ADVANTAGES AND DISADVANTAGES OF NO. 6 HANDPUMP .....	91
TABLE 5-2: ADVANTAGES AND DISADVANTAGES OF TARA HANDPUMP .....	93
TABLE 5-3: ADVANTAGES AND DISADVANTAGES OF DEEP-SET TUBEWELL .....	93
TABLE 5-4: ADVANTAGES AND DISADVANTAGES OF RAINWATER COLLECTION SYSTEM .....	95
TABLE 5-5: ADVANTAGES AND DISADVANTAGES OF POUR-FLUSH SANITATION TECHNOLOGIES.....	101
TABLE 5-6: ADVANTAGES AND DISADVANTAGES OF POUR-FLUSH SANITATION TECHNOLOGIES.....	103
TABLE 5-7: ADVANTAGES AND DISADVANTAGES OF COMMUNAL SANITATION .....	106
TABLE 6-1: SUMMARY OF KEY LESSONS AND BEST PRACTICES OF THE CASE STUDIES FROM NEPAL .....	119

## LIST OF FIGURES

FIGURE 2-1: VILLAGE MAP PREPARED BY A GROUP OF MEN AND WOMEN.....	23
FIGURE 2-2: POCKET CHART ON DIFFERENT SOURCES OF WATER.....	24
FIGURE 2-3: MATRIX RANKING.....	25
FIGURE 2-4: PROJECT CYCLE IN THE CONTEXT OF WSS INTERVENTIONS .....	30
FIGURE 3-1: TWO TIER COMMUNITY BASED MANAGEMENT SYSTEM .....	43
FIGURE 3-2: STAKEHOLDERS' MAP AND THEIR INTERACTIONS (EXAMPLE B-07).....	65
FIGURE 3-3: STAKEHOLDER'S MAP AND THEIR INTERACTIONS (EXAMPLE N-02).....	66
FIGURE 5-1: THE MAIN AQUIFERS AND WELL FOR WATER SUPPLY .....	90
FIGURE 5-2: NO. 6 HAND PUMP TUBE WELL .....	91
FIGURE 5-3: TARA HAND PUMP .....	92
FIGURE 5-4: DIAGRAM OF A TYPICAL RWHS .....	94
FIGURE 5-5: PRACTICE OF RWHS IN STAKUNDO, CHITTAGONG, BANGLADESH.....	94
FIGURE 5-6: URBAN WATER POINT WITH RESERVOIR .....	95
FIGURE 5-7: URBAN STAND POST.....	96
FIGURE 5-8: GRAVITY FED WATER SUPPLY SYSTEM (SHREENAGAR, NEPAL).....	97
FIGURE 5-9: COMMUNITY BASED WATER SUPPLY USING DTW THROUGH TAPS .....	97
FIGURE 5-10: COMMUNITY MANAGED WATER SUPPLY FROM STONE SPOUT (ALOK HITI, NEPAL).....	98
FIGURE 5-11: SIMPLE/DIRECT PIT LATRINE.....	99
FIGURE 5-12: OFF SET PIT LATRINE.....	99
FIGURE 5-13: VENTILATED IMPROVED PIT LATRINES (VIP) .....	100
FIGURE 5-14: POUR FLASH LATRINE .....	102
FIGURE 5-15: WATER SEAL .....	102
FIGURE 5-16: POUR FLASH LATRINES .....	103
FIGURE 5-17: PLAN OF A SANITATION BLOCK.....	105
FIGURE 5-18: VARIOUS COMPONENTS OF A SEPTIC TANK.....	106
FIGURE 5-19: ECOLOGICAL SANITATION (KHOKNA, NEPAL) .....	106

## **Abbreviations and Acronyms**

ADB	Asian Development Bank
AIC	Average Incremental Cost
ARBAN	Association for Realisation of Basic Needs
BOT	Build-Operate-Transfer
CAP	Community Action Plan
CBO	Community Based Organization
CDC	Community Development Committee
CHP	Community Health Promoter
CL	Cluster Latrine
CMC	Community Management Committee
DCC	Dhaka City Corporation
DDA	Demand Driven Approach
DPHE	Department of Public Health and Engineering
DRA	Demand Responsive Approach
DSK	Dushtha Sashthya Kendra
DTW	Deep Tube well
DWASA	Dhaka Water Supply and Sewerage Authority
DWSS	Department of Water Supply and Sewerage
DWSSUC	Damak Water Supply and Sanitation Users Committee
ECOSAN	Ecological Sanitation
ENPHO	Environment and Public Health Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GNI	Gross National Income
GoB	Government of Bangladesh
GoN	Government of Nepal
GTZ	German Agency for Technical Cooperation
HDR	Human Development Report
INGOs	International Non Government Organizations
JICA	Japan International Cooperation Agency
KVWSMB	Kathmandu Valley Water Supply Management Board
LGED	Local Government Engineering Department
LWF	Luthern World Federation
MDGs	Millennium Development Goals
MoU	Memorandum of Understanding
NEWAH	Nepal Water for Health
NGOs	Non Government Organizations
NPC	National Planning Commission
NRs	Nepali Rupees

NWSC	Nepal Water Supply Corporation
PC	Purchase Committee
PIC	Project Implementing Committee
PNGO	Partner NGO
PPP	Perspective Planning Process
PPPs	Public Private Partnerships
PRA	Participatory Rapid Appraisal
PSP	Private Sector Participation
PSTC	Population Services and Training Centre
PVC	Poly Vinyl Chloride
RWHS	Rain Water Harvesting System
SDC	Slum Development Committee
SMC	Sanitation Management Committee
SOs	Support Organizations
STWSSSP	Small Town Water Supply and Sanitation Sector Project
TDF	Town Development Fund
UDC	Urban Development Center
UK	United Kingdom
UMP	Urban Management Programme
UN	United Nations
UNDP	United Nations Development Programme
Unicef	United Nations Children's
UWP	Urban Water Point
VERC	Village Education Resource Centre
VIP	Ventilated Improved Pit
WAC	WatSan Action Committee
WatSan	Water and Sanitation
WSS	Water Supply and Sanitation
WSSDO	Water Supply and Sanitation Sub Divisional Office
WSSUC	Water Supply and Sanitation Users Committee
WUC	Working Users Committee



# Chapter 1

## INTRODUCTION

### 1.1 Background

The importance of water and sanitation has sufficiently been underlined in recent literature including the Global Human Development Report 2006 which has the theme: *Beyond Scarcity: Power, Poverty and Global Water Crisis*. The report holds the view that water crisis is holding back human progress, consigning large segments of humanity to lives of poverty, vulnerability and insecurity. This crisis claims more lives through diseases than any war claims through guns. Thus, the report views that overcoming the crisis in water and sanitation is one of the great human development challenges of the early 21<sup>st</sup> century (UNDP, 2006, p. 1).

Water is required for both the life and the livelihoods. It is life for people and the planet. It is essential to the well-being of humankind, to the economic development, and more importantly for the healthy functioning of the world's ecosystem. Life expectancy of a country significantly increases when there is safe water with adequate sanitation. Delivering clean water, removing waste water and providing sanitation are three of the most basic foundations for human progress.

Because of its critical role, several international conferences were held focusing on water and sanitation. The first one was the Mar del Plata United Nations Conference on Water held in 1977, which was the first intergovernmental conference devoted to water. The conference prepared a Plan of Action, based on which the United Nations General Assembly in 1980 proclaimed the period 1981 – 90 as the international drinking water and sanitation decade. Since then several other international and regional gatherings were held including Earth

Summit in 1992, the millennium Declaration of September 2000, and the World Summit on Sustainable Development (WSSD) in 2002. The WSSD recognised that water and sanitation is inextricably linked to the eradication of poverty and attainment of the sustainable development. In fact, water was identified by the then UN Secretary General as one of the five specific “WEHAB” areas (water, energy, health, agriculture and biodiversity) in which concrete results are both essential and achievable.

The WSSD reiterated the MDG of halving by 2015 the proportion of people who are unable to reach or to afford safe drinking water and to set a new target on halving the proportion of people who do not have sustainable access to basic sanitation. Thus, the sanitation objective is now an integral part of target 10 of the MDGs. Since 2002, further international deliberations on water and sanitation have helped advance cooperation and action in the area.

In spite of such a critical role that the water and sanitation plays in every day human lives and that so many deliberations held for providing drinking water and sanitation, still about 1.1 billion people in developing countries have inadequate access to water and some 2.6 billion – half of the developing countries’ population - lack basic sanitation.

Despite the fact that South Asia has a better availability of water compared to many other parts of the worlds, it has about 234 million people without access to improved drinking water resources and 938 million people without improved sanitation (WHO & UNICEF, 2004). Thus, the twin deficits in water and sanitation are rooted in institutional and political choices, not in water’s availability that is overall message of the HDR 2006 - that the scarcity at the heart of the global water crisis is rooted in power, poverty and inequality, not in physical availability (UNDP, 2006, p. 2).

South Asia seems to be on track to meet the Millennium Development Goal (MDG) for water supply but not to that for sanitation. This is partially due to the low priority given to sanitation at international, national and local levels (Paterson et al, 2007). Sanitation coverage in South Asia should be increased from 37% in 2002 up to 60% by 2015 to meet the MDGs (WHO&UNICEF, 2004), which is a challenging task given the fact that it is given low priority.

In an attempt to accelerate the adequate access for sanitation, the first South Asian Conference on Sanitation (SACOSAN) was held in Dhaka in 2003. The event brought together governments and main concerned stakeholders and more importantly made a declaration that binds the governments to make an effort to advance sanitation in their respective countries through a people-centred, community-led, gender-sensitive and demand-driven strategy (WA, 2006).

According to the Joint Monitoring Programme (WHO & UNICEF, 2004), access to improved drinking water resources in Bangladesh and Nepal in 2002 was 84% and 75%, respectively; and improved sanitation coverage was 27% in Nepal and 48% in Bangladesh. Both countries seem to be on track to meet the MDG of drinking water and sanitation. However, it is a formidable task to attain the full coverage in view of the fact that the incremental cost of water goes on increasing because the cheaper options have already been exploited. This is a further challenge for developing poor countries like Bangladesh and Nepal which lack resources. Similarly, attaining full coverage of sanitation is very difficult though not impossible because of the low priority given to sanitation not only by the government but also by the people of poor developing countries, and increasing difficulty and cost to persuade additional population for installing sanitation facilities.

However, the burden of poor service delivery is disproportionate; generally poor suffer more than the better off population. In fact, the urban poor are most frequently among the un-served households. Because of the poverty and inequality and power structures, the poor lack adequate access to water and sanitation, and pay more than what their rich counterparts pay. In deed some of the poorest people living in urban slums pay some of the world's highest prices for water. For example, in Jakarta, Lima, Manila and Nairobi households living slums and low income settlements typically pay 5 to 10 times more for their water than high income residents of the same city (UNDP, 2006, p. 52). The slum population of Dhaka pays more than twenty times compared to the ones who are connected with the Dhaka Water and Sewerage Authority (DWASA).

In South Asia, urban poor are growing at high rates due to migration from rural to urban areas and rapid population growth. Urban growth is estimated at about 2,8% during the period 2000-2015 in South Central Asia, resulting in more than 50% of the South Central Asians living in urban areas by 2015 (UN Population Division, 2007). Newcomers are often compelled to occupy illegally or unofficially the outskirts of the city where no municipal services are available. Inadequate water supply and sanitation access, along with high population density pose a major risk for public health and the environment. In Bangladesh and above all in the capital, slum population is growing at exorbitant rate. Only in Dhaka Metropolitan Area (DMA) around 3.4 million people reside in slum areas, which are 37.4% of Dhaka population (CUS, 2005).

Most slum areas in Bangladesh suffer from very deficient sanitary conditions as water supply and sanitation access is very precarious; and polluted water bodies surround the high densely populated suburbs. Furthermore, eviction threatens the permanence of the settlements discouraging slum dwellers to invest in water supply and sanitation improvements. According to the Slum Mapping and Census, 2005, 61.1% of the slum clusters use municipal taps as their drinking water source, 37% use tube wells and 1.9% uses other sources such as rivers, ponds, lakes and canals. In most part of the clusters (95.6%), slums dwellers are compelled to share the available drinking water sources with other households. Among those clusters with municipal taps, 34.9% share the facility with more than 10 households and almost half of the clusters with tube wells; also share the facility with more than 10 households.

In Nepal influx of population from remote and rural areas to urban and peri-urban areas has also been continuous during past years. This trend has been aggravated by the internal conflict agitating the country since 1996. Many families living in areas affected by the insurgency have migrated from villages to urban settlements. This has increased the pressure on the existing limited urban infrastructures including drinking water and sanitation. However, Nepali slum or squatter population is not as large as in Bangladesh, with approximately 15,000 people living in slum or squatter settlements (Lumanti *et al*, 2000). Many poor peri-urban communities in Nepal fetch drinking water from traditional stone spouts managed by community. Household connections, public standpipes and yard tap-stands provided by the government are also found within slum settlements in Nepal. Thus, despite the lack of legal entitlement, government services reach the squatter settlements in Nepal (Lumanti *et al*, 2000). Compared to drinking water, sanitation condition of slum dwellers is much poorer, as only about one third of slum or squatter dwellers have access to a toilet no matter of what quality, and only half of these are considered sanitary (Lumanti *et al*, 2000).

In low income countries like Nepal and Bangladesh, governments have limited capacity to deliver sustainable services to community due to lack of resources and ineffective management. Old and deteriorated networks, inadequate operation and maintenance, insufficient cost recovery and low tariffs are usually main causes of deficient water supply services (Zérah, 2000). Furthermore, urban poor often need to rely almost entirely on their own resources and initiatives to obtain water supply and sanitation services, while little or no participation is expected from wealthy people (Beall *et al*. 2000 in Paterson *et al*, 2007).

External agencies have been trying to supplement government failures providing subsidy and grant to the poor, yet results have not been that encouraging, as sustainability is frequently not guaranteed. Past years community participation and cost-sharing strategies has been gaining recognition as main pillars for long lasting outcomes in water supply and sanitation interventions. Community action is seen as a required component to ensure greater effectiveness and sustainability and at the same time, it is seen as progressive social change promoter through empowerment of women and poor people (Clever and Toner, 2006). In this way, the old supply-driven approach is being substituted by a demand driven approach which seeks for a higher involvement of local community.

In fact, the supply driven approach adopted in the past has made community feel that water is to be provided by the government and/or donors and that they do not have to do anything with the water supply and sanitation systems. This has led to the unsustainability of water and sanitation services. With the realisation that the services can be sustained only when they are owned by the community, the demand-driven approach has become much popular in recent years. However, this approach has yet been implemented mainly in the rural areas forming user groups that demand for services and then implement, monitor and follow most of the water supply and sanitation systems.

On the other hand, still top-down and/or supply driven approach is adopted in large cities where water charges are fixed at least to cover the operation and maintenance cost. However, in between the mega cities and the rural areas there is a grey area where efforts are warranted towards the direction of making the water and sanitation services sustainable. As such areas are growing very fast because of the rapid urbanisation that are taking place in the poor developing countries, developing an institutional and financial mechanism appropriate for the poor and small towns and their poor inhabitants need immediate attention.

Forms of the community participation in water supply and sanitation interventions are diverse. Some of them and their advantages are as follows. Participation of community in planning and decision making process enables to select those alternatives better suited to people's needs and resources. Secondly, contribution in cash or kind during the implementation phase not only reduces cost of intervention and favours greater availability of funds, but also promotes ownership feeling. Finally, community members are frequently engaged in operation and maintenance tasks. It is believed that community people will dedicatedly watch over the installations, if ownership feeling has been appropriately developed.

Benefits of community participation are quite a few, but the overall process is also very challenging. A strong facilitating process is a key component of a successful community-led intervention for various reasons. It is essential that community feels the need for the intervention; this can be addressed with an awareness campaign prior to initiation of the intervention for demand creation. A real participatory process also needs well-informed participants who can decide with solid criteria, thus, sessions to extensively inform community about alternatives, operating requirements and costs are highly recommended. In addition, skills on management and operation and maintenance may need to be developed with several trainings to enable community people to assume confidently the management of the schemes.

However, community mobilisation and local participation is particularly challenging in urban areas. In urban settlements mixture of residents, individualism and lack of history may diminish unity of community making community-led interventions less likely to take place fruitfully (Moffat and Finnis, 2005). Likewise, in comparison to rural villagers, urban residents and especially urban poor are less willing to contribute towards water supply and sanitation improvements due to limited spare time. Low "social capital", this understood as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit may also constraint community development in urban areas (Moffat & Finnis, 2005).

The past experience reveals that water supply systems are sustainable when they are owned by the beneficiaries and are managed at local levels with accountability of the service providers and transparency in the accounting of the system. In order to make these features inherent in the system, community participation is a must from the stage of identification and demand for the services. In order to enlist the community support and participation, an innovative institutional structure is needed. The legitimacy of the structure, in fact, depends on its effectiveness in serving the communities, and making the transparent transactions.

Most community led interventions are directed by a users committee formed for such purpose. Lack of a legal framework may impede the users committee to be officially registered and on the other hand, lack of rules and regulations may limit the effective operability of the committee. In this context, proper empowerment of community people and development of an inclusive legal framework are key components for successful community-centred water supply and sanitation interventions.

Moreover, as the amount of aid is not increased as promised in the Millennium compact, the onus of meeting the MDGs including the targets on water and sanitation lies with the developing countries themselves. Therefore, there is need for developing innovative financial mechanism which could help increase the community contribution, so as to decrease the financial burden of the government on the one hand, and increase coverage and access to water for the poor and excluded sections on the other.

## 1.2 Purpose of the document

Community participation appears as a promising pathway to move towards universal drinking water and sanitation access. Keeping this in mind, the document in your hands aims to define strategies to maximise involvement of community in water supply and sanitation interventions in urban poor areas. Thus, the book presents innovative approaches, best practices and decisive factors ensuring effective community participation. Main focus of the book is on urban poor where reinforcing local capacity is specially needed.

The book has been designed to be used as a training course, but in spite of this, it can also be used as a manual or textbook. A potential resource person may tailor made its course according to its needs. It is addressed to those professionals of the water supply and sanitation sector dealing with capacity building and community participation including technical trainers, academia, government bodies, NGOs and grassroots organizations.

The document is based on learning obtained from 20 case studies conducted in Bangladesh and Nepal. Different types of urban settlements and participatory approaches were examined in order to create a broad bunch of models. Hopefully, readers will find suitable practices for their particular situation. Even though field work was conducted in Nepal and Bangladesh, most of the findings can be extrapolated to the rest of the region.

## 1.3 Scope of the document

With the view of preparing this document, 20 case studies comprising significant local participation were revised in Nepal and Bangladesh in order to generate practical knowledge directly from the field. Purposely, the selected case studies contain the most relevant experiences of every country and include innovative practices and diverse institutional and financial models from urban poor areas. Relevant lessons and best practices have been drawn from the various case studies. All findings were shared with sector professionals and their valuable feedback and inputs were incorporated in the document. Thus, despite this document is based on field experience, it also includes extensive technical and theoretical insights.

In order to collect both primary and secondary data, the most significant stakeholders of every case study were consulted during field work. Each case study was evaluated by means of key informant interviews to donors, implementing organisations, Local Government Bodies and user committee members. With the major aim of exploring main challenges of the intervention, local perceptions, and gender dynamics, a group discussion among community members was also performed in every locality. In addition, 70 households from every locality were randomly selected to conduct a household survey and obtain information about the socio-economic profile, level of community contribution and user satisfaction.

Every case study is broadly examined with focus on three main disciplines: institutional, financial and sustainability. A wide variety of institutional arrangements are found in the selected experiences. Main institutions involved in every case study were interviewed to obtain a comprehensive understanding of roles, partnership and level of interaction among stakeholders. The way in which every organisation promoted community participation during the different phases of the project was specially addressed, bearing always in mind role of vulnerable groups and gender perspective. The financial modalities found in the selected case studies are also diverse. Data about costs, income and expenditure patterns and community contribution were evaluated for every case study. Water tariff rates and provisions for vulnerable groups were given special consideration. Finally, sustainability was used as an indicator of the level of success of every intervention. The degree of sustainability was analysed taking into consideration mainly level of service, performance of operation and maintenance and satisfaction of the beneficiaries. At the end of every case study, the main challenges faced throughout the intervention are presented along with the best practices and lessons learnt. Below, all the assessed case studies are briefly described including details about location, main operating agencies and relevant features.

**Table 1-1: Brief description of the Nepalese case studies.**

Country	Location	Operating agencies	Short description
Nepal	Ilam East	DWSS / Municipality	Water supply system with 1811 private taps, 7 community taps and 2 public taps. The system has been managed by municipality for more than 10 years with progressive tariff structure.
	Damak East	DWSS / WSUC	Water supply system managed by the users committee with 2,697 private taps and 3 community taps. There is demand for new connections but the users committee is unable to expand the system.
	Dhulikhel Centre	WSUC	Water supply system with 1033 private taps and 27 public taps which is managed effectively by a users committee since long back. A successful penalty and incentive system ensures prompt payment.
	Khokana Centre	ENPHO/PWO	Successful ECOSAN piloting intervention aiming at constructing 64 ecosan latrines in a semi-urban locality of Nepal. The incorporation of innovative strategies ensured active collaboration of the beneficiaries.
	Aalok Hiti, Lalitpur Centre	WSUC	Innovative water supply project totally led by community people. Up to 200 households have been benefited by the smart initiative. Capital cost and OM is 100 percent born by the community.

Country	Location	Operating agencies	Short description
	Khadiphaka, Kathmandu Centre	Lumanti / WSUC	Water supply and sanitation intervention in a slum area of Kathmandu with high community contribution.
	Khairenitar West	WSUC	Small Town Water Supply and Sanitation Project supported by ADB and implemented by DWSS-GoN. Community bears 50% of the capital cost and the OM of the system. There is special provision for urban poor.
	Dandatole, Butwal West	Lumanti / WSUC	Water supply and sanitation intervention in which partnership of municipality and the implementing NGO was established. Application of cost recovery principle with 80% of the capital cost born by community. The performance of the users committee is not satisfactory mainly due to political differences.
	Shreenagar, Surkhet Mid-West	NEWAH / WSUC	Drinking water, health and sanitation project which provided 10 community taps and 99 latrines. Community contributed labour and materials to cover the capital cost. Users committee is responsible for managing the system. Flat monthly tariff of NRs. 10.
	Mahendranagar Far-West	NWSC	Water supply system with 1,313 private taps and 27 public taps managed by the Nepal Water Supply Corporation (NWSC) inefficiently. Community contribution is absent.

**Table 1-2: Brief description of the Bangladeshi case studies.**

Country	Location	Operating agencies	Short description
Bangladesh	Baganbari, Mirpur, Dhaka	DSK / Committee	Water Supply and Sanitation Intervention in a slum area of Dhaka. Capital cost sharing strategy based on ability to pay for shared water supply and sanitation facilities. Legal water connection from DWASA with NGO acting as a guarantor. Payment of monthly tariff.
	Hazighona, Chittagong	DSK / Committee	Water Supply and Sanitation Intervention in a slum area of Chittagong. Capital cost sharing strategy based on ability to pay for shared water supply and sanitation facilities.
	Ta Block Slum, Mirpur, Dhaka	ARBAN / Committee	Water Supply and Sanitation Intervention in a slum area of Dhaka. Capital cost sharing strategy based on ability to pay for shared water supply and sanitation facilities. Legal water connection from DWASA with NGO acting as a guarantor. Payment of monthly tariff.
	Ghuntighar Slum, Jurain, Dhaka	PSTC / Committee	Water Supply and Sanitation Intervention in a large slum area of Dhaka. Capital cost sharing strategy based on ability to pay for shared water supply and sanitation facilities. Legal connection of DWASA with NGO acting as a guarantor. Payment of monthly tariff.

Country	Location	Operating agencies	Short description
	Old Zimkhana, Narauanganj	Prodipon / Committee	Water Supply and Sanitation Intervention in a slum area of Narayanganj. Capital cost sharing strategy based on ability to pay for shared water supply and sanitation facilities.
	Sirajganj	UN-Habitat/ LGED/ Committee	Local Partnerships for Urban Poverty Alleviation Project (LPUPAP). LGB assume the facilitating role. Water Supply and Sanitation Intervention in which capital cost of water supply and sanitation schemes was fully born by the project. O&M is done by community. The project incorporates promotion of micro credit and saving groups.
	IG Gate Slum Faridabad, Dhaka	UDC/UNICEF/ DPHE/ Committee	Environmental Sanitation, Hygiene & Water Supply in Urban Slums & Fringes Project. Cost sharing strategy based on well being ranking for water supply and full subsidy for sanitation. Payment of monthly water tariff.
	Sreepur, Gazipur	DAM/ LGB/ community	Decentralised Total Sanitation Project (Dishari). Joint initiative of several international and national agencies The main focus of the project is on capacity building of Local Government Bodies and community. Only the very poor obtain some financial support.
	Bashbaria, Sitakundo, Chittagong	VERC / community	Water Supply and Sanitation Intervention in a semi-urban area of Sitakundo. Capital cost sharing strategy based on ability to pay for water supply. Sanitation is promoted through CLTS, in which community is intensely mobilised to achieve the goal of total sanitation. No financial support is given for latrine construction.
	Takhtarpool slum Bakulia, Chittagong	NGO Forum / Protyashi	Water Supply and Sanitation Intervention in a private slum of Chittagong. Capital cost sharing strategy based on ability to pay for shared water supply and sanitation facilities. The land owner contributed a fraction of the capital cost.

## 1.4 Organization of the document

This document consists of two parts: the resource book and the annexes. The resource book is structured in six chapters. Every chapter addresses one of the main issues of community participation including plenty of examples from the case studies which are all presented in the annex. First chapters of the resource book give an overview of community participation as a main instrument to deliver sustainable water supply and sanitation services. Third and fourth chapters address respectively main institutional and financial arrangements favouring successful water supply and sanitation interventions while fifth chapter deals with community based low cost water supply and sanitation technologies. Below, a description of main contents and objectives of every chapter is presented.

- Chapter 1. *Introduction*: Background and purpose and scope of the book.

- Chapter 2: *Community participation for sustainable development of water supply and sanitation*. Main contents: Concept of participation, rationale of participation, participatory tools, factors influencing community participation, gender dynamics.
- Chapter 3: *Institutional arrangement for implementing community based WSS interventions*. Main contents: Community Based Organisations, factors favouring and impeding institutional development and rapport and partnership among main stakeholders.
- Chapter 4: *Financial mechanisms for the design and management of water supply and sanitation interventions*. Main contents: Resource requirements at global and regional levels, design of water tariffs, financial mechanisms favouring inclusion of the poor.
- Chapter 5: *Community Based Low-cost WSS Technologies*. Main contents: Community based water supply and sanitation technologies, criteria for selecting the most suitable technology and operation and maintenance requirements.
- Chapter 6: *Conclusion*. Main contents: reflection around main lessons and best practices extracted from the case studies.

The second part of the book corresponds to the description of the 20 case studies which have served as the base to elaborate the source book. A detailed analysis of every case study is presented in the annex with an individual chapter for every case study. In the annexes the reader will also find examples about how to use the resource book – course framework, modules, session plans, etc.



# Chapter 2

## COMMUNITY PARTICIPATION FOR SUSTAINABLE DEVELOPMENT OF WATER SUPPLY & SANITATION

### 2.1 Introduction

The term participation is a highly relative in terms of degree and most importantly the context. In our case, we will try to see the term participation as community participation for sustainable development of water supply and sanitation (WSS) in poor urban communities. It is now well accepted that active participation of a community is a determinant in ensuring sustainability of service provisions in WSS. For better clarification it is important to understand adequately the term participation. It can be explained as a process through which stakeholders influence and share control over development initiatives, decisions and resources etc. which affect them. The essence of participation is exercising respective voice and choice. Beneficiaries' or end-users' participation in WSS initiatives in urban poor areas can be brought about in several ways: directly, through participation in decision making; indirectly, through leaders; or through representation of committees or boards. And these participations of beneficiaries can be facilitated through extension workers, local government units, non-governmental organisations (NGOs), and the private sector.

As mentioned above the community participation in decision making and building ownership in WSS development efforts results in effective and sustainable development process. This understanding has played the central part in the shift in institutional strategies from supply-driven to demand-driven approaches, which respond to the felt needs and aspirations of users, especially the poor communities. However, quantitative evidence of the efficacy of participation in determining project effectiveness, relative to other factors, is rather

difficult to assess in numerical terms. Participation is also a voluntary process by which people, including the disadvantaged, influence or control the decisions that affect them.

The global experience tells us that poor performance of public sector has led to a widespread search for institutional alternatives and means to increase the accountability of the public sector and promote sustainability. This kind of situation has forced the sector professionals to think about the more challenging issue of sustainable WSS services in poor urban context where public sector investment is virtually absent. The search for effective strategies more and more tells about the necessity of community participation at all stages of the WSS interventions. How community participation is to be defined will depend upon on the objectives and the needs and possibilities for participation. No matter whether a maximum or minimum community involvement is developed, some central questions will have to be answered and tested in the field: who participates in which phases and decisions, how and to what degree, and what effects are desired for the programme and the community?

To start with, the working definition of community participation can be considered from three dimensions. These are: (i) involvement of all those affected in decision making about what should be done and how; (ii) mass contribution to the development effort, i.e. to the implementation of the decisions; and (iii) sharing in the benefits of the programs or projects. Since equitable share of benefits is essential, community participation can be defined by involvement of the local population actively in the decision-making concerning development projects or in their implementation. Involvement of community population in the physical works of implementation of project is also sometimes treated as participation. This kind of involvement prescribed passive acceptance of services and provision of supports in cash or kind, in giving money for a pump, digging a well for a water supply, or excavating pit for a sanitary latrine block in a community environment. The dynamics of changing society, however, demand much more than mere acceptance, allegiance, and unpaid labour. Participation is viewed as a means to defined ends, not as an end in it. The goal therefore is to optimise participation to achieve the desired project goals, not simply to maximise participation. The desired goals in WSS development in poor urban communities include achieving improved water supply and sanitation services along with developing the human, institutional, and management capacity of the community to take care of the problems as they arise and ensure sustainability.

Community participation is therefore essential if one aims at sustainable development. The principle underlying participation to give community people a voice is constant, yet the choices that people make vary infinitely. Thus, a community may decide to subcontract maintenance to an independent mechanic rather than to undergo training and take turns doing the work. A water users' group may choose to dissolve the organisation or to define new goals after the first ones have been met. For example, when construction is complete, a water committee may transform itself to undertake sanitation construction, or to focus on children's education. Alternatively, people may informally nominate leaders to represent their interests through different informal committees or bodies. However, in practice the concept of 'community participation' relates mostly to the involvement of people in externally initiated development interventions. It has generally been the practice that external agencies control the resources which are used for the communities' benefit. The motivation for this arises from the need for donor accountability, lack of project management and financial skills in the communities and often essentially it is based on the premise that communities are not capable of managing their own development process particularly in poor urban situation. At the same time negative project experiences have led to the realization that project sustainability and viability is dependent on community involvement. The 'outsider knows best' approach where the external agent 'does the development' for the recipients, created problems of factors unknown to the implementer disrupting the project objectives, and undermining sustainability.

Community Participation is therefore an essential component of community water supply, ensuring sustainability through development of a sense of ownership and community capacity and commitment for ongoing repairs and maintenance, as well as reducing project costs. The move towards participatory development, in the late eighties and nineties, challenged the concept of mere participation as active involvement of beneficiaries in an externally driven process. The need for a participatory approach which gives communities input into and control of the full project process is stressed. Participation is also seen as important to ensure that a development intervention meets the needs of the whole community - including those of marginalised groups.

Participation in real sense involves equality in decision-making throughout the Project Cycle - i.e. assessment, planning, implementation, evaluation. The conceptualisation of a community-driven process is simplistic in that it assumes that a facilitator may impart the skills needed for the community to manage their own development process. The nature of project facilitation has the capacity to significantly alter the achievements of a project. There remains, however, a problem of power since the presence of an external body in any form results in power dynamics between this body and the community members. The varied approach of the facilitators suggests that they interpreted the project objectives and process to attain these in different ways. The key relationship to understand is that of the facilitator with the community, since although this may, in theory, have been neutral, the translation of project objectives in to project control, served as a hidden form of control by the facilitators.

Given the historical skill shortages in poor urban areas the role of the facilitator is crucial. Time and financial constraints must be overcome, allowing the facilitator to adopt an approach which is conscious of allowing the community the space to develop at a personal and institutional level, which in the long term will give them the authority to control their own development. Critical to this is adequate definition of the facilitators role and the provision of adequate training and support. Nevertheless, irrespective of the nature and quality of facilitation, fundamental questions remain regarding the processes required for sustainable water and sanitation service development. There is a tension between the immediate need for the service, and the development process which must be undergone to obtain it. In water and sanitation development, it is the physical product – water and sanitation systems - which is the motivation behind the project. Empowerment may also be a product perceived by an external sponsor as equally important, but it is never the immediate priority of the communities.

Participation in water and sanitation projects is relatively easy due to the desperate need in many poor communities particularly urban slums. However, the process of ‘community managed’ development is long and slow, and there is often conflict created between the pressing need for water and the slow process of empowerment. The use of local educated youths, male or female as facilitators, rather than highly paid external personnel, results in cost-savings even allowing for the additional facilitation time. This process has also led to a high level of community understanding of the process, and a shift from a facilitator-driven process to one in which the community understands and supports the empowerment process. A question still remains; can a community be empowered when they perceive themselves to be acting because of funder control? The authority of the utilities ultimately has responsibility for water provision. However, there is also a need for community control over the development process. This does not necessarily imply that communities must be involved in physically running their own projects, but that there is a dialogue between community and the utility which ensure participation in implementation, operation and maintenance of the systems be it water supply or, sanitation. This should be based on a sound understanding of the community and its heterogeneity, and the willingness to listen to community priorities. To empower communities, strategies must be developed by the authority of the utility to allow community people the knowledge needed to make real choices and the skills necessary to understand the implications of these choices and to control the implementation of development.

The rationale for Community Participation and its importance in all development efforts particularly in WatSan and specifically in WatSan in poor urban areas can be summarized as follows:

- With participation, more will be accomplished;
- With participation, services can be provided more cheaply;
- Participation has an intrinsic value for participants;
- Participation is a catalyst for further development;
- Participation encourages a sense of responsibility;
- Participation guarantees that a felt need is involved;
- Participation ensures things are done the right way;
- Participation uses valuable indigenous knowledge;
- Participation frees people from dependence on other's skills; and
- Participation makes people more conscious of the cause of their poverty & what they can do.

It is evident that community participation is central to sustainable development of WSS in poor urban areas. This participation takes different forms in different context and the extent of participation also varies. By now various approaches, significantly different to one another have been evolved to undertake WSS interventions and community participation takes different shape and nature in these approaches.

## **2.2 Community Participation in Various Approaches of WSS Interventions**

Community participation in WSS projects can be classified into categories based on the degree and nature of their participation. The gradual transformation of top-down approach to bottom-up approach in the WSS intervention has been perceived in the sector globally. The nature and degree of community participation is significantly different in these approaches. The subsequent sections deal with different approaches and community participation in them.

### **2.2.1 Top-down approach**

#### **2.2.1.1 Supply driven approach**

The top-down approach, also popularly known as supply-driven approach has been practiced for quite a long time. In this approach projects are designed, planned and implemented by the implementing agencies often public agencies. But it was not uncommon even in NGO initiated and supported projects in the past. The implementing agencies used to take proactive role in all stages of the project from inception till implementation. In many cases the past tradition was that these agencies also used to take care of operation and maintenance of the WSS systems. There is hardly any scope for participation of the users. Such approach often results poor service delivery and deterioration of the facilities and in many cases without any use. The main reason is the lack of ownership. The construction of any water supply and sanitation facility can be done by any agency provided it has the technical capability and required resources. However, experience shows that similar approach of construction of the facilities failed to provide continued services to the targeted beneficiaries. To overcome the problem of ownership, operation and maintenance, it is universally agreed that users' participation is the key towards sustainable development.

Participatory management for water supply and sanitation projects may be considered as the foundation for sustainable development of WSS. The problematic issue therefore is not technology and construction but rules and regulations around institutions, organizations and the people. There are many challenges and one of the challenges is with the facilitating organization itself. It has to create an incentive for its own personnel to work in partnership with hundreds of communities. The second challenge is the task to enable communities to make informed choices, manage and choose from a range of water supply or sanitation options that are technically feasible. Although the facilitating agencies' tasks have changed dramatically over the years, but the fact has seldom been recognised or acknowledged by the agencies themselves. Hence, the agencies and their competency, organisational structure, and management style have remained largely the same. The mismatch between the mandate and full-scale competence of the agencies has resulted in many unsuccessful attempts to induce participation. The key question, then, is; how can organisations change to induce participation in collective actions?

## 2.2.2 Bottom up approach

The worldwide search for factors that determine the sustainability of water and sanitation investments has led a nearly universal recognition of an approach termed as bottom-up approach. This approach can further be categorized in two somewhat different approaches. These are: (i) demand driven approach (DDA); (ii) demand responsive approach (DRA). The concept of DRA is gaining more importance and acceptance over DDA. It is now more commonly termed as '*participatory and demand responsive approach*'.

### 2.2.2.1 Demand driven approach

Both the concept of DDA and DRA take their foundations at grassroots level. However there is a difference in DDA and DRA. The project conceptualization is based on perceived demand by the end users at grassroots i.e., at community level. And then matching the perceived demand with the arrangement for provision of services makes the structure of the project.

In a demand driven approach community participation could be in a various forms as mentioned below. These are rather designed by the project management in consultation with the community. In reality community plays a passive role in most of the cases while project personnel play the active role. Communities' response in addressing perceived demand of services is not always based on willingness to pay for services. There are demands from the communities for services but it is not confirmed that they pay for the services accordingly. There remains expectation by the community for meeting their demands by external support agencies. Although the project is formulated based on perceived demand it cannot be termed as demand-responsive rather demand-driven. Conceptually there are differences in these two approaches.

Forms of community participation in a demand driven approach:

#### **Financial Contribution by the Community:**

Cash collections made by and within the community, generally prior to or at the time of implementation of a project, usually as a contribution to capital construction.

#### **Contributions in kinds:**

In these projects a specific group of local inhabitants contribute their labour (and perhaps other inputs) to its implementation, while there is also the assistance of an external agency. They need to pay at a reduced rate for the services they receive. To get the entire community involved in the project it is expected that every household makes a contribution (usually in labour). Food-for-work projects may perhaps be included here,

though the element of community participation may be at a lower degree if it consists only of labour in contrast of paying cash or kind for their services.

**Contribution by services – ‘Community Workers’:**

A few potential community members may be engaged to facilitate certain specialized task e.g. as community health worker, or operator of a community water supply system, or a caretaker of a sanitary block. To provide them required skill and ensure their services for the project, appropriate training and technical supervision are carried out by an external facilitating agency.

**People’s Participation - Bangladesh Context:**

Although involvement of the project stakeholders in planning and implementation has been practiced in Bangladesh since 1960s with the rural development movement people’s participation was very limited. Immediately after liberation in 1973, national NGOs promoted the issue and showed the alternative of project implementation process. In mid 1995, the GOB has endorsed a new dimension in planning termed as Perspective Planning Process – PPP, claiming that the planning process (PPP) is genuinely replacing the traditional central planning exercise whose centre-piece is the local level participatory planning. The expectation was that, conceptualization and planning would be conceived at the local level for the local people by the local people. In theoretical terms three distinct elements separated the process from the traditional way of planning procedure. These are:

- participatory bottom up approach involving the local people in plan formulation;
- emphasis on augmentation of investments by the Govt. and private sector to attain the sustainable economic growth and reduction of poverty; and
- an institutional framework at local level for implementation of the programs.

Demand assessment can be undertaken by following a rapid participatory survey at community level applying a pre-designed checklist. The following table 2.1 shows the requirements of the community against objective requirements for health in respect of water use. The community requirements can be well understood through community consultation.

***Table 2-1: Sample Checklist of Uses for Water and Relevant Requirements***

	<b>Use of Water</b>	<b>Requirements for health</b>	<b>Requirements for Convenience</b>
1.	Drinking	Purity	Taste: will boiled or tubewell water be rejected?
2.	Rinsing mouth, cleaning teeth	Purity (perhaps less stringent)	Is there a custom of using surface water, which is suspected?
3.	Food preparation-uncooked food	As above	Is there a custom of using surface water, which is suspected?
4.	Dishwashing	As above	Preference for running water?
5.	Cooking		Taste, colour and clarity
6.	Personal hygiene (washing hands, ablution)	Abundance. Use with soap or heated	
7.	Bathing, swimming	No schistosome organisms	Seclusion (for women)
8.	Washing cloths	As above	Softness (economy of soap)? Preference for running water?

	Use of Water	Requirements for health	Requirements for Convenience
9.	Watering of domestic animals		Requirements of each type of animal
10.	Vegetables gardens	Sullage acceptable but sewage only after some treatment	Space near house? Damage by pigs or other animals?

This checklist is only a sample and will be needed to be modifying in local circumstances. In the third column, many more concerns will certainly be apparent in each community.

The PPP appeared to have many limitations in its implementation. Despite all the limitations of the PPP, the initiative was considered to be of great importance to the future planning agenda to the planners, decision-makers as well as the population. The sector agencies DPHE and the LGED also practice the same in many projects in the field of WatSan and infrastructure development. The PPP may at best be termed as demand-driven approach although the demand assessment was proactively made by the sector agencies rather than people and community.

#### 2.2.2.2 Demand responsive approach

A new water supply and sanitation planning approach called the “demand-responsive approach” (DRA) is now becoming accepted in many developing countries. This approach is being promoted by many funding agencies because supply-driven projects, where ‘water and sanitation’ is simply delivered to communities with little or no involvement of community members, have largely failed around the world. It is being established on the premise that water and sanitation services should be seen as economic goods. The demand responsive approach was developed after the failure of many different approaches, such as the supply-led approaches to increase sustainable water and sanitation coverage. The most common failing of the past water and sanitation programmes have been failure to take into account the expressed needs of the users. This is due to existing institutions that have been organizationally structured to provide services in a supply-driven manner. In contrast of supply-driven approach, the demand-responsive approach based on locally generated demand has demonstrated:

- Greater sustainability over time;
- Greater levels of cost recovery;
- More meaningful health improvements in project areas;
- Better adherence to basic maintenance and repair; and
- Economic spin-offs for the local community, particularly women.

The key characteristics of demand-responsive approach (DRA) are as follows:

- community members make informed choices about:
  - whether to participate in the project;
  - technology and service level options based on willingness to pay (based on the principle that more expensive systems cost more);
  - when and how their services are delivered;
  - how funds are managed and accounted for; and
  - how their services are operated and maintained.
- government plays a facilitative role, sets clear national policies and strategies, encourages broad stakeholder consultation and facilitates capacity building and learning;

- an enabling environment is created for the participation of a wide range of providers of goods, services and technical assistance to communities, including the private sector, and non-government organizations; and
- an adequate flow of information is provided to the community, and procedures are adopted for facilitating collective action decisions within the community.

The Demand Responsive Approach (DRA) can be defined as 'a methodology that allows demands of the consumers as individuals and as a community to guide key investment decisions. Such an approach supposedly establishes clear links between the kind of service and service benefits the stakeholders want and what they are willing to contribute in cash, labour, and time for the establishment and running of these services. Applying the concept of demand-driven planning into practice is just beginning and much remains to be learned about the practical implementation of this approach particularly in WatSan interventions. Experience shows that the implementing agencies are keener to undertake water projects using the DRA methodology than sanitation projects because sanitation improvements appear to be more complex to achieve. The relegation of sanitation to a lower priority than water has resulted in most of the urban informal settlements having extremely poor environmental sanitation conditions.

Effective implementation of the DRA methodology in WatSan intervention in poor urban communities depends on the following thematic areas:

- Determinants of demand for improved water and sanitation services
- Social intermediation issues
- Technical choices of water and sanitation
- Institutional issues
- Financial and economic issues

### **Determinants of Demand**

The principal determinants of demand which have a significant impact on the DRA implementation are as follows: income, the cost of improved water and sanitation services, tenure and homeownership, and level of education.

#### ***Income:***

The level of household income is important in determining demand for improved services because it indicates whether a household has the ability to pay or not. The low willingness to pay for improved WatSan services therefore has an impact on the implementation of the DRA methodology because the methodology is designed to respond to those who express demand. It is suggested in the water and sanitation sector that households can make upfront payments as a declaration of their demand for improved water and sanitation. The assessment of household income in urban poor communities is problematic, and although the household monthly expenditure route was used, it was found not to be dependable because most of the households do not keep a record of how much they spend in a particular month and it tends to vary. As a result, assessing demand under such circumstances proved to be problematic and unreliable. This leads to the conclusion that household income is a major barrier to the implementation of the DRA in urban poor communities because the majority cannot afford to pay significant tariffs for water and sanitation services. Poverty in the urban poor communities is therefore the greatest barrier to the implementation of the DRA methodology.

***Cost of services:***

The DRA emphasises that consumers should cover a larger share of the cost of providing water and sanitation services. However, as pointed out above, the majority are marginalised by the cost recovery measures due to the cost of services. There is need therefore to design cost recovery programmes with the poor in mind. The conventional waterborne toilet facilities provided by the agencies in some urban poor areas are beyond the reach of the majority of the residents, whose incomes are very low. Unless relatively more affordable toilet technologies are used it is impossible for the poor communities to afford them without substantial subsidies.

These factors have a direct impact on the DRA; unless affordable services are provided to the urban poor communities it will be difficult to recover costs from them as the DRA prescribes.

***Tenure and Homeownership:***

The issue of home ownership and land tenure is of great concern to many households. Many tenants complained that they are unable to participate fully in community programmes due to the uncertainty of their long-term residence in a particular house. Length of residence depends on their landlords whom they claim, could evict them at any time even without valid reasons. The fact that many landlords do not live in the informal settlements worsens the situation, as they do not participate in community programmes that affect their tenants and they do not have firsthand experience of the water and sanitation problems. Such a situation therefore affects a household's participation in community activities, which is ultimately a barrier to the DRA implementation. Land tenure and homeownership barriers have an impact on community organisation and may influence willingness to pay for improved services.

***Level of education:***

It is widely known in the water and sanitation sector that effective programmes depend very much on awareness and mobilisation through education and communication. In order for a household or a community therefore, to evince demand for improved water and sanitation services they need to have knowledge about the service providers in their area and their community leaders, as well as, about the existence of different types of water and sanitation technologies. The level of education in the community is, however, low and as a result many of the community members have little knowledge about service providers and even about their own community organisations. The community leaders and representatives are equally ignorant and lack key community organisational skills, which are vital for the implementation of the DRA methodology. There is clearly a lack of awareness in urban poor communities about the key issues that are vital to the implementation of the DRA methodology such as good community organisation. Likewise, there is a gap in knowledge about the existence of different water and sanitation technologies. Therefore, civic education needs to be undertaken in order to increase the possibility of providing sustainable water and sanitation services through the use of the DRA methodology. In situations where poor people may not always be able to express their demands, project staff of facilitating organization need skills in social mediation and communication to enable them to do so. This, however, conflicts with the requirements of the DRA which encourages communities to express their demand for improved services based on their needs and their ability to pay. Influencing the community demand may lead to the perpetuation of the supply-led approach that the DRA is meant to replace.

**Social Intermediation Issues**

The DRA methodology requires that consumers should be engaged in the process of selecting, financing, implementing and managing of water and sanitation facilities according to expressed demand. Whilst there are benefits to devolving responsibility for water and sanitation management to the community level as the DRA advocates, this can place a considerable burden on the already impoverished social organisations. Voluntary nature of community participation in projects has a negative impact on community organisation. This has been exacerbated by the unfavourable economic situations in the community, which makes it difficult for community members to devote more time to non-paying community work at the expense of income generating

activities. Experience gained from the field surveys shows that communities could only spend some time for one-off projects and not recurring ones. Readiness to participate in community programmes was found to be higher in cases where households were compensated for their labour contributions. The voluntary nature of community leadership is therefore a barrier to the implementation of the DRA methodology in urban poor communities. This is also compounded by a considerable number of people who view their stay in informal settlements as a temporary abode during a particular phase of their lives. This, however, presents a problem in that other than living in the same locality the people often have different interests with little to unite them and no sense of belonging at all to the settlement. This may affect the implementation of the DRA. In the absence of technical support from local authorities and other agencies, communities will remain poorly organised, making it difficult for them to be engaged in the process of selecting, financing, implementing and managing water and sanitation facilities based on expressed demand. The lack of capacity at local authority level has further exacerbated the problem.

### **Technical Issues**

A distinctive feature of the demand-oriented programmes is that users are allowed to make choices from a range of options that are tailored to communities' willingness to pay. However, the limitation in technological choices in poor urban areas has a negative impact on the DRA implementation in that it limits poor households to expensive water and sanitation systems. This issue is compounded by the bad physical locality of many informal settlements. There is pressure to provide as many water and sanitation facilities as possible within a limited time and of a particular technology. Donor organisations have a similar tendency to put emphasis on the number of water sources and toilets built using their money without any serious regard for community participation or sustainability. The issue of technical choice is therefore one of the major hurdles to the implementation of the DRA in urban poor areas. This effectively limits the community or households to only one form of technology even if they may not have the ability to pay for it.

### **Institutional Issues**

To maximise the impact and sustainability of water and sanitation programmes, institutional aspects need to be addressed comprehensively, as part of a collaborative approach with collaborative partners. The coordination of multiple institutions or departments in water and sanitation provision is often problematic. Absence of a specific institution or department with the responsibility for 'water and sanitation' provision to the poor communities results in their being left out. Budget constraints also foster intense competition between various departments and this often motivates against cross-departmental cooperation. The poor coordination of departments dealing with the provision of water and sanitation is an obstacle to the implementation of the DRA because the contributions of all those departments are vital to the smooth running of successful sanitation programmes. There is very little understanding of the role and function of local government in relation to other levels of government and there are very few interactions between the various line departments. There is also still very little understanding of how to communicate new responsibilities and their implications to senior management and the local council and of how to be accountable to customers within a service delivery framework. These challenges are great even for the most skilled staff and councilors. Continuous training and promotion are required for the necessary capacity to be developed before the legal requirements will be effectively fulfilled. Under such circumstances, it is almost certainly impossible to implement programmes using the DRA methodology due to its complexity. Many decisions made at central government level are not implemented due to the lack of resources to implement the decisions, demonstrating the weak linkages between policy and resources. There is no legal framework and no effective strategies to guide the provision of water and sanitation services to the urban poor communities. The lack of capacity, coupled with poor administration and coordination at both community and agency levels, are major barriers to the implementation of the DRA, because it is interdisciplinary in nature.

### **Financial and Economic Issues**

The DRA puts emphasis on the economic value of water and sanitation. The approach encourages a consumer-orientation to develop financially viable water and sanitation services. Unlike water, for example, sanitation is not considered to be of paramount importance to the communities due to the many alternatives that they have at their disposal. This low priority for improved sanitation inevitably leads to low demand for the service and ultimately to low willingness to pay for it. The DRA is inherently linked to finance with an implicit assumption that ‘demand’ as expressed by poor communities can be equated to willingness to pay for a particular kind of service. Without reliable information about community preferences and their willingness to pay therefore, any attempts to implement the DRA are likely to fail. For the DRA to work there is need for efficient cost recovery mechanisms in the communities. At community level, there are problems related to the management of the cost recovery due to their limited capacity. The expectations of communities to manage financial transactions in water and sanitation projects may contribute to unsuitability of the DRA methodology in urban poor communities. Significant challenges remain, particularly relating to financing arrangements at both community and institutional levels. A major barrier to the implementation of the DRA is the need to balance financial sustainability and poverty reduction objectives. Financial cost is already a significant barrier preventing many urban poor communities from accessing improved sanitation facilities. A key social issue being faced with the implementation of the DRA therefore is the reconciliation of the demand for improved sanitation services with a limited ability to pay among the urban poor consumers.

## **2.3 Participatory Tools and Techniques**

Participatory tools are developed to facilitate community participation in development programmes and these are found effective particularly in WSS interventions in poor urban areas. These tools aim at encouraging individuals to participate in a group process irrespective of their age, sex, social class or educational background. They help building self esteem and create responsibility. They therefore can also be very well used to adopt a gender sensitive approach in water supply and sanitation programme. In this section some tools for community participation that are most frequently used are illustrated.

### **2.3.1 Tools commonly used for community participation**

#### **2.3.1.1 Interpersonal interview**

Different types of interviews exist, four of which will be briefly discussed in this section. A community interview tries to involve all of the residents of a village or urban neighborhood. Such an interview will provide a lot of information in a relatively short period of time. However, some community members may be hesitant to speak up in a big group. Community interviews are therefore less suitable to find out about sensitive issues such as hygiene behavior. Group interviews can be conducted with a group of randomly encountered persons (e.g. at the market, teahouse), or with systematically selected groups on the basis of gender, age, wealth, etc. Group interviews are less time consuming than individual interviews, but they are less suitable for discussing sensible issues. Key informant interviews are conducted with persons who represent the community (for instance village headman or religious leader) or with persons who represent a specific group. Individual interviews are time consuming but do better allow discussing sensitive issues provided there is a good rapport between the interviewer and the respondent.

A questionnaire is often used to help structure the interview. This may contain open questions where the respondent can elaborate his/her opinion and closed questions where a limited choice in answers is given. These questions should pre-tested and be gender specific.

Examples of key questions for individual interviews

- How many family members are part of your household (men, women, and children)
- Who collects the water for the household (men, women and children)?
- Are different sources used for different purposes (drinking, cooking, and washing)?
- Are different sources used by different persons (men, women, rich, poor)
- Do men and women use the same latrine?
- Who cleans the latrine (men, women, children)?
- What do men, women and children use for hand washing (only water, soap, ashes)?

It is important to carefully select the time and place of the interviews. During the interview only the group of persons or the person being interviewed and the interviewer(s) should be present. This is to avoid that others disturb the interview or influence the answers given. To ensure a good gender differentiation it is for example important to possibly avoid interviewing women in the presence of their husbands or male family members. Before the interview starts, the interviewer should introduce him/herself properly, explain why the interview is being conducted, ask for permission to record the results, ask for any queries and thank the group or individual for their participation.

#### **2.3.1.2 A community walk**

A community walk is an observation tool that can be used by an external reviewer as well as in a participatory way together with community members. By walking through the community an indication of the situation can be obtained and registered (Box 4.6). The walk may include brief house visits, with informal discussions, about water supply or sanitation while appreciating the general in-house situation. One person may do the community walk or several persons may be involved at the same time in small groups. Large groups should be avoided since these disrupt the normal situation too much. The walk should be planned during the time of the day when most water and sanitation-related activities take place.

Important issues that can be included in a community walk:

- Type and state of settlements;
- General environment conditions;
- Condition of garbage disposal;
- Who is responsible for garbage disposal? (men, women);
- State and functioning of current water source, distribution and supply;
- Who is responsible for operation and maintenance (men, women);
- Availability of tools and spare parts;
- Skills of caretaker (ask him/her to show how regular maintenance is carried out);
- Cleanliness around water points, who cleans the water points (men, women);
- Drainage of used water;
- Hygiene practices (men and women) for the transport and storage of water;
- State and functioning of private and public latrines;
- Who uses the latrines (men, women);
- Who is responsible for cleaning and repair of latrines (men, women);

- General hygiene behaviour of men and women, hand washing after defecation and before food preparation and eating, use of soap or ash for hand washing, washing of clothes, bathing and face washing, use of a clean towel.

### 2.3.1.3 Community Mapping

The purpose of mapping is to gather information about a community by having its members create their own village map. It is also used to collect information about existing problems and to perceive the value which community members give to certain situations. It is proposed to community members to draw a map either on a sheet, a board or even the soil (Figure 2.1). In this map they are asked to highlight the following points: main localization of settlements and distribution of population including main topography; identification of health centre, schools, shops, market, church, meeting points for women and men; localization of water points, zones of infections or problems, water source and distribution, localization of latrines and garbage disposal, persons using the facilities (men, women); specification of which water points have continuous or seasonal variations, the type of water, functioning; where is the population with the lowest willingness to pay; identification of the economic activities of men and women.

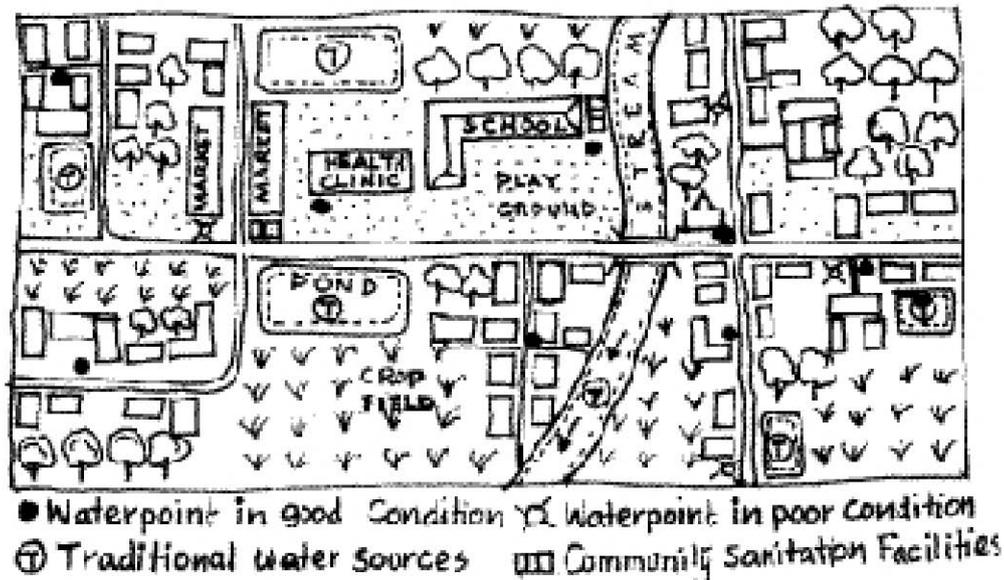


Figure 2-1: Village map prepared by a group of men and women

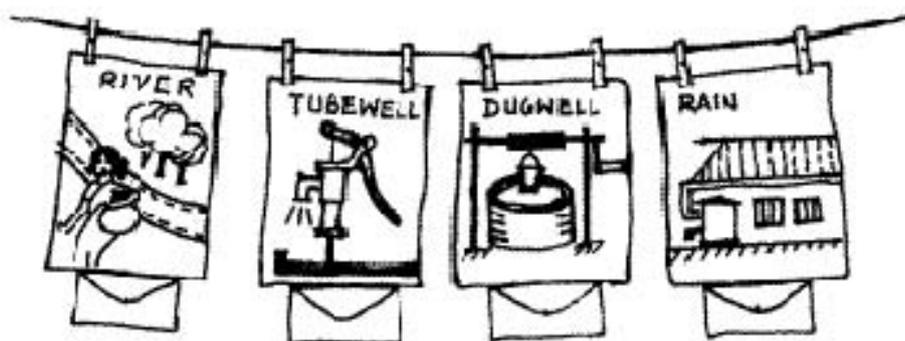
The village map, in combination with a ranking tool such as the pocket chart (section 2.3.1.4) the most important problems and needs related to water supply and sanitation can be identified. This assessment can be made gender sensitive by having one map made by women and another by men as to make the assessment gender sensitive.

### 2.3.1.4 Pocket chart

The pocket chart is an effective method to collect information about people's perceptions, habits, desires and will. It provides quantitative information by a system of votes. The results can be used to hold discussions with the community members. Figure 2.2 presents an example of pocket charts to identify different sources of water used by community members.

Drawings are prepared beforehand, preferably by a local artist. An alternative is to ask the participants to make drawings. This for example works very well with children. An envelope is attached to each drawing. Women and men are given little pieces of paper with different colours, in this manner the gathered information is gender-sensitive.

If the tool is used in combination with mapping, the drawings could, for instance, represent problems related to water supply and sanitation. The facilitator may ask the group: What do you find the most important problem related to water supply



*Figure 2-2: Pocket chart on different sources of water*

If the tool is used to collect information about habits, each drawing can, for instance, represent a possible water supply option (handpump, in-house connection, standpost) or sanitary option (simple pit latrine, VIP, pour-flush latrine). The tool can also be used to rank different issues. Figure 2.3 provides an example of matrix ranking for different water sources and use. If matrix ranking is used for decision making on technology options, drawings of the different technology options are placed on the horizontal scale and characteristics of the different options on the vertical scale.

USE	SOURCE	RIVER	TUBEWELL	DUGWELL	RAIN
DRINK	Envelope	Envelope	Envelope	Envelope	Envelope
WASH HANDS	Envelope	Envelope	Envelope	Envelope	Envelope
WASH CLOTHS	Envelope	Envelope	Envelope	Envelope	Envelope
GARDEN	Envelope	Envelope	Envelope	Envelope	Envelope

Figure 2-3: Matrix ranking

### 2.3.1.5 Focus group discussion (FGD)

A focus group discussion can be used to verify the results of or complement a survey. The discussion is organized with separate groups of men and women. Usually, the information obtained from a focus group discussion with women is quite different from a discussion with a group of men. Information from different groups of women (rich-poor, young-old) may also differ.

Before the discussion is held, the facilitator identifies the topic for discussion, formulates a set of questions for the discussion and criteria for the selection of the group members. Usually groups consist of 4 to a maximum of 12 persons.

If, for instance, the data collected in interviews suggest that women cannot take up the role of caretaker, this may be a good topic for discussion in a focus group. In this case questions could include: What do you think the tasks of a caretaker are? Which of these tasks cannot be carried out by women and why? Which measures can be taken to take these barriers away?

### 2.3.1.6 Case Study

Case Study is a qualitative research method that provides a detailed analysis of a single “case”. A case study tries to give the “whole story” of a particular event or situation. A case study could be as broad as a certain community, a culture, or (in this case) selected household members who were involved in a sanitation and hygiene education programme.

### 2.3.2 Strengths and Weaknesses of Participatory approach

*Table 2-2: Strengths and Weaknesses of Participatory approach*

Participatory tools	Merits	Demerits
Interview	A good overview of the present situation can be provided in a relatively short period of time.	The answers given by the persons interviewed may not always be in accordance with what happens in reality. Sometimes the persons interviewed try to give 'the answer they think the interviewer would like to hear. (This is particularly true if the questions relate to behaviour.)
A community walk	Direct observation and contact with reality for field staff. In combination with interviews observation is a powerful tool, it supplements and cross checks information obtained in interviews. It helps the community to better understand their situation particularly when differences between rich and poor are considerable.	Recording the observations in a non-biased way requires experience. Perceptions of observers may differ.
Social Mapping	Provides a common understanding about a village setting and its problems. Very participatory and enjoyable for the community. Simple and easy to understand. In combination with a ranking tool, mapping can be helpful for problems and needs analysis.	The tool is time consuming and the geographical information provided in the map however, often is not accurate.
Pocket chart	Provides statistical information. Problems can be discussed immediately. Community members are able to identify themselves with the pictures.	
Focus Group Discussion (FGD)	Provides detailed and good quality information.	Needs good preparation and facilitation to ensure topic focused discussion.

### 2.3.3 Challenges for participatory approach to ensure sustainability

There are a number of challenges for effective participation in development process in urban poor communities. They do vary according to country, social and cultural context. The common challenges are as follows:

- Excessive pressure for immediate results
- Gate keeping by local elites
- Selective participation

- Over reporting of development success
- Inhibiting and prescriptive role of state
- Hard issue bias
- Conflicting interest groups
- Lack of public interest in becoming involved
- Power structure

## 2.4 Factors Influencing Community Participation

Conceptual understanding of Community Participation is very important to deal with the subject. As evident from experience any factors influence community participation, including the immediate and broader policy context; client characteristics (including felt need); and agency characteristics, such as flexibility, responsiveness to clients, and willingness to invest through community-based organisations. In this regard, the following questions are to be addressed:

Does people's participation contribute to project effectiveness?

How important is this contribution, relative to other factors?

What factors and strategies influence participation in collective actions?

What are the lessons for the design of large-scale project?

What are the implications for policy reform?

For further clarity by community participation we understand that users of water supply hygiene and sanitation services participate to a project cycle by assuming a responsibility exercising an authority and a control over the setting up of the services (Tandia 2006). The community participation in years of 80s aimed at improving the contribution of the community and at the same time taking into accounts the need and the demands of the communities on the development of the community services. But this approach did not consider really the questions related to the accountability local specific needs and the low utilization of locally available resources. Making participation of users in various stages of project cycle has always been a challenging task and depends on various factors. In the context of developing countries few basic factors are: role of support organizations, fulfillment of basic needs, recognition of CBO and availability of low cost technologies. The following sections discuss the factors more elaborately:

### 2.4.1 Role of Implementing /support organization

The role of implementing organization is very vital in ensuring the community participation. Specifically the policy, strategy and innovative programme adopted by them. When the policy adopted by the SOs does not match with the community's interest it is difficult to involve community members in the project activities. There are a number of issues in urban slum areas many of which are complex in nature and demand huge effort to address. The SOs are required to be very active and prompt in addressing those issues. Likewise, innovative approach is to be adopted by them to address those issues and to get community involved in the project cycle.

The initiative of *Prodipon* for old Zimkhana in Narayanganj can be a suitable example. The water and sanitation situation was terrible as water and sanitation facilities could not be installed due to ownership issues. It is to mention here that the slum is situated on railway land. *Prodipon* advocated the municipality to

provide WSS services in the slum and at the same time community influenced the local ward commissioner. The community arranged several meetings with pourashava chairman ward commissioners, and made applications to observe formalities to get approval from the authority. It is the Prodipon who made the community involved in the issue and through them it made the WSS intervention possible.

The financial and implementation policy adopted by WSS project also attract under privileged section in particular the women to involve in the project. In many intervention areas women are not only found to be a member of OMC but also found exploring opportunities of doing business.

#### **2.4.2 Recognition of CBOs**

Community based organizations (CBO) are common in poor urban areas to represent the respective area. The CBO is mainly responsible to take various initiatives for overall improvement of the area (slum). These committees are the platform where the community members can get together and involved in various development activities. However, the people prefer those platforms to be involved with for dignity which have social and official recognition.

Though the CBOs have massive potential to provide positive impacts into the slum but the committee does not have legal status to maintain legal communication with government and other stakeholders. The committee is informally communicating with government organization and other stakeholders in mutual understanding with the SOs and the local government organization.

The scale of community participation is also dependent on smooth functioning of CBOs. A committee cannot be functioning for a longer period only on verbal understanding among different stakeholders. People would provide active cooperation to CBO if those committees keep transparency in their activities and strictly follow rules and regulation to implement watsan activities. There should be clear guidelines about opening of bank account into a commercial bank for proper management of financial transaction. There should be guidelines on i) formation of new committees, ii) actions against members at fault, iii) duration of membership, and iv) responsibilities of different types of members that are involved with various CBOs. A well accepted regulation for CBO would reduce dependency on implementing / external agency for development.

#### **2.4.3 Availability of low cost technology**

The implantation policy of WSS in low income urban community is that the community will share a part of the total investment cost and the full of operation and maintenance cost. The high cost technology means high cost sharing by the community and high skill required to operate the system. Therefore, it is imperative that the poor community may not be interested to participate in such project which involves technologies which is not affordable to them. Thus in order to ensure sustainability, the project should choose a technology which is low cost technology and at the same time reliable

#### **2.4.4 Fulfilment of basic needs**

A substantial part of the community in low income urban communities is hard core people. The figure varies from 25- 40 percent of the slum population. The priority for them to meet the basic needs such as food shelter and clothing etc., the other needs get less priority. Therefore the people who are struggling for earning basic

need are found reluctant to get involved in water and sanitation development which are not at the top of their priority list.

## 2.5 Community Management of WSS Interventions

Community management is an approach that seeks to make the best use of resources available within the community with support from sector agencies. It puts people in charge of their own water systems in flexible partnership with supporting agencies. In this, communities or user groups take on more tasks and responsibilities, relieving agencies of routine management and maintenance duties. Experience in many developing countries shows that even very good water agencies cannot successfully operate and maintain a network of widely dispersed water systems without the full involvement and commitment of the users. This resulted in a strong push towards decentralization of the management affair. However, much of this learning is at agency and institutional level as they often still control funding and so can dictate developments. Increasingly governments and institutions are trying to adopt a more integrated and demand responsive approach. This is stimulated by the growing pressure to focus on sustainable functioning and effective use of water supply and sanitation systems. Another reason why government agencies are searching for alternatives and are working to stimulate participatory approaches is that over the past two decades the so-called “blue print” development strategies have been shown to be ineffective in meeting the basic needs of large numbers of marginalized, vulnerable people (Thompson, 1995). Thus public sector agencies show growing interest in participatory approaches, involving the community in their attempt to do more with less financial resources. They develop, for example, links with NGOs who have been using similar types of approaches.

Community management does not imply that the communities must take care of everything or pay the full costs. **Management** is a concept that is very much in development and is changing to sharing responsibilities in new ways. Team learning develops the skills of groups of people to look beyond individual perspectives. It requires a positive learning environment. This is not easy, particularly in a politicized environment such as the water and sanitation sector. Not only are good facilitation and a variety of techniques required, but also leadership training for group members and a review of the historical developments with the community. This requires building confidence and trust, helping them to become self-confident and gain self-esteem. The community is not the only actor, but can benefit from partnerships with the water sector institutions and the private sector. There is no blue-print what the inputs of different actors can be in the different project stages. What may be expected is that the role of the government or NGOs who initially are the project leaders will reduce over time and the role of the (community) water enterprise (water committee, users association, private enterprise etc.) will increase. The agreed division of tasks and responsibilities requires informed decision making which particularly addresses the expected service level and the long term management and possible extension of the system.

The essence of community management of water supply systems boils down to: Who manages (decides) what, with what tools and with whose support so that the community as a whole benefits. The object of management is to ensure a proper functioning water supply system. This system needs not only to overcome the hygiene risk the community faces from the existing water systems, but also to provide the level of service the community wants, is financially willing to support and for which an adequate management system can be found. New systems can only compete successfully with existing sources, if a better level of service can be provided in terms of coverage, quantity, continuity, quality and cost (Visscher, 1997). To sustain the performance of the system some organization has to be established to manage the task at hand. This can very well be a community based organization providing an enabling environment is available.

### 2.5.1 Project Cycle in the context of WSS interventions

Like any development project community based WSS interventions can be put in a number of sequential steps calling a project cycle. For smooth implementation of a project the key is effective management. Simple definition of management is the systematic approach of planning, directing, and controlling of the resources for getting maximum outputs against the inputs. For water supply and sanitation projects, the basic stages are:

- Project Planning;
- Project Design;
- Project Implementation;
- Operation and Maintenance; and
- Project Evaluation and Monitoring.

Figure 2.4 depicts a typical project cycle in the context of WSS interventions.

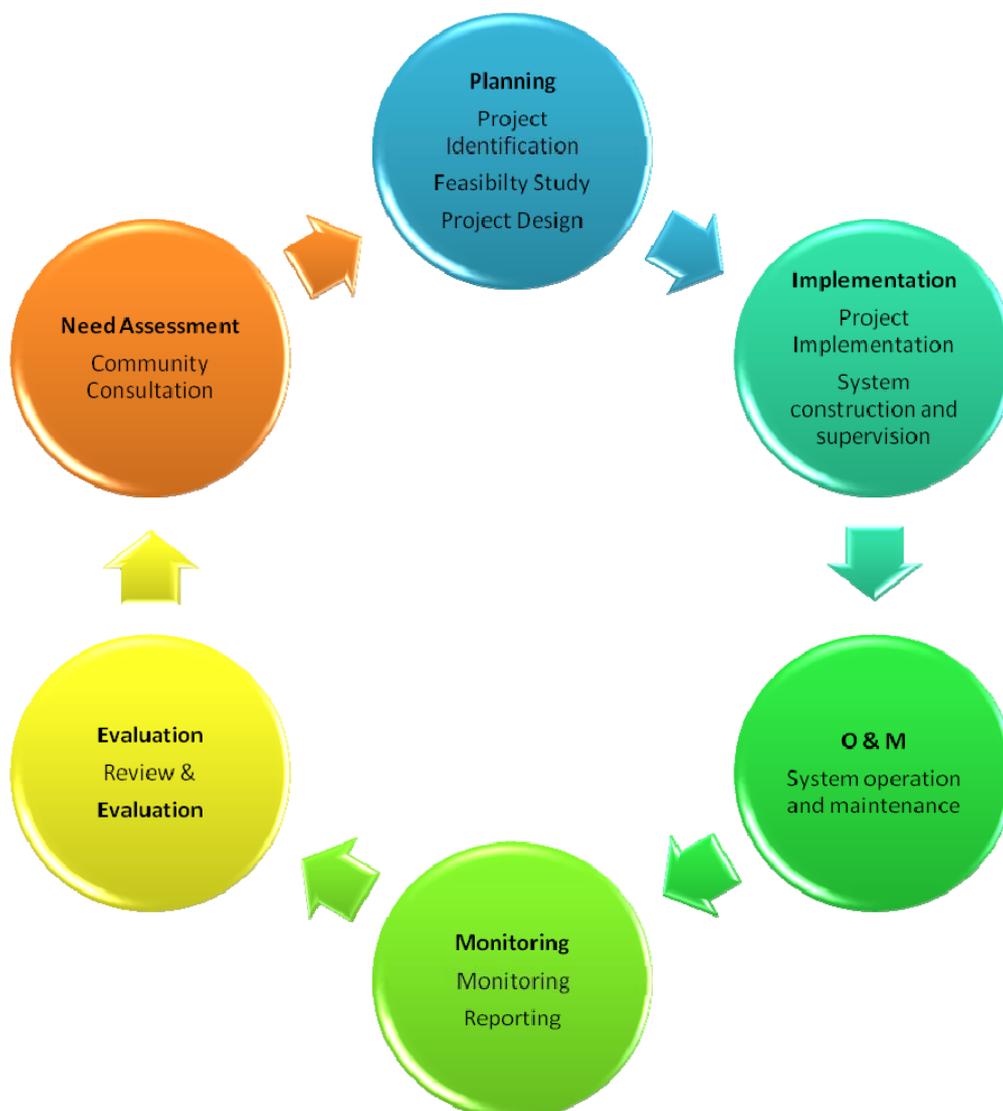


Figure 2-4: Project cycle in the context of WSS interventions

## 2.5.2 Community participation in conceptualization, formulation, planning and design

### **Stages of Participatory Planning:**

The key stages to be considered for participatory planning are:

- Assessment of existing situation;
- Identification of problems;
- Awareness and need for the facilities;
- Setting target for service coverage and service standards;
- Assessment of resources that are required to meet the target;
- Determination of constraints and opportunities; and
- Set the plan in realistic terms.

In each of the stages of the mentioned planning, participation of the users/community should be ensured for effective implementation and subsequent operation & maintenance of the facilities.

### **Need Assessment Stage:**

While the needs of target population will be assessed the participation of different stakeholders is highly crucial. Here the word 'stakeholder' covers parties who either affect or are affected by the project actions and policies.

It will ensure that fundamental questions are asked and weaknesses are analyzed in order to provide decision-makers with accurate and more relevant information about the needs of beneficiaries and other stakeholders. On the basis of available information, the existing situation is analyzed; i.e. the major problems are identified and the main causal relationships between these are visualized in a problem tree.

Consultation with the community is the basic means of giving the community some voice and involving it in decision-making. Main rationale is to ensure that the project or programme introduced by the outside agency is adapted to meet the needs of community members, and to avoid difficulties in implementation. It may involve:

- a. Consultation with community representatives or leaders only. It may well be considered that such consultation does not amount to real community participation unless the community is one where the decisions formally made by representatives or leaders are the result of wider consultation and consensus within the community, and unless the community is thereby involved in decision-making on significant aspects of the project which is being introduced.
- b. Consultation with all sections of the community. This is primarily a matter of ascertaining the views of those sections of the community, which may normally be excluded from decision-making (women, certain ethnic minorities or low caste groups, the poorer sections), whose interests may not be genuinely represented in the existing processes of decision-making in the community. The rationale: to ensure that the project meets their needs also. This is not always easy, and there are differing views on the emphasis, which can or need be given to it.

**Project Identification:**

Project identification is the stage at which the initial project is conceived and formulated. At this stage the perspective should be very wide. The information available is usually very limited. In the project identification phase, the main justification for the project, the description of potential target groups and external factors which are likely to influence the project, are more important elements than questions of choice of technology and ways of organizing the project. It is very important that all types of beneficiaries and stakeholders should be involved with the entire process by following a systematic methodology of stakeholders' participation.

**Feasibility Study:**

A feasibility study includes the data collection, analysis and assessment necessary in order to prepare for project design. The feasibility study should not go into details on anticipated activities and inputs in the project itself, but provide a thorough background, with information.

**Project Design:**

During project design the basic project structure, the main external factors and some of the main elements of the monitoring system are identified. It would bring together different parties that are involved with the project at decision-making and management level. This would help to create a common understanding about roles and responsibilities of different beneficiaries and stakeholders. In this phase addressing gender needs and empowerment process would be carefully checked and incorporated.

### **2.5.3 Community participation in implementation**

When the main characteristics of the project have been established, it is appropriate to make a detailed implementation plan for the project itself, its intended outputs, activities, and inputs, as well as its monitoring system, time schedules and budget. The stakeholders' participation should be ensured in/at all stages. One should ensure that the monitoring system designed during the detailed planning will provide a basis for the monitoring not only of physical progress but also of the extent to which objectives are met, i.e. the effect of the project on the target groups and other affected groups. During the preparation of implementation plan, stakeholders' involvement at different stages has to be specified through the proper consultation and participation of relevant stakeholders.

### **2.5.4 Community participation in O&M, monitoring, reporting and evaluation**

Monitoring is the continuous or periodical surveillance of the implementation of a project. There should be one format for monitoring and reporting throughout the life of the project. This will help to provide a solid basis for analyzing trends and defining strategies, and will be particularly useful when there is a change of personnel, management and decision-makers. Monitoring format should be prepared in a manner that the beneficiaries and other stakeholders of the project can participate in progress monitoring. The format of progress report should be such that inputs, activities and outputs are monitored with a reference to the immediate and development objectives. Indicators should be user friendly i.e. all stakeholders can understand and participate in monitoring and reporting of the project results. Collaborative project evaluation techniques should be used where stakeholders also participate with the external evaluators. In all these cases or situations the issue of representativeness must be considered i.e. men, women and children's participation must be ensured. The participation issue should also be seen from gender and child rights perspectives.

## 2.6 Gender Aspects in WSS

### 2.6.1 What is Gender

The term gender describes the social relations between and characteristics of women and men. It concerns men's and women's participation in the determination of their lives including access to rights, power and control over resources. Gender suggests a defined role of men and women in development activities of a community. Gender also means a social relation between men and women to create a 'win-win' situation.

### 2.6.2 Gender Approach

A gender approach means that different roles and responsibilities, attitudes, needs and function of men and women will be taken into account. It takes account of ethnic group: rich and poor, young and old, wealth and age. The main feature of a gender approach is that it reviews the needs and possibilities to fully involve both men and women in water and sanitation improvements. A Development programme can affect different sections of a community (e.g. richer-poorer, younger-older men-women) in different ways. A gender approach helps to predict – and take action to improve – how different members of a society will be affected by development efforts and to what degree they will be able to participate and benefit from the efforts. It looks not only at roles and activities but also at relationships. It asks not only who does what, but also who makes the decisions and who derives the benefit who uses the resources such as water, land, credit, and who controls these resources. The existing gender roles and relations that can be seen in reality are as follows:

#### Women:

- Collect and carry water
- Use water in various purposes (cleaning washing cooking)
- Manage all household activities
- Caring children (washing, feeding)
- Perform productive activities such as vegetable growing, farming, cattle nursing etc.
- Use toilets but do not have access in decision making on water and sanitation activities

#### Men:

- Men influence, plan and decide on process of water sanitation activities at both household and community level;

### 2.6.3 Constraints in Women Participation

- Women have less influence and opportunities in decision making process at both household and community level;
- Limited access to information: Women are usually informed and influenced by their husbands and therefore, they get either distorted or wrong information. Communication and information dissemination towards women are poor;

- Women have no technical and management skills for installation, O&M, repairing of water and sanitation facilities;
- Lack of appropriate sanitation technology for women (safety, privacy)
- Lack of hygiene education but responsible for all sanitation activities and male partner usually do not share.
- Attitude towards women is not always positive.

#### 2.6.4 Gender issues in Water

Some specific issues pertaining to women participation related to water supply projects are illustrated in Table 2.3

**Table 2-3: Specific issues pertaining to women participation related to water supply projects**

Project activity	Gender issues
Site selection of water points	Site location and distance <ul style="list-style-type: none"> <li>◆ Impact of time and energy to fetch water from long distance</li> <li>◆ Girl children often participate in collection to help women at the cost of their health and schooling.</li> <li>◆ Impact on other productive activities such as farming, cattle nursing etc.</li> </ul>
Consultation and decision making	Planning: Investment, selection of technology, sustainability etc. <ul style="list-style-type: none"> <li>◆ Man makes the decision. Women often do not have access to information, knowledge, choice and ownership.</li> </ul>
Construction	Provide labour and support to construction team <ul style="list-style-type: none"> <li>◆ Men participate in technical and hardware related activities while women provide physical labour and food for construction team. These impacts on their time health and ability to undertake existing roles.</li> </ul>
Operation and Maintenance	<ul style="list-style-type: none"> <li>◆ Women have often the greatest interest on timely and adequately operational and maintenance yet they often do not have sufficient influence on water management committee etc. to bring this about.</li> <li>◆ Women are often excluded from undertaking O&amp;M tasks</li> </ul>
Community Management	<ul style="list-style-type: none"> <li>◆ The absence of women and women's voice in WPC impacts on knowledge of the problems experienced by users.</li> </ul>

#### 2.6.5 Gender issues in Sanitation

Gender analysis is vital at the beginning of the project to understand the need of men and women of the community. Due to cultural and gender boundaries women are reluctant to discuss excreta disposal and hygiene practices specifically menstruation in a group of men and women. Therefore, identification of technological and design requirement that suits the different section of users (women, girls children men aging member etc) in terms of culture and tradition becomes difficult.

Women and girl children in particular face severe and detrimental problems of personal safety, privacy hygiene and health in relation to the use of latrine at home, at school and traditional paces for excreta disposal for example defecation fields.

A particular problem is related to the fact that women often have to wait until darkness to defecate and pass urine. This has a number of detrimental effects: i) security in terms of fear of rape and harassment and ii) health in terms of diet and the risk of infection that may affect future fertility.

Equally invasive are issues of privacy and personal hygiene related to menstruation, washing and bathing. At school there are often no facilities for menstruating and where latrines exist they are often expected to share facilities with boys. Such problems are compounded where there is also a lack of water for hygiene and sanitation.

### **2.6.6 Overcoming the Gender issues**

- Apply gender approach from the very outset of the project;
- Analyze problems in the light of different kind of empowerment.
- Involve women in money generating activities which in turn would facilitate their empowerment.

There are examples in the slums where women are involved in the construction work of WSS program as a contractor. They buy materials from market build facilities and making profits.

- Arrange education for women and particularly girl children for real empowerment;
- Arrange hygiene session for both boys and girls;
- Educate men to give value of the women's work that they render in the family such as farming, handicraft, embroidery, cattle nursing etc. particularly in terms of economic value.
- In Hajighona, all CMC committees are equipped with female members and it is found that all committees are functioning well and have well acceptance among the slum dwellers. The participation of women is quite high in WSS activities. They earn good reputation for their sincerity and seriousness. They are also doing good jobs in purchase committee and in revenue collection.
- Involve women in different CBO or management committee where they can appropriately play in decision making.
- Attach priority to solve women's problems and limitations
- Involve men to perform jointly in common O&M tasks.



# Chapter 3

## INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTING COMMUNITY BASED WSS INTERVENTION

### 3.1 Introduction

Community management is a process that seeks to make the best use of resources available within the community with support from external agencies. It puts communities and user groups to take overall tasks and responsibilities, routine management and maintenance duties. As a result, it ensures community participations through adopting cost-sharing approach and introduction of economic pricing for services. Successful community management leads towards building community confidence and to stimulate wider development efforts. Community-based management system may contribute to create a good governance atmosphere in the area through ensuring accountability of the members and transparency of the process. It may also significantly restricts the opportunities for malpractice and corruption.

### 3.2 Existing Institutional Arrangement

The key to the success of the WSS innovative processes is the active involvement of the community members themselves in all the phases of the project cycle, including planning, implementation and monitoring. Active participation of the general people depends on the level of involvement of individuals within the communities for carrying out various WSS activities. Therefore, people of the communities are encouraged to be involved with the WSS innovative processes for providing water supply and sanitation services in the urban poor areas. The management system framework has been introduced to keep transparent the process of selecting members for various community level committees and make them accountable to other inhabitants in the community; it

leads towards establishing good governance in the community. It increases the self-esteem of the members that are involved with different CBOs and also provides positive impacts on increasing the social status of the members.

### **3.2.1 Formation and functions of Community Based Organizations (CBOs)**

There are two tiers management committees in most of the urban poor areas for the implementation of WSS innovative processes at the community level. Two tiers management system has been developed and introduced by the implementing NGOs for establishing a methodical and planned institutional and organization mechanism that will ensure easy access on WSS facilities among the beneficiaries in the community. The two tiers management system has been introduced for ensuring proper installation, operation and maintenance (O&M) and sustainable use of WSS hardware facilities in the community. The management system also guides on financial aspects relating to the WSS innovative processes.

The two tiers management mechanisms are:

- a. Community Based Organization (CBO), and
- b. Need Based Committee.

#### **Community Based Organization (CBO)**

The Community based organization is the top level management committee and main functioning body of a community, which is usually known as slum in urban poor area. CBO plays the active role to implement WSS innovative process in the community. Normally, social and political leaders, elites and influential persons are the members of CBO. The overall development and improvement of WSS situation is highly depended on active functioning of CBOs. The committee maintains regular communication with the relevant government organizations and other stakeholders at the upper level and provides continuous guidelines among the inhabitants for ensuring sustainable use of WSS facilities.

The top level management committee of a community is usually known as Community Based Committee (CBO). People of different communities have given different name of CBO though the functionalities of those committees are same. In some places, it is known as Slum Development Committee (SDC), Advisory Committee, WATSAN Action Committee, and Management Committee etc. The overall progress of different WSS activities mainly depends on effective functionalities of CBO in the urban poor areas. In some of cases, it is also known as User's committee (N-03)

A systematic management mechanism is followed in formation of CBOs. In the community, CBO is formed through a mass gathering, which is popularly known as the "Projection Meeting". All male and female persons are individually attended on the meeting. People provide their efforts for the development of an action plan for the improvement of the overall WSS situation in the community. The community follows participatory decision making approach to implement various activities relating to water supply and sanitation at the community level. The action plan included Water, Sanitation and hygiene activities and also considered other social and infrastructure issues.

The implementing NGO/agency plays the key role to encourage people in the community taking cooperation of the community leaders. They involve the community leaders as those leaders have influence among the people and people have trustiness on their decisions. Therefore, the implementing NGO/agency arrange

projection meeting in the community and work together with the community leaders to ensure maximum possible participations of the slum dwellers in the event. All males and females are equally invited to attend in the massive gathering. In most of the cases, women are especially encouraged to participate on the decision making process and to be involved with different community based committees.

Normally, males and females gather on a project meeting/general assembly for selecting members of CBOs in the community. One person from each household is allowed to take active role in the decision making process. The usual practice is that male are selected as the members of the central level committee (B-01, B-09 & N-05); however there is exception to incorporate women with the top level management committee in a community. There are no preset rules to restrict the number of the members for formation of CBO. In general, the committee members of each CBO are 5-15. Most of the cases there are 10 members in each CBO in a community.

In general, each CBO is formed for one year tenure; however in some cases, community selects the members of the CBO for two years (B-07). There are also have exception like in Dhulikhel in Nepal, the user's committee is elected for four years (N-03). Actually community people decide the duration of a CBO with the assistance of the project implementing NGOs/agencies. All the members of CBO are directly selected by the community. Usually, a new committee is formed after completion of the tenure of the previous CBO. The major positions of the working committee are president, vice-president, secretary and treasurer (N-05 & B-02).

In Nepal, there are different type of practice for O&M of WSS services. Besides the committee, there are additional staffs in charge of day-to-day operation of the system (N-03 & N-05). The number of staffs varies from case to case; the range of hiring staffs is 3-16. In addition, an accountant is also hired on part time basis with the primary responsibility of collecting water tariff. However, in the case of Bangladesh, usually members of water and sanitation management committees provide voluntary services for O&M of WSS system. In some cases, the WSS management committee hires a caretaker for day-to-day operation of the system (B-01).

### **Major responsibilities of CBO**

The community based organization is mainly responsible for the improvement of overall water supply, sanitation and environmental situation in the community. The committee provides their efforts for establishing and confirming easy access to WSS facilities and hygiene practices among the poor urban people living in slums. The members of CBO meet on a regular basis. Though the committee itself decides the frequency of organizing meetings, in general, CBO arranges meeting once in every three months. However, the members of CBO also meet on an emergency basis, if required. The representative of the implementing NGO assists CBO to provide technical and management support and helps the committee to focus on the key issues regarding water supply and sanitation. Main responsibilities of CBO are mentioned below:

- Maintain regular communication with the local government organizations for taking possible utility services from the relevant government sectors
- Liaison with local power structure to facilitate smooth functioning of WSS activities in the community
- Maintain regular liaison and communication with the implementing NGO to stay abreast of the issues of management of WSS hardware.
- Ensure security and protect the water points and sanitation latrines from illegal power users/musclemen/mastaans
- Assist and facilitate in selection of site for installation of the water points/stands and sanitary latrines.

- Facilitate to form a purchase committee to buy raw materials for the construction/installation of water point/stand, sanitary latrines etc.
- Facilitate to form water supply and sanitation management committees for sustainable use of hardware in the community
- Provide required guidance in construction/installation of hardware and taking security measures
- Resolve various types of problems that occurred in the community and the water and sanitation committees were unable to reach on any solution.
- Facilitate on preparing action plan and execution of establishing WSS hardware

### **Member selection criteria**

As CBO plays the vital role to implement various WSS activities in the community, the members of CBO has been selected carefully by the general people through the projection meeting, which is basically a massive gathering of the inhabitants living in one place. The overall water supply, sanitation and hygiene practices situation cannot be changed in right directions and ensured easy access of WSS services in the community unless CBO can be functioning effectively in the community. CBO has to maintain strong liaison with the government organizations and also with local power structures for receiving their supportive attitudes to get WSS services in the unauthorized places. Therefore, selection of members for CBO is a major concern in the community. Usually people keep some important issues in mind while selecting members for CBO. It means, the members of CBO should have some preset qualifications to become a member of CBO. The member selection criteria are mentioned below:

- i. Leadership quality
- ii. Influential capability
- iii. Willingness to work
- iv. Social acceptance of the person
- v. Management competence
- vi. Sound communication skills
- vii. Initiating & maintaining public relations
- viii. Negotiation proficiency
- ix. Capacity to comprehend and implement WSS related activities
- x. Ability to realize socio-economic and cultural aspects of the community

### **Legal Recognition of CBOs**

The main strength of the WSS innovative processes is the proper management of different community based committees both at the horizontal and vertical ways. However, most important issue is that these community based committees do not have any legal recognition. CBOs are mainly functioning based on mutual understanding with relevant government organizations mostly with the local government bodies and implementing agencies. A committee cannot be legally obligated to others unless its activities are legally controlled by government laws. The members of a committee wouldn't be accountable to the community unless restrict their power through the government regulations. The long-term functioning of a community based committee can only be ensured through providing legal entitlement of the committee.

According to the various WSS innovative practices, the existence of CBOs would be ensured till the end of a particular WSS innovative project. After the completion of project duration the further continuation of such committees would be uncertain and depend on the interest of the people living in the community. Therefore,

the future continuation of existing WSS practices would be in high risk and the process wouldn't be sustainable in longer period while external support would be withdrawn from CBOs. In this regard, there is a need to identify an effective and acceptable way to provide such type of legal entitlement of the community based committees for sustaining the innovative process in the long run.

Without having legal entitlement, the CBOs are not allowed to open a bank account to any commercial bank. In some cases, the implementing agencies arrange special arrangement for CBOs to collecting monthly installments and water tariffs from the beneficiaries on a monthly basis. People are also interested to create a saving fund by collecting money on a monthly basis from the inhabitants and preserve on a bank to ensure security of the collected money. Otherwise, these committees will not be able to keep fund in a secured way. Community based committees require legal recognition to open a bank account to ensure transparency of the financial transactions (B-01).

Organizational development of WSS innovative process can be considered as one of the major components that provide positive impacts on ensuring sustainability of the initiative. Therefore, the overall success of any innovative approaches has direct linkage with legal recognition of CBOs. In some cases, the local government has provided legal recognition to CBOs or user committees to encourage and ensure people participation for sustainability of any WSS innovative process. In those areas, CBOs have received legal registration from the local government organizations like Sirajganj Poursava in Bangladesh (B-06) and Butwal Municipality in Nepal (N-08). Another example is, in Nepal, Dhulikhel Drinking Water Users' Committee is fully autonomous body in all respects. It is running under its own constitution registered in the respective Government institution. The municipality represents as one ex-officio member of the committee in order to ensure coordination and cooperation between the municipality and the committee. All the decision of the committee meeting is disseminated through notice board of the users' committee office (N-03).

In Sirangonj, all CBOs have legal recognition as all CBOs are enlisted by the municipal corporation. A registration number is provided to each CBO from the municipality. Most interestingly, all the members of CBOs are elected; it means CBOs is an elected body. Municipal Corporation is responsible to declare election dates to organize yearly election in different communities and formation of CBOs under municipal areas. Legal registration of CBOs has ensured legal status of such type of committee, which is considered an essential issue for ensuring sustainability of CBOs and its activities in the communities.

### **Regulation of CBOs**

CBOs are functioning properly in the community to facilitate the beneficiaries through receiving water and sanitation services under direct supervision of implementing agencies. All such committees are functional based on verbal understanding among the inhabitants and guidance from external support agencies. According to the verbal agreement, each CBO would be functioning for one or two years. New committee would be form after completion of the tenure of the previous committee. The members of different CBOs take decisions for inclusion and exclusion of members. It means CBOs hold the right for selection of new members, if anyone resigns from the committee. Such type of practice discourages others to provide voluntary services into the area and involve with any of such committees (B-01 and N-08).

It can be considered as a serious obstacle to ensure sustainability of the process in the long run. People of the community have expressed interest for the development of a comprehensive regulation for each committee, which would provide positive impact to sustain the management procedure in the long run (B-01 and N-08). An acceptable regulation to form CBOs is needed to ensure transparency of WSS activities executed by the CBOs. The development of a comprehensive regulation for formation and functioning of different types of

community based committees is one of the essential features to ensure long term sustainability of the watsan innovative process.

### **3.2.2 Development of Management Committees**

#### **3.2.2.1 Cluster Based Management Committee**

In large urban poor areas, only formation of a CBO wouldn't be enough for the arrangement of legal water supply connections and establishment of sanitary latrines in the area. CBO is a small but powerful committee and its major responsibilities are to provide appropriate guidelines to other community level organizations to take appropriate actions for ensuring easy access of water supply and sanitation services at the community level and maintain regular liaison with different power structures including government, politicians and local mastaans. The committee also provides efforts to influence and manipulate the government organizations and others to get legal permission for installation of WSS hardware inside the slum areas. Hence, CBO is basically worked at the policy level and plays visionary role on overall improvement of existing environment in the slum areas through adopting legal water supply and sanitation facilities for the inhabitants.

Therefore, the overall situation has provided an indication that formation of one CBO in a large slum area wouldn't be able to serve the entire inhabitants in effective manner. Thus, the implementing NGO splits the large slum areas into some clusters for proper handling of various WSS activities in more efficient ways and also establishing a systematic management process in the community.

There is no hard and fast rule of dividing a large area into a fix number of clusters. The entire slum areas divide under different clusters according to the convenience of the geographic location, manageable size and facilitating the management tasks. Usually arrangement pattern of different houses is considered as the key issue while segregate a large area into different clusters. Usually all adjacent houses are considered within one cluster. The general size of a cluster is around 80-100 households.

According to WSS interventions in urban poor areas, there is a cluster committee in each cluster, which works under direct supervision of CBO. It means CBO guides all the cluster committees of a large area for implementation of WSS activities at the field level. The implementing NGO and CBO jointly take initiative to form a cluster level committee to serve the people living in the cluster in more effective ways where general people also play the active role at the decision making process and their voice are reflected though selecting members of the committee. The people of the community directly participate at the decision making process and select the members of CDC. Usually, a cluster based committee is known as "Community Development Committee (CDC)". There is one CDC functional under each cluster in a large slum area.

Each CDC comprises of 11 members that are selected from the same cluster. Gender is not a priority issue while forming a CDC in each cluster. However, some of the NGOs strictly promote and follow the gender aspect into the management process. ARBAN, a national level NGO in Bangladesh, keeps compulsory provision of incorporating at least two women in each CDC. (Ta Block, pg 3-4, 6 last and first para)

At the beginning, each CDC works hard for the development of a community based action plan. It follows absolutely a participatory approach where the community analyzes overall situation of the particular cluster and identify required water and sanitation services for ensuring better living conditions into the area. The people of the community identify the required number of water points/stands and sanitary latrines to ensure cent percent watsan coverage in the area.

The cluster level action plan is designed by the community with taking direct assistance from the implementing NGO; it is known as Community Action Plan (CAP). All the community level activities are followed based on CAP. The implementing NGO provides their efforts to cross-check the hardware issues and finalized the plan in mutual understanding with community.

According to the management procedure that follows in the urban poor areas, CDC would be functional under direct supervision of CBO and CDC would provide required guidelines to the need based organizations to continue their WSS related activities in the fields. Main responsibilities of CDC are mentioned below:

- Maintain regular communication with CBO and the implementing NGO for the improvement of WSS situation in a particular cluster.
- Liaison with local power structure to facilitate smooth functioning of WSS activities in the community
- Provide necessary guidelines to the Need Based Organizations as those committees are functioning under direct supervision of CDC
- Assist and facilitate in selection of site for installation of the water points/stands and sanitary latrines.
- Take joint initiative with CBO and the people of the community to form a purchase committee to buy raw materials for construction of water point/stand and sanitary latrines hardware.
- Facilitate to form water supply and sanitation management committees for sustainable use of hardware in the community jointly with the community and CBO
- Monitor the progress of hardware construction in the community and provide required guidance to the constructor of the construction materials
- Take necessary security measures for WSS hardware
- Resolve various problems occurred in the community and the water and sanitation committees were unable to reach on any solution.
- Facilitate on preparing action plan and execution of establishing WSS hardware



*Figure 3-1: Two tier Community Based Management System*

### **3.2.2.2 Need Based Organizations**

In a community, the central level management committee is actually provide advisory services to the people for ensuring easy access to WSS facilities in the area. CBO is a strong committee and have influence among the inhabitants living in the area.

Under CBO, there are many need based organizations that are formed to execute various WSS activities in the area. The members of CBO and the general people of the community select new members for the need based committees. Some of the implementing NGOs encourage both men and women to be involved with the need based committees for ensuring easy access of WSS services in the community.

In Bangladesh, many NGOs are experiencing various management mechanisms for implementing different types of community led WSS interventions at the field level. According to the research findings, NGOs came with a conclusion that females are more responsible and capable for the proper management of community level activities. Therefore, those NGOs only encourage females to be involved with different types of need based committees. According to the different WSS interventions, there are three types of need based committees that are functioning under the central level management committee. These are:

- a. Purchase committee
- b. Water Management Committee, and
- c. Sanitation management Committee

#### **Purchase committee:**

Through a mass gathering, people of the community identify the required number of water supply and sanitation hardware that would be useful to ensure easy access of WSS facilities in the area. The implementing NGO assists them to recognize the required numbers of WSS hardware based on internal and external available resources and financial ability of the inhabitants. While community takes decision for the installation of hardware, a temporary committee is formed for each WSS hardware establishment under the direct supervision of CBO for buying required materials for the construction of the hardware. It is known as the Purchase Committee (PC).

The purchase committee is a provisional arrangement where the members of the committee are selected by CBO and the people of the community, specially the target beneficiaries of WSS hardware. One purchase committee is formed for the construction of one WSS hardware option. As PC is a temporary committee, it doesn't have fix-term duration to be functional in the community. In general, the committee would be functional till the end of constructing the WSS hardware and handed over to the target beneficiaries. PC is responsible to buy required hardware materials from the market for construction of water supply and sanitation facilities in a community.

Usually the size of a purchase committee is 3-5 persons. In addition, the implementing NGO engages two representatives from their end to assist PC in purchasing required WSS materials. In general, a Community Health Worker and Unit Manager assist PC to buy required materials from the market and transfer to the WSS hardware installation site. Mainly the representatives of the implementing NGO are carrying out the cash and pay the bills accordingly. The members of the PC are not allowed to carry cash with them for purchasing required materials from the market. PC also plays active roles on assigning contractor in close collaboration with CBO, monitor the progress of the hardware installation activities and take necessary measures for ensuring security of the materials etc.

Before purchasing WSS materials from the market, the members of the purchase committee collect different price quotations from the markets/places, verify the price of each item and then buy the construction materials. While completing one hardware installation, it is then handed over to the ultimate beneficiaries, the user of the community. The Purchase committee would be automatically resolved after handing over the WSS hardware options to the beneficiaries.

The members of the committee can be male, female or both. In the case of Bangladesh, most of the NGOs promote females to be involved with the purchase committee. In reality, all the members of most of the purchase committees are female. In some cases, there are both male and female on the committee. Most interestingly, there is no purchase committee which consists of only males.

***Main features of a Purchase Committee:***

- Size of the committee : Three – Five
- Externals : Two from the implementing NGO
- Duration : Short term (till the completion of installation of WSS hardware)
- Responsibilities : Collect price quotations, Purchase raw materials, selection of the contractor, monitoring progress of the hardware installation etc.
- Sex : Mainly women of the community
- Motto of the initiative : Community mobilization and women empowerment

**Water Management Committee:**

In the slum areas, population density is extremely high. Many families live in a small place due to socio-economical constraints. After considering the population size and availability of space and affordability of the inhabitants, the community and the implementing NGO take joint initiative for the installation of a water point that would be used by the people of a particular community in the slum. In general, total 15-30 households use one water point/stand in a community.

There are several water points/stands in a slum. The number of installation of water point/stand depends on the size of the population. People of each community basically collect safe water from one place. The users of the water point/stand are responsible for O&M of the hardware. They are also responsible for repaying the capital costs according to the cost-sharing strategy and make the payment of the monthly water tariff. Responsibilities of the water management committee are laid with management and maintenance of the water source. Therefore, considering the importance of ensuring easy flow of safe water in a community, formation of a water management committee is found essential to ensure long term sustainability of the water point/stand.

The water management committee takes part at the decision making process with the advisory committee at various stages including selection of site, construction work, maintain liaison with local power structures for the smooth functioning of the water services.

In the case of Bangladesh, NGOs emphasize the issue of women empowerment. NGOs constantly encourage women to play active role in the society for the improvement of their socio-economical conditions, taking part in the decision making process and ensuring vigorous participant at the management level to implement various WSS activities at the grassroots level (B-06). In general, the members of the water management committees are 100% women in Bangladesh. The women members of the water management committee are successfully carrying forward various activities relating to the water point.

The water management committee comprises 10 women among the beneficiaries of each water point/stand. There is a president, general secretary and cashier in each committee and others are involved as members. The members of the water management committee are selected through a general meeting, where the members of CBO/CDC and the target beneficiaries of each water point jointly select the members of the water management committee. Each committee is formed for one year. General rule is that the committee would be reformed after completing the tenure by the previous committee.

The main responsibilities of the water committee are mentioned below:

- Management and maintenance of the water point;
- Ensure regular collection and payments of agreed percentage of the capital cost and water tariff;
- Repair and maintenance of water points;
- Ensures safe & security of the water point; and
- Keep regular communication with CBO
- Maintain cordial relationship with the beneficiaries of the water point/stand; and
- Arrange monthly meeting

Usually, the implementing NGOs select one supervisor in each community. The supervisor closely works with the water management committee and assists them to collect monthly installment costs and water tariff.

#### **Sanitation Management Committee:**

Still 80s, there was no provision for systematic defecations inside the slum area for the people. People were used to go for open defecation, which contaminated the overall environment of the area and people were affected with skin and different types of water borne diseases. Unhealthy situation has been changed after taking initiative for the installation of community based sanitary latrines inside the slum areas.

The implementing NGO and the ultimate beneficiaries jointly take decisions for installation of sanitary latrines within each community. There are different types of low-cost technological options for installation of sanitary latrines in the slum areas. Mainly, the ultimate beneficiaries take the active role to select the site and a suitable technological option for installation of sanitary latrine at the community level with direct assistance from the implementing NGO.

Cluster latrine and sanitation block are the most used technology in the slum area. There is two, three and four chambers cluster latrine in the community. It depends entirely on the population size of a community. On an average, one chamber of a cluster latrine is used by 10-15 households. The sanitation block is a larger version of the cluster latrine having water used option within the compound of the sanitation block. These are shared sanitary options for introducing systematic sanitary latrines in the community. Proper maintenance of the sanitary options is essential to ensure sustainable use of sanitary options. It has direct linkage with personal hygiene practices. Therefore, the people of the community form a separate sanitation management committee for each sanitation technology options in the slum area.

The sanitation management committee also comprises of 10 women among the beneficiaries where there has a president, general secretary and cashier and others are involved with the committee as general members. CBO and the target beneficiaries jointly select the members of the sanitation management committee through a

general meeting. Each sanitation management committee is formed for one year tenure. Usually the committee meets once in every month.

In Bangladesh, NGOs are always promoting the concept of women empowerment. NGOs are continuously encouraging women to play key role at the decision making process and vigorous participant at the management level to implement various WSS activities at the grassroots level. In Bangladesh, the hundred percent members of the sanitation management committees are women. The women members of the sanitation management committee are successfully carrying forward various activities relating to the water point.

The responsibilities of the committee are as follows:

- Overall management of the sanitation block/cluster latrine
- Regular collection and payments of agreed percentage of the capital cost;
- Ensure cleanliness of the sanitation block/cluster latrine
- Repair and maintenance of sanitation block/cluster latrine;
- Ensures safety & security of the sanitation block/cluster latrine;
- Arrange monthly meeting;
- Maintain regular communication with CBO; and
- Maintain cordial relationships with the beneficiaries of the sanitation options

**Table 3-1: Role of the stakeholders**

Stakeholders	Main Activity
Community Based Committee (CBO)	<ul style="list-style-type: none"> <li>• Preparation of Community Action Plan</li> <li>• Regular communication with implementing agency, local government body</li> <li>• Selection of members for Management committees</li> <li>• Selection of contactor</li> <li>• Guide the NBO &amp; W/SMC</li> </ul>
Water/Sanitation Management Committee (W/SMC)	<ul style="list-style-type: none"> <li>• Distribution management of WSS facilities</li> <li>• Maintenance of Hardware</li> <li>• Collection of monthly fees</li> </ul>
Purchase Committee	<ul style="list-style-type: none"> <li>• Purchase hardware materials for the construction of WSS Hardware</li> <li>• Supervision of construction activities</li> </ul>

### 3.3 Capacity building on WSS

Usually the project implementing agencies take different initiatives for the capacity building of the general people on water supply, sanitation and hygiene issues. The main purpose of most of the WSS innovative processes is to encourage the target beneficiaries to play an active role for receiving WSS services at the community level. The community wouldn't be benefited from the WSS innovative processes unless they properly understood the significance of such initiative.

In urban poor areas, people are basically living in unhygienic situation. In general, people do not have knowledge on health and hygiene issues and the consequences of living in polluted and unhealthy environment. Moreover, most of the people are illiterate or having little education, which is another vital reason for not understanding the real essences of adopting WSS services in the community. The socio-economical status of the inhabitants also provides indication of having inadequate knowledge on health and hygiene practices as they are struggling all the time to engage themselves with money generating activities for the fulfillment of basic needs like securing shelter, arrangement of regular meals etc. The slum dwellers have no alternative to think about the improvement of their lifestyles rather than struggling for fulfilling the fundamental requirements. Therefore, the external support agencies have to take initiative to make them understand the significance of adopting WSS innovative processes and hygiene practices that would improve the standard of livings of the slum dwellers by ensuring maximum utilization of their limited resources.

Thus, the external agencies introduce various awareness creation and enhancement activities for the capacity building of the inhabitants. Under the capacity building activities, the external agencies arrange various types of training and orientations on organizational development and institutional arrangements, functioning mechanism of CBOs, enhancement of knowledge on hygiene practices etc.

The capacity building activities have ensured strong impacts on successful implementation of WSS innovative processes in urban poor areas. Gradually, people have got the opportunity to learn in detail and practicing hygiene practices and adopting WSS facilities into their daily lives. Therefore, the issue capacity building of the people has been considered as an essential component to ensure easy access of water supply and sanitation facilities in the urban poor areas.

### **3.3.1 Awareness building on WSS**

While developing innovative concept of serving the people through ensuring WSS facilities inside the poor urban areas, the project implementing agency emphasizes on the significance of initiating various activities to create awareness among the target beneficiaries on usefulness of having WSS facilities in the communities. From the field level experiences, the project implementing agency/NGOs have successfully identified that people living in the urban poor areas were completely unaware and unconscious about the impacts and consequences of adopting safe and systematic WSS practices into their daily lives (VERC). Therefore, the project implementing NGOs have introduced various types of mass awareness building campaigns and activities in the urban poor areas.

Usually the project implementing agencies are applying various PRA tools to encourage the community on WSS related issues. In this regards, the implementing agencies have to take proactive role for igniting the people living in those areas. Such initiatives have provided positive impacts upon the inhabitants for awareness building on WSS related issues and activities. Most useful PRA tools that are applied among the people are as follows:

#### **3.3.1.1 Rapport building**

In general, the project implementing agencies firstly emphasis the issue of creating awareness on WSS issues among the people living in a particular area. At the initial stage, the implementing agencies have applied various initiatives to make the people understand the importance of having water and sanitation facilities in the community.

After the inception of the project, generally the implementing agencies visit the project areas for developing informal relationships with the community to make them understand and creating awareness on WSS issues. The implementing agency works extensively in a particular area for recognizing the social/community leaders, discuss about various aspects of WSS issues, share their views and relate all discussions with the existing environmental conditions of the area. Religious leaders, public representatives, local level politicians, school teachers, social workers and other interested persons are basically considered as social leaders that have some kind of influence among the people in the community. Such initiative has been taken as the first step of implementing WSS innovative process in a community. While the social leaders are understood the significance of adopting WSS services in the community then those leaders work directly with the implementing agency for creating and building awareness on WSS issues among the general people living in those areas. Such initiative has found effective for awareness building on WSS related issues and activities among the people. It took nearly three months to create awareness and establish respectable relations with the community (B-01).

### **3.3.1.2 Health-walk/transact walk: DSK/VERC**

One of the most effective ways to create awareness among the people of the community is to arrange transect walk. Mainly the implementing agency takes the initiative to gather elites of the community with other inhabitants to learn from practical experience about existing environmental situation of the surrounding areas and its negative impacts on health. The main objective of organizing the transect walk is to provide the opportunity among the inhabitants to understand the effects and consequences of the unhygienic environment, which helps to create awareness among the people. Through the transect walk people visit sites of open defecation and garbage dumping. It is considered as an effective even where people of the community have got the opportunity to visit sites of open defecation and learn the negative consequences of not having environmental friendly atmosphere in the community. The people of the community feel embarrassed by the situation and the accumulated filth; it triggers a discussion about how they feel and their desire for change. The visit helps the community to realize the action for change can come from within the community, not outside (B-09).

People those took part on the transect walk then take initiative to arrange community meeting with both men and women so that the awareness of the situation and desire for change can be shared with others in the community. The implementing agency assist them to understand the pros and cons of not having hygienic situation in the community and ignite them on taking required actions to ensure healthy environment in the community. Other key purposes of the meeting are to triangulate the information given and to get maximum participation in identification and assessment of the situation and feasible solutions for improvement.

### **3.3.1.3 Social Mapping: VERC Document**

Development of social mapping is another effective way to create awareness on WSS issues in the community. People are asked for introduce the community by reflecting it in a map, featuring the roads and lanes within the community, common places, all households, water points and latrines etc. The map is drawn on a large sheet using various color marker pens. Sometimes, people draw the map on the ground by using various color-dusts for clearly define different elements of the community. On the map, people also draw water points and latrines indicating various different types. Any environmental hazards are also indicated like pointing out open defecation places. Once the map is complete and accepted by the community, the overall situation becomes visible and people usually start passing comments and accepts that the situation in the community is really awful, unhealthy and unacceptable. These type of practical demonstration create awareness among the people in the community.

#### **3.3.1.4 Development of community action plan (CAP):**

The slum dwellers designed Community Action Plan (CAP) with direct support from the implementing NGO while they called for a projection meeting in the slum and all slum dwellers were participated actively on the event, especially women. The community identified and prioritized various problems and developed a road map to improve the existing situation through using their limited resources and availing technical and financial assistance from external sources. The key issues of the CAP were: improvement of the entry road, safe water, hygienic latrine and promotion of hygiene practice.

#### **3.3.2 Community based capacity building tools**

The implementing agency arranges different types of training sessions at various stages for the capacity building of the community. In general, the implementing agency organizes leadership training, management training, financial training, hardware and O&M training and hygiene promotion and practices training etc.

Usually the members of different community based committees have received different types of trainings for the enhancement of the capacity to ensure proper functioning of CBOs and long-term sustainability of WSS innovative process. These are basically short term training programs that are well known as orientation programs. Duration of arranging different types of orientation programs varies from one organization to other. Generally, these types of orientation programs are conducted for 1-3 days (B-03; Ta Block, Mirpur; ARBAN). The implementing agencies have developed separate training modules for each type of orientation program and used those in the field for enhancing the capacity of the members of different community based organizations. The project implementing agencies appoint staff for conducting various orientation and trainings among the inhabitants.

One of the major interventions of WSS innovative processes is to address the hygiene promotion component as an integral part of the project. This is one of the unique interventions of the WSS innovative process. Such hygiene promotion training sessions provide positive impacts on overall improvement of the environmental situation. The implementing agencies organize hygiene promotion training sessions to cover all sections of the people in the slum area. Therefore, the implementing agencies take initiative to organize the people for taking hygiene promotion training at the community level. The implementing agencies have developed training guidelines through incorporating relevant hygiene issues on hygiene promotion component and arrange short-term training programs in each community (B-1 to 5 and B-8 to 10). Major hygiene promotion issues are as follows:

- i. Using safe water
- ii. Using sanitary latrine
- iii. Washing hands
- iv. O&M of sanitary latrine and water source
- v. Arsenic contamination
- vi. Personal hygiene
- vii. Family hygiene
- viii. Community hygiene
- ix. Menstrual hygiene

Usually, the duration of conducting training program on hygiene promotion issues is for three months though have some exceptions (B-05; Old Zimkhana, Narayangonj). Mainly females of the community are allowed to

attend the hygiene promotion training programs. Females are divided into three groups and take lessons separately from the implementing agencies. These are: adult, adolescent and children groups.

**Children group:** A children group is consisted of ten children that are considered as children leaders. The group actively attends the training sessions to learn on hygiene issues. The implementing NGO/agencies follow different type of process to make the sessions interesting to the children. The implementing NGOs/agencies convey hygiene related messages through various games, songs, rhymes etc. Each child is responsible to disseminate those messages among his/her friends. In general, each child covers 5-10 of his/her friends to make them aware on hygiene promotion issues. The children meet regularly to discuss health and hygiene issues and make plans for further actions like disseminating hygiene messages among their friends, family and neighbors. They initiate different activities including cleaning exercises, processions etc. there is no fixing number to form a children group.

**Adolescent group:** All the adolescent girls of the community are encouraged to participate in the sessions due to the importance of following adequate hygiene practices during the pubertal period; each group consists of ten members (B-05; Old Zimkhana, Narayanganj). Adolescent girls are also responsible to disseminate those lessons among their friends. The implementing NGOs/agencies develop separate training module and arranges regular courtyard sessions within the community. Adolescent girls follow those lessons learned and monitor each other to ensure cleanliness in their daily lives.

**Adult or women group:** Main objective of forming adult or women group is to promote behavioral change and monitoring. In general, each group is consisted of 10 members; however there are some exceptions. For instance, in Old Zimkhana of Narayanganj, each group consists of 12-18 female members selected from every five adjacent households (B-05). Members of the women group attend courtyard sessions regularly and take lessons on hygiene practices issues. Members are also consciously emphasizes on practicing hygiene lessons into their daily lives. Women group is also responsible for sharing hygiene related messages to their family, friends and neighbors.

As the implementing agencies are considering the hygiene promotion issues as vital for ensuring sustainability of the process, they arrange such training programs into small groups within the community. Different sessions are arranged for different groups to disseminate hygiene related messages among the participants. In general, there are 10 members in each group. The members of each group further disseminate hygiene related messages within the family members, adjacent houses, friends and relatives etc.

The implementing NGOs play the active role to motivate the people in the community and assist them to form different groups to learn on hygiene promotion issues. The community mobilizers are the responsible persons to organize the community for attending the hygiene sessions on a regular basis (B-01 to 05, B-08 to 10). The implementing agencies organize courtyard meetings to disseminate hygiene promotion messages among different groups.

### **3.3.3 Factors influencing in awareness building**

Usually, people of the community are not well aware about water supply, sanitation and hygiene issues. In most cases, people are completely unaware about the consequences of not introducing a systematic mechanism to receive safe water and use hygiene latrine and practicing hygiene issues into their daily lives. They do not have adequate knowledge on environmental hazards relating to water supply and sanitation and relation with health problems. Therefore, the implementing agencies have to take initiative to make them understand the significance of enhancing the knowledge level of the people to follow a systematic water supply, sanitation and hygiene promotion practices within the community. Basically, all the inhabitants are busy with pre-

occupied household related activities and are not interested to share more time on community based WSS activities. Therefore, it depends on how the implementing agencies influence the people to convey essential messages and how people response on it. Therefore, awareness building campaign is considered as one of the major challenges for implementing innovative WSS process in the community. The community cannot accept the innovative WSS process unless they are influenced by the implementing agency for creating and raising awareness on WSS issues. The implementing agencies have to work hard to convince and encourage the people and organize them to attend hygiene sessions. Usually the mindset of the women start changing after attending training sessions arrange in the community (B-04; Ghuntigar, Jurain).

Practical demonstration has direct implications to ignite the people on adopting water supply and sanitation and hygiene practices into their daily lives. Unless successfully used the PRA tools among the people living in the community, people wouldn't feel encourage to accept and adopt newly invented WSS process. Therefore, the use of PRA tools has direct impact to ignite the people adopting new concept for the betterment of their lifestyles. The implementing agencies have learned the lesson from their practical field experiences and therefore, applying various types of PRA tools to guide the inhabitants into right directions through ensuring easy access to safe water supply, using sanitary latrine and adopting hygiene practices. Most commonly used PRA tools are transect walk, social gathering, arranging projection meeting, social mapping, development of community led action plan, community based system implementation, monitoring, operation and maintenance etc. These types of PRA tools have direct impacts on the people to accept WSS innovative process in the community (B-01 to B-05 and B-08 to 10).

Introduction of different capacity building activities provide positive impacts in awareness building of the inhabitants. The implementing agencies arrange various orientation programs and training sessions for enhancement of the knowledge level of the people on WSS issues. Such type of initiatives considered as an important factor to influence the people adopting WSS innovative process in the community.

Though the community received short term training on hygiene issues, which create some awareness on hygiene promotion issues, however it is not enough to change the behavior of the people in a steady manner. The issue of behavior change is considered as a hard task and couple of months training is not adequate to change the previous behavior. Long term training on hygiene promotion activities can successfully be influenced the people in changing conventional behavior practices through adopting hygiene practices into their daily lives (B-01 to 5 and B-08 & 10). Therefore, continuous training on hygiene promotion is required to provide steady impacts on behavioral change.

Introduction of community led monitoring procedure has direct influence to the people in implementing WSS innovative process in the community. The implementing agencies encourage the women in the community and assist them for the development of community based monitoring process to monitor the overall progress of hygiene promotion issues among the inhabitants. Usually, women in the community jointly develop the monitoring process and maintain monitoring chart to keep records of the status and progress of each household. The chart is upgrading in each month. Introduction of such system provide positive impacts among the people adopting hygiene practices into their daily life and it is considered as an important factor to influence the community for accepting WSS innovative process at the community level. In the process, women play active role in the decision making process. Such type of practice directly influences women to accept hygiene practices into their daily lives and to encourage others for following the same.

## 3.4 Factors Impeding Institutional Development Process

### 3.4.1 Local political manipulation

Local political affairs have extreme influence towards the society. The local government division is responsible to provide utility and other services among the citizens. The City Corporations and Municipalities work under the local government body and serve the people accordingly. In Bangladesh, the lowest government tier is known as “ward”. There is a ward commissioner who has government authorization to serve the people according to the government law. The person is a public representative and elected by direct public votes. It is a political position and the political parties nominate their candidates for the position. It is the reflection of actively functioning of different political parties at the ward level.

In an ideal situation, the political leaders should be the visionary persons having a specific philosophy and they would guide the nation to achieve steady progress on the improvement of the socio-economical situation of a country. Usually political leaders take various initiatives to convince the general people on their philosophical belongings and encourage them to become valuable members of their political parties. In reality, the situation is completely different than what should be in a perfect case. The political leaders in this region are always manipulating the general people within their territory. The political leaders always create pressure among the general people to work in their favor. Though there are different types of political parties functioning in one place however, actual motive of all the leaders are not to serve the general people for improving the overall socio-economic conditions of the inhabitants rather benefiting themselves by using the general people that are living under the constitutional area.

At the lowest government tier, the political leaders are involved with bad politics. They believe in power politics. The political leaders are highly against in establishing social bondage among the people living in slum place. They believe in “divide and rule” concept and create chaotic situation in the society. The political leaders have strong influence among the people living in slum areas (B-01 and N-08). People living in slums have serious economical constrains and lack of social entitlement as they live in unauthorized areas. Therefore, slum dwellers have to depend on the politicians as they are the public representatives and conceptually work in favor of the general people. The politicians consciously create chaotic situation inside the slums. The politicians generate different groups and engage one group against others for create and keep unstable situation in the areas. Such practices are highly discouraging for taking initiative in formation of community based organizations (CBOs). People feel encourage to receive WSS services through adopting institutional procedure where political manipulations by the politicians is at the minimum level.

In reality, the political leaders have direct influence among the slum dwellers. They are not interested to provide adequate utility services in the slum areas rather manipulate them for their own benefits. Most of the political leaders have their own musclemen, which are known as mastaans. They use the musclemen to create unstable situation in the area. The politicians consciously create conflicts among the people living in the area by using the mastaans. In some places, the political leaders are directly involved with drug business and continue the business inside the slum areas where slum dwellers become helpless to protest against them for not having unity among them. Mastaans control the overall situation in the areas. Slum dwellers are used as the weapons of the politicians.

Therefore, it is seen from some of the case studies that, acceptance of any new concepts are not always welcome by the community for having bitter experiences from outside power structure. On the other hand, the people of the community are sometime scared to received support from outside sources due to invisible pressure from the political leaders. Water supply and sanitation are the basic needs and the poor people are

very much willing to receive such basic services within their areas. However, the acceptance of such type of essential services is fully depending on considering the level of hazard came from the political leaders. The political leaders are highly in against of allowing the people of the community for developing unity and cooperative attitude among them.

People of the community maintain regular communication with the ward commissioner at ward level to receive basic services and cooperation from the government body. As they are illegally living in an unauthorized area, usually they are in obligation to receive their instructions. The ward commissioner takes the advantage and tries to establish an influential situation among the general people. Such situation provides negative impacts among the people for receiving utility services including water supply and sanitation facilities from the external sources. Therefore, political attitudes of the politicians are one of the major influencing factors that discourage the people to organize themselves for receiving WSS services.

The political leaders create pressure among the slum dwellers for not receiving any utility services from outside sources. In general, the attitude of the government party and the opposition are same in the case of manipulating poor people in the society. Therefore, political manipulation is one of the major factors that have direct influence among the people living in the slum areas for acceptance and rejection of the newly invented WSS process.

#### **3.4.2 Interference of invisible power**

Poor people that are migrated to different cities having no references in the urban areas usually take shelter in public or government lands. These are basically illegal settlements however has interference of invisible power structure. There are some influential leaders in the area have liaison with political parties, hoodlums and other influential persons.

Mostly, influential leaders of a particular area having close connection with political parties or hoodlums generally have their own control over such pieces of land. There are three types of house ownership in urban poor areas known as “slum”. Some of the influential persons might rent some lands to others; some settlers might construct housing live in one room and rent out other rooms and some others who live in one room shabby structures. (Bagan bari, DSK)

Usual practice is slum hoodlums, musclemen or popularly known as “mastaans” controls this type of settlements and regularly collect rents from all types of settlers. This way, they receive a huge amount of money on a monthly basis from the slum dwellers. It encourages mastaans on continuous manipulation among the slum dweller as these earnings are guaranteed without investing anything in the area however getting money from the illegal settlements. Therefore, mastaans are always kept the inhabitants in pressure and closely monitor activities of the slum dwellers and take quick actions against any occurrences that might go against their interest. They have good connection with local law enforcing agencies and such government agency representative also does receive payment from the mastaans.

Any new entrants to slums are marked by “mastaans” and they generally challenge such entrants. Usually mastaans do not create any obstructions for the new comers that are intended to live in the slum as it would count additional money for them and also provides the opportunity to use them in future, if required.

Usual practice in urban poor areas is that, different government and non government organizations work in the illegal settlements to provide various services among the people for the improvement of their life styles

including health services, hygiene practices, easy access to water supply and sanitation facilities etc. When these types of organizations enter into any such places it obviously marked by the “mastaans. They generally challenge the entrants to explain their motive and allow them to work if they realize that their leaderships wouldn't be threatened by the external agencies.

In general, the implementing NGOs face such types of challenges while get enter into any urban poor areas for implementing WSS innovative process for ensuring easy access to WSS services. The implementing NGOs provide their efforts to convince mastaans that their main objective is not to challenge their leadership but to extend water supply and sanitation network into the slum, which would improve overall environmental situation of the area. However there are several instances at the initial stage when slum “mastaans” were suspicious and tried to obstruct preparatory work to extend water supply and sanitation network in urban poor areas. Initially, many NGOs were obstructed for implementing WSS innovative process in some of the urban poor areas. However, over the time, NGOs learnt many fine details to manage mastaans and eventually, NGOs become more engaged with city corporations and municipalities. Therefore, access to the urban poor areas become easier for NGOs and other organizations for implementation of WSS innovative process in those areas. CBOs are also created pressure from the inside for resolving the problems; such CBOs initiative is minimized the influence of mastaans to a great extent. (DSK, Banganbari)

Local mastaans are not essentially the inhabitants of the slum area. Usually godfathers control the area from outside. Local influential leaders work inside the slum and follow instructions from outside sources. Therefore, local mastaans that are living inside the slum have severe influence over the general people living in the area. Outside mastaans have also influence as they are living in surrounding areas. Local mastaans have a direct linkage with politicians, local leaders, some of the government organizations and local law enforcing agencies. All of them are the part of the invisible power structure that are manipulating the low-medium income group people and illegally benefiting themselves.

Therefore, the slum dwellers are not willing to organize themselves and take initiative in formation of community based committees for receiving WSS services from the outside sources. In this regards, the external NGOs have to play the active role for encouraging the community to organize themselves and form CBOs for taking WSS services from outside sources.

**Major factors discouraging the people for the development of community based committees:**

- Invisible power structure applies the “Divide and Rule” method among the general people, which discourage people for adopt institutional development process inside the slum areas...
- Invisible power structure consciously creates divisions among the slum dwellers, which is the result of forming different groups in the community that works against each other. Such type of situation works as one of the major factors to influence people following institutional development process in the community.
- Invisible power structure continuously keeps pressures among the communities for only following instructions given by them, which demoralizes and discourage the inhabitants to take initiative for establishing understandable common platform among them. Therefore, people take times for close observation of the situation and to adopt institutional development process among them.
- Generally, invisible power structure do illegal businesses forcefully inside the slum areas including sale various types of drugs, trade weapons, make deal for different types of outlaws' activities etc. Such situation cannot be desirable by the inhabitants and they always look for an opportunity to leave the place. Therefore, the issue of developing institutional establishment inside the slum areas become threaten and people usually do not feel encourage to adopt institutional setup for ensuring easy access of WSS facilities in the area.

- People living in the slum areas are psychologically not strong enough to face any kind of problems that comes from inside or outside their territory as living in unauthorized places and financially also weak as they represent themselves as low and middle class people. Therefore, the slum dwellers usually play passive role to organize themselves and take initiative to form CBOs for availing WSS facilities in the areas.

### **3.4.3 Socio-economic conflicts**

In urban poor areas, there are different types of people living in one place that came from different parts of the country. There are cultural, religious and socio-economic differences among the people. Most of the people are migrated from rural areas for the improvement of their socio-economical status. Though all the inhabitants have common objective to improve their social status and financial conditions, however, it depends on individual capability and excellence. In the urban poor areas, especially slums, socio-economic conflicts are very common among the slum dwellers. It was a severe problem in early 90's when NGOs have just started piloting and implementing various WSS concepts in the slum areas where community played the key role for the overall management of such initiatives.

#### **3.4.3.1 Economical Factor**

The socio-economic conflicts provide negative impacts among the inhabitants and it creates meaningless distance among them. The economical conditions of the slum dwellers are considered as low and middle class people though the incomes range of some of the people are higher compare with others. There are also hardcore poor livings in the same areas. Therefore, it has given a clear indication that the economical status of the inhabitants has huge disparity. The massive economical inconsistency sometimes creates conflicts among the people in the community. In general, it is seen that comparatively financially better off people are always very much eager to hold power in the community. They always want to dominate others; they are very keen to maintain liaison with invisible power structures and try to play control role in the decision making process. As most of the people living in the slum areas are struggling individually for changing and make better off their lifestyles, they are usually against in such type of attitudes, which creates conflicts among the inhabitants and ultimately provides negative impacts on overall development of the community and to ensure easy access of WSS facilities in the slum areas.

Same way, middle class people take advantage against the low income group and hardcore people. From the other side, financially deprived people are not at all interested to follow the instructions given by them as they are conscious about their own social status. Therefore, financial disparity is one of the factors that sometimes discourage people for establishing cordial relations among themselves through following institutional development process. Majority people are representing low and middle income group people and they are interested to develop and establish cordial atmosphere among themselves that would help them for taking various decision

#### **3.4.3.2 Religion Factor**

Religion aspect is another vital issue that create conflicting situation in urban poor areas. People of different religions are living in the same place including Muslim, Hindus, Buddha etc., having different groups under one religion and cast problem. Different religious people follow different processes and have different costumes that separate the inhabitants from one and another. Casts problem make distance among the believer of Hinduism not only with the high casts in their religion but also with other believer's of other religions. Sometimes the life styles of different religious believers are also different, which is considered as one of the major barriers to make closer the distance among the people. In the slum area, people wouldn't be able to develop cordial relationship and unity among themselves unless keep separate the religion issues at individual

level and promote common and basic issues like easy access of WSS facilities in the community. Unless developing cooperative atmosphere inside the slum areas people wouldn't be able to receive utility services in legal ways including WSS facilities from outside sources. Therefore, religion is one of the factors that influence on developing cordial relationships among the inhabitants and development of institutional process to form CBOs.

#### **3.4.3.3 Cultural Factor**

Cultural aspect is another important issue that can be considered as a major factor for establishing warm and supportive environment in urban poor areas. As the slums are the temporary settlements, people from different parts of the country come into those areas with a dream of changing their fortune through make better off their livelihoods. There are different cultures in different areas. The culture of the northern part of the country would be totally different from the southern part. The culture of the people living in hilly areas would be different than that of living in river side areas. Actually cultural aspects are determined by various issues that has direct linkage with nature i.e., geological and ecological aspects, surrounding natural environments, availability of natural resources etc. Therefore, the life style of the people living in the hilly areas or the natural catastrophic regions are extremely hard compare with others like those are living in flat lands and having no natural challenges. Therefore, in the slum area, it is easily understood that there are diversifying cultural people living in one place, which can be considered as a problem for ensuring harmonies among the people came from different cultural background.

Unless establishing cordial and understandable relationships among the inhabitants in the areas, people cannot expect receiving basic services including WSS facilities from legal sources. The inhabitants can strongly communicate with the relevant government organizations for receiving legal utility services if they organized themselves and develop organizational setting, which is known as CBO within the community. Formation of CBO would establish institutional development in the area. Sometime, cultural issues create uncomfortable situation among the people and restrict others to organize themselves and in formation of CBOs. Successful adaptation of WSS innovative process depends on minimizing cultural distance among them. Therefore, cultural aspect is one of the factors that have influence in institutional development process in the area.

External support agencies have been working and implementing various types of WSS innovative processes in urban poor areas for more than two decades. It was evident from field experiences that socio-economical conflicts provided negative impacts on proper implementation of WSS innovative processes. The implementing NGOs used various PRA tools to encourage the people of the community and made them aware about positive consequences of receiving legal WSS services in the community. People of the community gradually began to understand the message disseminated from the implementing NGOs and organized themselves for receiving WSS services in legal ways in the community. Community took self initiative to resolve different types of problems that they treated as serious barriers for ensuring overall development of the existing environment inside the slum area. That way, community took active initiative to minimize the socio-economical conflicts among themselves. Nowadays, community has successfully restricted such type of conflicts in the community.

#### **3.4.3.4 Social Factor**

Inter as well as intra community conflicting interests are one of the major constraints for the implementation of the project at the initial stage. In Nepal, most of the aged people are highly against for the construction of modern system as they are much acquainted with traditional water system. According to the perception of the community, development of modern system is against the tradition and culture (N-05).

Some of the communities are not in favor of introducing modern system as they considered all users should consume water from a public resource equally and that the benefits of that water should not be confined to a particular group. Indeed, users are on the fear that building such system would decrease the quantity of water available to others.

The local youths play the vital role to convince the people with traditional belief and materialized the new innovative concept in the community. The youths have taken initiative to create awareness among the community people on WSS system that the system could solve the water scarcity problem and reduce the large time required for fetching water (N-05). Social conflict could be resolved through discussion and well understanding of the benefits of the intervention.

#### **3.4.3.5 Conflict of interest among stakeholders**

Many NGOs, government organizations, development partners are directly and indirectly working in urban poor areas. Though there are many stakeholders involved with implementing various WSS projects in urban poor areas, the project implementing agencies have to play the key role for successful implementation of the project objectives. In general, the government organizations and NGOs are mainly responsible for implementing of WSS initiatives at the field level. Therefore, the possibility of occurring conflicts inside any slum area depends on the level of mutual understanding among different implementing NGOs.

Different organizations have different perceptions to serve the people living in the slum areas. At the same time, all the NGOs have its own working processes to implement any particular concepts/approaches in the fields. Different NGOs use different types of PRA tools to encourage the people and adopt WSS services in the community. Management mechanism of implementing a project in the community is also differs from one NGO to others. Usually each NGO provides its efforts to work in a unique place where no other NGOs are working with the same type of concepts. When more than one implementing NGOs provide their efforts for implementing same type of WSS related activities in one place, the successful completion and sustainability aspects of the WSS initiative would be in high risk (B-07). The target beneficiaries also become confused when they start receiving instructions from more than one organization.

It is also same in the case of implementing any WSS related initiatives by more than one government organizations. Internal conflicts within different government organizations provide direct negative impacts towards successful implementation of the project objectives and the target beneficiaries. Actually, all the government organizations have their own regulations and processes to implement various types of activities. Usually, all the government organizations have individual authorization to work independently through maintaining liaison among them for ensuring effective implementation of a WSS initiative. Therefore, one government organization would never been shown their interest to work under another government organization. Conflicting situation would arise among different government organizations if such a situation arises; it also provides negative impacts among the ultimate beneficiaries (B-07). In this case, people wouldn't feel interest to organized themselves and cooperation the external organizations for receiving WSS services in legal ways.

Therefore, conflict of interest among different stakeholders can be considered as an important factor for implementing WSS innovative process in the urban poor area.

### **3.5 Multi-stakeholders' Partnerships**

Development of an innovative project is a multifaceted task. Many stakeholders have to provide joint efforts for the development of a project concept. Different factors have to be considered while a combined effort has been given for designing of a consequential conception. Same way, many stakeholders have to provide joint efforts for implementing a comprehensive concept at the field stage. There are institutional and organizational aspects where it has to explain the administrative arrangement of the project, involvement pattern of various stakeholders including government organizations at various stages, involvement of development partners, community participations and establishment of various types of community based organizations and their linkages with others; financial aspects like arrangement of required fund, development of an acceptable mechanism of multi-stakeholders sharing a part of the face value of the project, cost-sharing mechanism of the target people and also sustainable aspects that would ensure long term existence of the innovative approach and community should take over the responsibility of the project and benefiting themselves in sustainable way. In water supply and sanitation sector, different stakeholders also follow the same process starting from the conceptual aspects till implementing the project at the field level.

Different stakeholders are the government organizations, development partners, INGOs/NGOs, CBOs and ultimate beneficiaries etc.

#### **3.5.1 Involvement of Development Partners**

Water supply and sanitation are some of the basic needs. It is the responsibility of the government to take necessary schemes for ensuring easy access of WSS services among the citizens. The government couldn't arrange adequate WSS services for the citizens due to many reasons. The government could have resource limitations, financial constrains and technical shortfalls to arrange required WSS services for all. As there are diversified issues relating to WSS activities, the government also encourages other stakeholders to provide joint efforts to serve the general people receiving WSS facilities at the community level. Development partners are one of the major stakeholders in the sector that provide different types of expertise support in the sector and jointly work with other stakeholders.

##### **3.5.1.1 Partnership with Bi-lateral organizations**

In Bangladesh and Nepal, the central government has taken various WSS innovative processes to provide water supply and sanitation facilities in the urban poor areas. In this regards, the government takes necessary cooperation from the developed countries. Under the bi-lateral contact, the developed country provides technical and financial support to the developing countries. The developed countries also provide technological support for the enhancement of overall quality services for the people. They also share advance knowledge relevant with WSS activities with stakeholders. In most of the cases, the developed countries allow grants for implementing various concepts/approaches and innovative project/program in the developing countries. For instance, British Government provided financial cooperation on a government project in Nepal, namely "Damak Water Supply and Sanitation Project", which is implementing in Tarai part of the Eastern Development Region of Nepal (N-02). There are many such countries arranging grants for implementing different types of WSS projects both in Bangladesh and Nepal. Some of the Bi-lateral organizations are DFID (B-02), GTZ (N-03) etc.

##### **3.5.1.2 Partnership with Multi-lateral organizations**

Some of the international organizations provide multi-lateral support to the developing countries. The World Bank and Asian Development Bank are mostly common of such type of international organizations in this region and serving different nations under multi-lateral contacts with the central government of particular

countries (B-08 and N-07). These types of international organizations allow both grants and loans for implementing various innovative projects and programs at the field level including water supply and sanitation. They also provide specialized services in the sector for the improvement of standard of living of human beings and to serve the people in the fulfillment of the basic needs. Under the multi-lateral contract, the international organizations also take necessary initiatives for technology transfer in the developing countries. They also promote user-friendly and appropriate technologies for the community to ensure WSS services for all. The multi-lateral organizations have the feasibility to be involved with multi-stakeholders' project where many organizations providing various types of cooperation and specialized support on a particular project. In that case, they share a portion of the project cost in the large project like "DISHARI in Bangladesh to ensure access of WSS services among the poor inhabitants (B-08).

#### **3.5.1.3 UN System**

UN system has immense influence in the development sector activities. UNDP, Unicef and other UN organizations have substantial involvement in WSS sector both in Bangladesh and Nepal. UN organizations maintain close communication with the central government and assist the government in different ways. These organizations are considered as extremely resourceful institutions. They also provide various types of technical cooperation for proper implementation of WSS activities. UN organizations provide their efforts for the development of innovative and effective WSS projects and also keep involved strongly with the implementation phases. In most of the cases, UN organizations are considered as one of the largest funding agencies in the region. In general, financial aid has been transferred as grants. UN organizations provide financial assistance to the central government. However, they also serve national level NGOs for implementing small level activities at the field level (B-07). According to the UN regulations, they encourage the central government for sharing a portion of the face value of the project to ensure ownership for implementation of various WSS projects/programs (GoB-UNDP; B-06 and Gob-Unicef; B-07 in Bangladesh). UN organizations actually encourage developing comparatively large projects or programs where those projects would consider various relevant components within one scheme like a package i.e. women empowerment, micro credit, keep provision of receiving safe water and sanitation facilities etc.

#### **3.5.1.4 International NGOs**

There are many International Non-Government Organizations (INGOs) that are providing technical and financial assistance to many WSS innovative projects to serve the poor people receiving WSS services at the community level. In the sub-continent several INGOs working actively to facilitate the national level stakeholders for implementing diverse WSS related activities at the field level. Main objective of serving the poor people is to provide basic services among the poor people both in urban and rural areas. In urban poor areas, INGOs are mainly worked with the national level NGOs to facilitate basic WSS services, which would directly and indirectly improve the primary standard of living of underprivileged people. INGOs are mainly committed to work directly with the national level NGOs. However, these organizations also provide assistance to the government organizations under any specific circumstances. In the water and sanitation sector in Bangladesh and Nepal, INGOs have significant involvement to serve the poor people that are living in urban poor areas (B-01 to 05 & B-08-10; N-06 and N-08 & N-09). Mainly INGOs provide financial assistance to the implementing agencies for implementing any pilot initiative or replicating successful WSS innovation into other areas. Mostly INGOs provide grants to the national level NGOs for implementing various WSS innovative projects at the field level. INGOs also provide technical assistance for the improvement of existing process that would establish a sustainable WSS process in urban poor areas. INGOs are also concern about installation of user friendly technologies. Sometimes, INGOs take initiative to transfer useful and low-cost technologies from outside sources and replace those in the project areas through implementing agencies. However, they always promote development of low-cost and user friendly WSS technologies by using local resources (B-09). Some of the INGOs provide specialize support to the project and take overall responsibility for the enhancement of a particular issue like encourage children of a community to play active role for

behavioral change through hygiene practices into daily lives (plan-Bangladesh). INGOs have the flexibility to work with multi-stakeholders' projects/programs (B-08).

### **3.5.2 Involvement of project implementing agencies:**

There are many stakeholders implementing various types of innovative processes to serve the urban poor for receiving legal water supply and sanitation facilities at the community level by taking technical and financial support from external agencies.

#### **3.5.2.1 Government organizations as the implementing agency**

In general, the government of a country takes initiative to implement large scale projects or programs at the nationwide or in selective places all over the country (GoB-UNDP). In that case, the relevant government organization has been assigned as the key implementing agency for ensuring successful implementation of the project (LGED/Nepal). By and large, the government organizations take the responsibility of implementing multi-stakeholders' project where many other stakeholders also have to provide active cooperation on various components of the project (Ban/Nep). The objective of such type of innovative project is to maximize the possibility of achieving the project goal and objectives and minimize risks of activating various activities in urban poor areas.

Sometimes, more than one government organizations have to share the responsibility of implementing one project. Therefore, one government organization has been assigned as the key implementing agency and other would be involved as the supporting organization. For instance, on a WSS innovative project in Bangladesh an autonomous government organization, "Department of Public Health and Engineering (DPHE)", has been assigned for implementing a GoB-Unicef project in different parts of the country; however, the city corporations and municipalities of different districts are implemented the project at the field level in mutual understanding with DPHE as they have direct mandate with the public to provide basic utility services among the citizens (Ban-Nep). The local government organization implement the project activities at the community level; the lower tier of the local government organization takes the responsibility to implement the project activities in different communities (in Bangladesh, it is known as Ward in the city corporation and municipalities areas). The local government organization maintains extensive cooperation with relevant stakeholders for ensuring proper implementation of project related activities. All government organizations are legally obligated to provide adequate information to the upper tiers and other relevant government bodies.

#### **3.5.2.2 Implementation of various WSS project by Non-Government Organizations (NGOs)**

In Bangladesh, NGOs are extensively working in the development sector for a quite longtime. In water supply and sanitation sector, NGOs are one of the major stakeholders that directly working at the field level to facilitate general people in receiving WSS services. Through implementing various types of innovative concepts, NGOs have been experiencing different types of innovative processes to arrange legal and safe water supply and sanitation facilities in urban poor areas. In Bangladesh, NGOs are the large stake in implementing various WSS activities in different parts of the country. In Nepal, there are also NGOs facilitating people to get adequate WSS services within the community.

NGOs are mainly committed to the society for the improvement of the life styles of the poor people through ensuring easy access on basic services. NGOs work extensively with the poor people living in slum areas. In urban poor areas, NGOs have taken different initiatives to serve the poor dwellers. In Bangladesh, according to the city corporation and municipalities' regulations, the government organizations are not allowed to

provide legal utility collections to any illegal settlements; same way, Water Supply and Sewerage Authority (WASA) has also legal obligation to provide officially authorized water supply connection into the unauthorized urban poor areas (B-01-10). As most of the slums are situated illegally in unauthorized places, the government organizations are obligated not to take any initiatives for the urban poor people living in those areas. Since NGOs have the flexibility working with different level stakeholders, they have taken the opportunity to work as the intermediate for resolving the legal barriers and ensure basic services for the urban poor. Therefore, different NGOs have developed various types of innovative approaches relating to water supply and sanitation to arrange legal WSS facilities into the unauthorized urban poor areas. Sometime, NGOs have taken joint efforts with other development partners for the development of WSS related innovative projects (WaterAid and NGOs). In this regards, NGOs have also taken proactive role to convince other stakeholders and ensure their involvement with WSS innovative processes. Presently, different development partners are providing various types of cooperation to the WSS innovative processes. Many development partners came out with possible cooperation for implementation of newly invented WSS processes. Different development partners provide different types of cooperation to the innovative projects; mainly these organizations have provided technical and financial cooperation for implementing innovative projects. A major portion of the development partners are providing financial Aid to the projects for implementing various approaches at the field level. Most important issues is that, NGOs are experiencing community led water supply and sanitation projects, where community play the active role to develop a sustainable process to receive WSS services in legal ways (B01-10).

NGOs have also taken various awareness creating activities for the government organizations to convince them and to provide possible cooperation to urban poor for receiving legal WSS services in those areas. Mainly, NGOs provide their efforts to influence the ward commissioner of at the ward level (lower tier) of the government body to provide possible support for implementing WSS activities in the urban poor areas, mostly slums. NGOs take long term advocacy schemes for influencing the government organizations. In Bangladesh, NGOs have successfully followed advocacy programs and influenced the government organization, namely, Water Supply and Sanitation Authority (WASA) to provide legal water connections into the slums areas though these are unauthorized settlements. In Dhaka, NGOs influenced the DWASA and signed on a Memorandum of Understanding (MoU) with them to provide legal water connection into the slum areas. It can be considered as a great achieve of brining the poor people under utility services (B01).

There are two types of NGOs functioning in Bangladesh. One type of NGOs is known as National level NGOs and other is local level NGOs. Generally, some of the National level NGOs is established local office setup for implementing the project at site (B-01-05). Some of NGOs have partner organizations at local level for implementing various projects in the field; these organizations are known as partner NGOs and directly work with the community in the projects areas (Prottashi). Partner NGOs are responsible to the National level NGOs and follow their instructions for implementing various project activities at field level. Local level NGOs are also maintaining regular communication with relevant government organizations and other stakeholders for implementing the project.

**Table 3-2: Role of different stakeholders**

Stakeholders	Main Activity
<b>Development Partners</b>	<ul style="list-style-type: none"> <li>• Expertise support on the development of innovative water supply and sanitation project</li> <li>• Designing the institutional and organizational arrangement of community led management procedure</li> <li>• Arrangement of Financial Aid: Grants &amp; Loans</li> <li>• Development of cost-sharing mechanism</li> <li>• Transformation of appropriate WSS technologies</li> <li>• Promotion of user-friendly WSS technologies</li> <li>• Continuous research and documentation</li> </ul>
<b>Implementing Agency:</b> Government organizations	<ul style="list-style-type: none"> <li>• Implementation of WSS innovative projects</li> <li>• Development of institutional mechanism to involve other relevant govt. organizations</li> <li>• Incorporation mechanism of other stakeholders</li> <li>• Organizational arrangement with CBOs</li> <li>• Continuous advocacy to the government organizations for legal recognition of CBOs</li> <li>• Development of cost-sharing mechanism</li> <li>• Installation of WSS hardware</li> <li>• Development of community based O&amp;M mechanism</li> </ul>
NGOs	<ul style="list-style-type: none"> <li>• Implementation of WSS innovative projects</li> <li>• Development of institutional mechanism to involve government and other stakeholders</li> <li>• Organizational arrangement of CBOs</li> <li>• Social recognition of CBOs</li> <li>• Bridging arrangement of CBOs with relevant government organizations</li> <li>• Disbursement of required fund</li> <li>• Development of cost-sharing mechanism</li> <li>• Technical assistance for installation of WSS hardware</li> <li>• Mobilize general people to create awareness on WSS innovative processes</li> <li>• Training on hygiene promotion issues</li> <li>• Development of community based O&amp;M mechanism</li> <li>• Development of community based monitoring system on hygiene practices</li> </ul>

### **3.5.3 Type of Agreement**

Different stakeholders provide joint efforts for implementing various WSS innovative processes in urban poor areas ensuring easy access of water supply and sanitation facilities in the poor communities. In general, development partners take the responsibility for arranging required funds for the implementation of a project where as a relevant agency takes the responsibility for implementing the project concept at the field level.

Sometimes, many stakeholders work jointly for implementing any large projects. In those cases, different organizations share the responsibility of the project based on their specialization on a particular issue, which helps the project to achieve the ultimately goal of the initiative. Therefore, all the stakeholders work as partners. Different organizations take different responsibilities for implementing a project like arranging required funds, provide specialized support on particular issues, take responsibility for implementing overall activities of the project etc. Specialized inputs are like provide support for documentation of conducting researches (B-08); provide specialized support to children groups for the promotion of hygiene behaviors (B-01 & 04); construction of hardware (B-07) etc. Before take initiative for inauguration of a project, the major organizations sign on an agreement or a contract for avoiding any unavoidable circumstances and ensuring mutual understanding among them. Usually, tripartite (N-03) and four-party agreement sign among involved organizations (B-08) for implementing WSS initiatives. In some cases, two parties also sign for implementing a project (B-10).

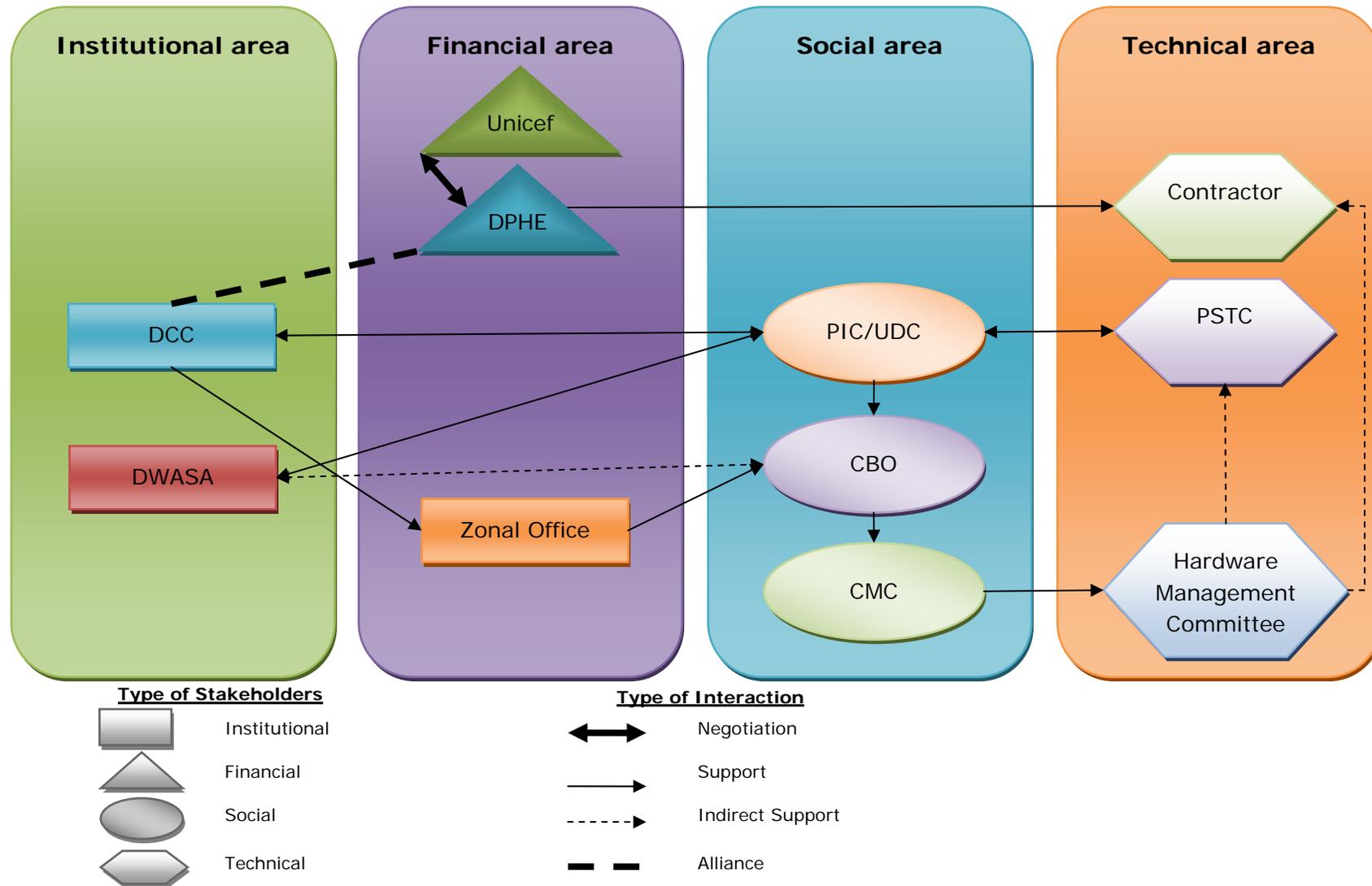


Figure 3-2: Stakeholders' Map and their interactions (Example B-07)

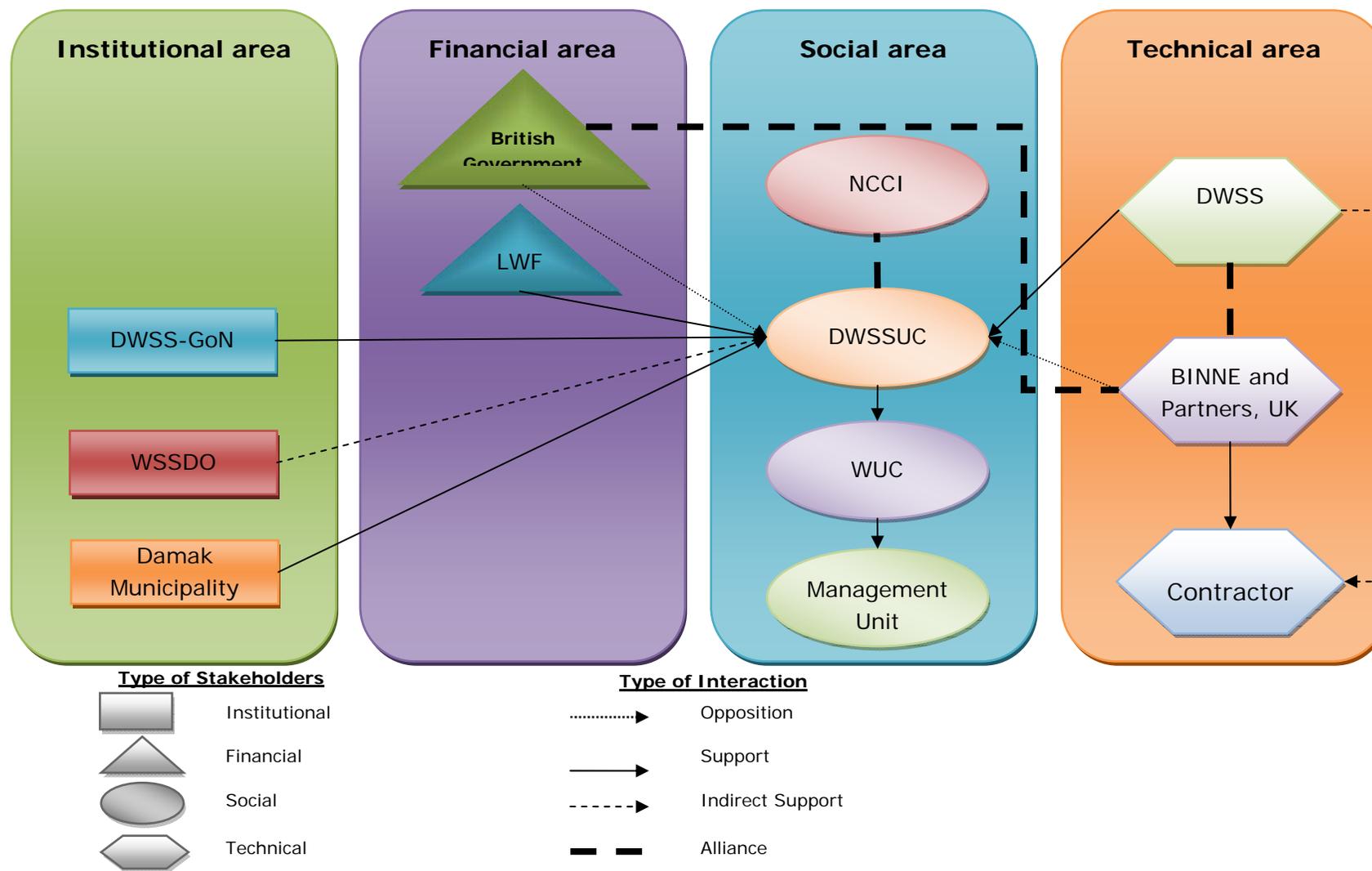


Figure 3-3: Stakeholder's map and their interactions (Example N-02)

# Chapter 4

## FINANCIAL MECHANISMS FOR THE DESIGN AND MANAGEMENT OF WATER SUPPLY AND SANITATION INTERVENTIONS

### 4.1 Introduction

There is large global deficit in the provision of water services. The proportion of people without access to water is around 15 percent in Latin America and Caribbean, 20 percent in Asia and 40 percent in Africa (Winpenny, 2003). Most countries of South Asia are likely to meet the MDG target on drinking water but not on sanitation. However, there are several challenges in water sector including lack of safe water, poor management of water utilities, low cost recovery, and perverse flow of public subsidy and/or resources from rural to urban areas and from poor to better off households. In the sanitation sector, the specific challenges are lack of awareness on its critical importance, low priority given to sanitation compared to drinking water, high cost for off-site sanitation, lack of space for onsite sanitation. Unless these issues are adequately addressed, investment in water supply and sanitation could not sustain water and sanitation services so as to maximize the well being of people.

The human development cost of water scarcity is immense. Some of such costs, as the Human Development Report 2006 points out, are as follows: (i) 1.8 million child deaths each year as a result of diarrhoea, (ii) loss of 443 million school days each year from water related illness, (iii) about half of the all people of developing

countries suffering at any given time from water and sanitation related diseases, (iv) millions of women spending several hours a day collecting water, and (v) those suffered from illness and lost educational opportunities will suffer from poverty in their adulthoods (UNDP, 2006A).

The report comes up with some recommendations, chief among them are: (i) make water a human right, (ii) draw up national strategies for water and sanitation, (iii) increase international aid – as only 5% of the ODA is spent in this sector, and (iv) prepare a global plan of action, such as the one for education – Education for All (UNDP, 2006A).

The Human Development Report 2006 stated that we need to act because if we continue with the business as usual approach, we will miss the MDG of halving those without access to water by 234 million people, and 430 million people will miss sanitation target. And if we take action and meet the targets, more than one million lives could be saved over the next decade with the economic benefits as high as US\$ 38 billion. However, water and sanitation sector suffer from chronic under-funding (UNDP, 2006A).

In spite of such a critical importance of water and sanitation for human lives, water service delivery is deficient in poor developing countries. Until recently it is mainly the public utilities in South Asia that have been responsible for provisioning drinking water, however, they have not been operating on economic and financial principles, and marred with poor management. One of the reasons for such an anomaly is the intervention from government and politicians in their management. The toll of such a weak management, as reflected in poor service delivery, has been higher on poor than better off households.

In order for improving the management, different institutional options have been advanced in the region so as to provide more autonomy to water utilities in their decision-making and management, and thus making them financially sustainable. Of all the options, the most viable option implemented in some towns of South Asia is delegating the management of water supply to private sector for some period of time.

Apart from efficient management, the water and sanitation sector needs adequate funding. The amount of resources required for water services is much larger than the capacity of resource mobilization in developing countries. The coverage of water supply and sanitation in South Asia was 87% and 36% respectively in 2000<sup>1</sup>. The governments are under stress to provide the services for the whole population because of the increase in incremental cost of water and sanitation on the one hand and lack of adequate resources on the other.

With the realisation that developing countries cannot by themselves fulfil the MDGs including that of drinking water and sanitation, developed countries have joined hands with them and formed a new global compact to support developing countries through aid, trade and technology transfer (UNDP, 2003). However, developed countries could not fulfil their such a promise of extending aid to the level of 0.7 percent of their GDP as their aid proportion is limited to just 0.25 percent.

Whether developed countries offer their generous support or not, the primary responsibility of meeting the MDGs including provision for drinking water and sanitation lies with developing countries themselves. Therefore, major financing mechanisms that are most relevant for them are internal resource mobilisation and community financing. This chapter focuses on domestic resource mobilisation, especially mobilisation of

---

<sup>1</sup> See Devarajan Santayanan, Margaret J. Miller and Eric V. Swanson (2002), *Goals for Development: History, Prospects and Costs*, April 2002.

resources from communities and/or users themselves through appropriate tariff structure and local financing mechanisms.<sup>2</sup>

Water is essential for human life; therefore increasing tariff has to be looked into from the perspective of both the social justice and human right. Despite this fact water is an economic good and therefore its efficient pricing is necessary in order to promote its efficient utilization. Therefore both efficiency and equity considerations are to be taken into account while devising tariff structure.

## 4.2 Financing the MDGs on Drinking Water and Sanitation: Resource Requirements at Global and Regional Levels

The Camdessus Report stressed the importance of attaining internationally agreed water targets and indicated that all sources of finance should be tapped, calculating that achieving the MDGs would require a doubling of existing finance.<sup>3</sup> It added that a pre-requisite for achieving these targets would be an improvement of the sector governance, better-cost recovery and some national public funding. The choice between public, private or Public-Private-Partnerships (PPPs) to finance the water sector was left to the individual countries.

Estimates for the total amount of funding required per year to achieve MDG Target 10, to halve by 2015 the proportion of people without sustainable access to safe drinking water and sanitation, range between US\$6.5 billion and \$75 billion per annum. Assuming incremental cost of new water services would be similar to current water services, Global Water Partnership estimated that it would cost additional USD 30 billion a year over the next 25 years to reach the target of universal coverage of water. However, at very basic level of coverage of water and sanitation, the cost is low as estimated by the Water and Sanitation Collaborative Councils, which is USD 9 billion per year (UN Millennium Project, 2005B, WELL Briefing note 9; and Winpenny, 2003).

Many finance mechanisms are available to meet this financing gap; unfortunately, most efforts are being targeted towards developing and promoting external resources that are more suitable to middle income countries. In response, a report by the MDG Task Force on water supply and sanitation noted that targeted grants should be provided for use in the poorest countries to bridge the finance gap (UN Millennium Project, 2005B).

While the Camdessus Report put the issues relating to finance in perspective, it did not go into detail on the types of financial instruments that could be used by different actors nor did it address the fundamental question such as how can a poor country access the necessary capital for water and sanitation investments? (See Winpenny, 2003 for the summary Camdessus report).

The global level estimates of the cost for meeting the MDGs vary widely. Realizing this fact, the global costing studies such as those of Zedillo and World Bank performed by Devarajan et al (2002), opted for

---

<sup>2</sup> One of the direct sources of resource mobilisation is water tariff itself. Therefore, appropriate pricing policy can be taken as measures in reducing constraints set from resource gap by assisting in development of better investment strategies. Besides, it can have important effect on efficient use of water resources on urban land use, and more broadly on allocation of economic resources of a country or a region (Bahl and Linn: 1992).

<sup>3</sup> Launched at the Third World Water Forum in Japan, the 2003 Camdessus Report 1 codified what was known about finance for the water sector, including recommendations on how to access new sources of finance.

country level study.<sup>4</sup> In order to facilitate the process and build the capacity of developing countries, the UN launched Millennium Project under the leadership of Jeffrey Sachs.<sup>5</sup> The project has developed a methodology on the needs assessment whose results are to be incorporated into country's planning.<sup>6</sup> The needs assessment provides a basket of interventions and the cost estimates for attaining the MDGs including that on drinking water and sanitation.

Following a variant of the needs assessment methodology developed by the Millennium Project, NPC/GON with the support of UNDP ventured for estimating cost of most of the targets of seven national goals. The study estimated US\$ 16.4 billion of total financial requirements at 2004/05 prices for the period 2005 – 2015, and revealed a total of US\$ 7.9 billion financing gap for reaching the MDGs and construction of rural infrastructures for the period of 2005 – 2015.

As to the drinking water and sanitation, total financial requirements was US\$ 1.96 billion for the 2005 – 2015 period, out of which total public investment requirement was US\$ 1.51 billion. It has been estimated that the government could mobilize US\$ 419 million, and therefore based on this the financing gap was estimated at USD 1.09 billion for the 11 year period (NPC and UNDP, 2006).

The recent thinking underpinning the attainment of the MDGs is the intervention of a holistic programme in a community or village in order to reinforce the achievement of one sector with other and achieve all the MDGs together. Such an approach has well recognized the fact that there is need for a balanced social and economic development for the development of a community, and that partnership between developed countries, government and community of developing countries is a must for launching of such a holistic programme. The case of the millennium village project in Africa as implemented with the major support of the Millennium Project involves per head expenditure of US\$ 100 per annum (Bloomfield, 2006; Tiwari, 2006).

The future of financing from donors is not that bright because current level of aid of 0.25 percent extended by developed countries falls far short of the 0.7 percent of their gross national incomes (GNI) towards which rich countries promised to work in Monterrey and Johannesburg. Moreover, donors prefer offering aid in: (a) the aftermaths of conflicts and war such as in Iraq; (b) new capital investments rather than the recurrent activities; and (c) outside government's budget. However, the millennium project estimated that even if the developed countries contribute to 0.54 percent of their GNI that will achieve the MDGs. While this reduced need of resources raises optimism of developing countries, the important thing is that how committed the developed countries are for the development of developing countries, otherwise even the reduced share will not be forthcoming.

Besides aid, the developed countries have to support in the form of trade and technology transfer. Provision for global public goods in the form of inexpensive medicines, effective vaccines and mass communications campaign, and use of information communication technology to attain some of the sectoral goals such as

---

<sup>4</sup> As the cost of water supply varies with their institutional arrangements, Devarajan et al (2002) advanced the opinion that it is difficult to provide a precise estimate of annual expenditure.

<sup>5</sup> The Millennium Project has developed a methodology for the needs assessments, which ultimately estimate the costs required for attaining the MDGs in a country. Following this methodology some countries including Nepal have already estimated the cost and the financing gap. The needs assessment carried in Africa estimated average annual financing needs of US\$ 100 per person for the period 2005 to 2015, and of which domestic outlays might cover as much as US\$ 40 per person per year, leaving only US\$ 60 gap for international support.

<sup>6</sup> The needs assessment maps out interrelated interventions needed to meet the MDGs between now and 2015 and quantifies the necessary human resource, infrastructure, and financial resources through dividing the economy into some clusters.

health and education are of significance. The developed countries need to increase their investment in such medicines and increasingly transfer their technologies, and that they need to increase their development assistance from 0.25 to 0.54 percent of their GNP, to support the MDGs in poor countries.

### 4.3 Changing Role of Government

Many countries have undergone major reforms to their utilities since 1990, with the aim of reducing the fiscal burden of financing public services, and improving the performance of dysfunctional utility operators. These reforms have often been successful in improving government finances, turning around enterprise performance, and expanding access to services. However, such reforms have resulted into tariff increases for essential services, decrease in public sector employees and huge assets transfers. As a result, utility reform has become politically and socially controversial and is strongly opposed by some constituencies.

Reform in the water sector involves decentralization of utilities to local level, depending on the political structure of the country (unitary or federal). Public sector provision remains the norm in the vast majority of cases, and some measures may be taken to reform utilities within the institutional context. While there have been numerous cases of private sector participation (PSP), it remains comparatively unusual and rarely involves transfer of ownership. Significant use have been made of various contractual forms of PSP, including management contracts, lease contract, concessions and build-operate-transfer schemes as a vehicle for financing new drinking water and waste water treatment plants. In many cases regulating remains implicit or incorporated into the contract for PSP. Regulatory agencies take a variety of forms, including municipal, state level, or national entities (Coudouel and Paternostro, 2005). While the PSP could improve service delivery, the access of poor to water needs serious government efforts.

### 4.4 Water Insecurity and Access of Water to the Poor

Human security is necessary for human development in today's world. If human development is enlarging people's options, then human security offers an opportunity and environment to exercise those options. Water security forms one component of human security. It has three components: availability, access and utilisation.

United Nations Committee on Economic, Social and Cultural Rights declares the human rights to water, which entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use. These five core attributes represent the foundations for water security. Yet they are widely violated.

The global human development report 2006 has cleared the myth that water scarcity is the results of low availability of water. The main message of the report is: "the scarcity at the heart of the global water crisis is rooted in power, poverty and inequality, but not in physical availability." Today, 1.1 billion people in developing countries have inadequate access to water, and 2.6 billions lack basic sanitation. Those twin deficits are rooted in institutions and political choices, not in water availability. Thus, overcoming the crisis in water and sanitation is one of the great human development challenges of the early 21st century (UNDP, 2006A).

Some other messages of the HDR 2006 are that: (i) the global water crisis overwhelmingly affects the poor, (ii) every person should have a basic minimum of 20 litres of clean water a day, and poor should get it free,

(iii) resolving the water crisis contribute to human development, (iv) poor pay more for water, and (v) lack of sanitation is costing lives.

It is said that the availability of water is positively correlated with the progress of nations. However, physical availability of water widely diverges across regions and countries of the globe. The United States and Australia have 100 times more storage per head than Ethiopia. The situation of Asia including South Asia is in between, but the poor access has limited their progress and prosperity.

South Asia including Nepal is very rich in the physical availability of water. However, the coverage is low compared to many other parts of the world. Within south Asia the access to water varies widely from about three fourths in Nepal to more than 90 percent of total population in Pakistan. Similarly, the coverage of sanitation varies from 30 percent of the population in India to 91 percent in Sri Lanka. According to the Asia Pacific Human Development Report 2006 the coverage of sanitation is lowest in Nepal among the South Asian countries. Therefore, on the front of access sanitation, Nepal is at the bottom of the list of the south Asian nations, indicating that Nepal is yet to strive for attaining the MDGs relating to drinking water and sanitation (UNDP, 2006B).

Access and utilization dimensions of water security are more critical in South Asia than the availability dimension. Even if water is abundantly available there, a significant proportion of people, majority of whom are poor, lack access to water. In those poor communities where there is access to water, many of them are suffering from water borne diseases because of poor utilisation of water including safe handling, storage and management of water. The situation further aggravates owing to low coverage of sanitation. Therefore, proper water utilisation and expansion of sanitation also requires adequate awareness on hygiene and sanitation.

People, especially the poor ones, lack access to water and sanitation because of their poverty or low level of affordability, due to their limited rights or public policies that limit access to the technology and infrastructures that provide water for life and for livelihoods. On the other hand, poor people pay more and bear the brunt of human development cost associated with scarcity.

Poor households pay much more than better off households. This situation is especially notable in Bangladesh where slum dwellers without access to safe drinking water are sometimes forced to buy water from vendors. In a slum area in Mirpur, Dhaka a muscleman had established several illegal water connections and was charging for their use a very high amount. Slum dwellers had to pay Tk.100 per month besides Tk.200 to obtain permission to fetch water from the illegal connections. Acceptable water quality was not even guaranteed because water line was passing through dirty places resulting in a high risk of water contamination. Besides this, poor households usually have to spend long time fetching water. The opportunity cost of this activity is high as this time could be invested in other much more productive activities. Eviction threat makes slum dwellers to be initially reluctant to install WATSAN facilities. Examples abound why poor people do not install water and sanitation systems from the case studies conducted in Bangladesh including those in Bangabari, Mirpur, Dhaka, and IG Gate Slim, Faridabad, Dhaka. As for sanitation, households with little economic resources may not be able to afford the construction of a latrine and were compelled to defecate in the open field, in a temporary latrine or in their neighbours' latrine as in Khokana, Nepal (see Vol II).

Water supply and sanitation services are often not delivered to the poor unless a project incorporates specific provisions to reach the poorest households. This is evident from the case studies conducted in Bangladesh and Nepal. Poor households are usually forced to fetch water from public taps while other households in the same area have private water connections (see Dhulikhel, Khairenitar, Ilam case studies, Vol. II). In order to reach all households, including the poorest, a project needs to incorporate specific provisions to target those

households. Otherwise, the poorest households may not be able to afford the investment needed to obtain improved water supply and sanitation services.

Against the above backdrop, a two-pronged strategies need to be adopted for improving the access to drinking water and sanitation. They are short term and long-term strategies. The short-term strategies need to focus on improving management of water and sanitation and expanding technological options. User group approach adopted by the government of South Asia is one of the models of management, which ensures community ownership and participation in the provision of water and sanitation services, and thus contributes to the sustainable human development. The long-term strategies include improving the power relation, ameliorating inequality and reducing poverty as pointed out by the Human Development Report, 2006.

Thus, providing water and sanitation to all requires a major feat for improving management and finance. On finance there are several financing mechanisms including official development assistance, multilateral financial institutions, international commercial lending, export credit agencies, private investment and operation, community initiatives and non-governmental organisations (Winpenny, 2003). The following sections details on the domestic resource mobilisation in two sections: design of tariff structure and local financing arrangements for the construction of water and sanitation schemes. Moreover, some major financial instruments that can be used for the domestic resource mobilisation bonds, loans, equity, guarantees, and subsidies.

## 4.5 Design of Tariff Structure

Though Water pricing is not a new concern in South Asia, yet in the past it remained as a futile exercise because of: i) the public opinion that water resource like other natural resources is abundant, ii) a religious belief that provision of water is a sacred activity; and more importantly (iii) the belief that it is the duty of state to provide water. However, full-cost approach of water pricing has received some acclaim among developing countries' planners and practitioners in recent years. There are three driving forces for this: i) the realization that the globe is finite and so is water resource, ii) inability of the government to fulfil water demand of rapidly growing population at subsidized price; and (iii) growing concern on accumulating subsidies that has put a lot of strain on the government treasury in developing countries.

The amount of resources required for water services is much larger than the capacity of resource mobilization in poor developing countries. Given the limited coverage of water supply and sanitation services to the population, increased need of expansion of services for meeting the growing needs of rapidly growing urban population in those countries; increase in incremental cost of water; and provision of safe drinking water for economic and health benefits, their governments are under stress to provide water for the whole population.

Appropriate pricing policies can help in reducing the constraints set from the resource gap by assisting in the development of better investment strategies and thereby contributing to the attainment of the MDGs. Besides, it can have important effect on efficient use of water resources, on urban land use, and more broadly on allocation of economic resources of a country or a region (Bahl and Linn: 1992). Countries of the world are found levying different types of charges:

- A fixed service charge per billing period,
- Minimum charges,
- Charges linked to number of fixtures or water using appliances,
- Installation charge,

- Charge linked to lot size
- Advalorem taxes
- Water and sewerage charge, etc.

Growth and equity are two basic objectives of a pricing policy. But in respect of pricing of water service an additional objective of financial viability is necessary in most of the developing countries where most of the water utilities are not operating financially sound manner. On the whole, the considerations that are to be taken into account while designing tariff structure are presented below.

#### **4.5.1 Health consideration**

Determining water charges based on the principle of full cost pricing may sometimes lead to discourage use of water and thereby promote health hazards. Research has shown that 20 – 40 litre per capita per day (lcd) of readily available water, if accompanied by adequate waste disposal facilities and sound hygienic practices, is sufficient to attain the main health benefits of water use. Consumers therefore should be given an incentive to consume 40 lcd of safe water if they are not willing or able to do so at their prevailing income and marginal cost price. Thus an introduction of lifeline tariff is required for poor people. At the average family size of five members in urban areas, the monthly minimum consumption required at the rate of 40 lcd is 6 M3 of water. However, because of the type of facilities used in the urban area, it is likely that water consumption is higher than 40 lcd. The 10 M3 of basic allowance per month in Nepal allows 66 lcd for five member families in urban area of Nepal.

#### **4.5.2 Administrative consideration**

Administrative consideration bears a critical significance in the design of water tariff. A basic issue is whether or not metering is efficient. In fact, the cost of metering includes not only capital cost of meter and its installation but also the cost relating to meter inspection, reading, repairing, accounting and billing. All of these costs should be weighed against the benefits expected to be derived from metering. Generally, metering is justified where water is scarce and its production and treatment cost is high. But many of the meters do not function properly because they are clogged because of lack of regular supply or poor quality of water or due to leakage of pipes. While metering system increases administrative and management burden, it is justifiable that the water be metered because of its scarcity. However, all the additional administrative cost that arises because of metering is to be accounted into tariff structure.

There are several examples, which show overuse or inefficient use of drinking water in the cities of developing countries such as in Dhaka, where the tariff structure is not progressive because of lack of metering system.

#### **4.5.3 Institutional consideration**

Pricing structure has a close bearing with the institutional framework. Generally, it is held that an institution with a single service function is financially self-sufficient as compared to a multi-functional service agency.

The emergence of the concept of welfare state in the past increased the responsibilities and functions of the government. As a result, today's governments of developing countries are overburdened. This coupled with inefficient management and bureaucracy of public agencies asks for a helping hand from private sector.

The utility sectors have experienced a broad range of reform measures which can be broken down into the following building blocks: public sector reform, private sector participation, regulatory reform, sector restructuring and market liberalization. The extent of private sector participation ranges from service/management contract to lease to Build-Operate-Transfer (BOT) to full or partial divesture.

#### **4.5.4 Financial consideration**

Of all the considerations, financial consideration is the most important consideration in urban water supply at present. Financial consideration is of crucial importance in assessing alternative water tariffs. For various reasons, self-financing water supply systems are attractive. More importantly, since self-financing operation is associated with the efficient management of public utilities, financial self-sufficiency is a guiding principle of national policy for the water sector in some developing countries and a common objective of international lending institutions.

The principle of cost recovery in urban water supply has yet to be realized in South Asia. Since under present arrangements tariff decision is taken at the highest political level, and there is a fear of urban unrest if tariffs are raised, the tariff changes are rare, delayed, and are insufficient to provide all resources required in this part of the world.

As water utilities do not pay proper attention on the financial consideration or the efficiency principle, this has encouraged unnecessary use of water in some localities and premises and dishonoured the principle of equity in other localities where people do not get water even for drinking. Moreover, it has blurred the equity principle between users of larger and smaller towns, as there is perverse flow of resources. Therefore, efficient pricing with equity considerations is necessary. In fact, discriminatory pricing across the cities of a developing country is necessary because the cost of water production and the ability to pay people across the cities differ widely.

Water price is generally determined either by calculating Average Incremental Cost (AIC) or return on fixed assets. In developing countries, full cost pricing is still difficult to implement, and therefore generally user charges are fixed so as to cover fully the operation and maintenance cost, with the proviso that capital cost is to be borne from public budget. However, in urban areas, effort is made for covering part of capital cost as well apart from O & M cost.

#### **Box 1: Cost of Water in 28 Urban Areas of Nepal**

Nepal Water Supply Corporation (NWSC) operates in 28 major towns of Nepal including three towns of Kathmandu valley whose consumers are larger than the other 25 NWSC towns of Nepal.

At 10 percent rate of return, the cost per cubic meter of produced water in the 28 towns averaged at Rs 4.1 in 2001, which reduced to Rs 3.3 in 2005. However, there is high leakage in developing countries. Therefore, per M3 cost of distributed amount of water increased to Rs 6.9 and then it decreased to Rs 5 in 2005. The decrease in water cost is not only because of increased water production but also because of the decrease in leakage, which reduced from 44 percent in 2000 to 35 percent in 2005.

Although unit cost of water based on return on fixed assets decreases with years, there is increase in annual expenditure owing mainly to increased responsibility of water management, and collection of tariff, etc. Therefore, when it is also included in the cost, the unit cost of water increases to Rs 8.7 per M3 of produced water and Rs 14.7 per M3 of distributed water at 10 percent rate of return on fixed assets. Such unit cost of the produced water hovers between Rs 8 to 9 per M3, and for the distributed water it ranges between Rs 14 to 15 per M3 of water.

Source: Records of Nepal Water Supply Corporation

In essence following principle is followed for determining rate of tariff.

- i. Return on fixed assets and properties
- ii. Meeting current expenditure incurred for water management
- iii. Meeting current expenditure and return on fixed assets
- iv. Full cost pricing of water

A study of urban water supply of 28 towns by the Nepal water Supply Corporation shows that per M3 cost of distributed amount of water was NRs 6.9, which decreased to NRs 5 in 2005. However if the annual expenditure spent on running office is included then the cost per M3 further increased to NRs 13.5 in 2005 (Box 1). However, as water tariff is fixed at low level mainly taking into account the operation and maintenance cost, most of the utilities such as that in Mahendranagar Nepal are running at loss (Box 2)

The water tariff fixed in the countries of South Asia hardly meets even the operation and maintenance cost. Moreover, they are not increased annually even at the par of inflation because of the fear of opposition. At times such opposition gets political colour. Because water tariff are not increased annually, it is found decreasing in real terms. The case study of Dhulikhel is a clear example of this fact which shows that the lifeline rate increased on the average by 4 percent annually during 2002 – 07, whereas rate of inflation was more than five percent during the period. Moreover, the water tariff was not increased at the proportion of the base rate of 2001/02, and therefore the increase was regressive leading to benefit better off consumers (Box 3). It is to note that water tariff in Dhulikhel is determined by the Water Management Committee and not by the government. Despite this fact, the increase was not sufficient to cover inflation. This suggests the financial consideration needs to be strictly adhered to in order to make the system financially sustainable.

**Box 2: Water Utility in Mahendra Nagar, Nepal, Running at Loss**

As all other branch offices, the major source of income of NWSC Mahendranagar Branch Office is the water tariff, fine on delay payment and connection fees from new consumers which was NRs.2,265 including deposit for meter.

The annual income of NWSC Mahendranagar Branch is not quite enough to cover its annual expenses. It has been running with operating loss since 2000/01. Further, the loss seems to be increasing in the subsequent years. Lack of increase in the water production and new connections on the one hand and on the other an increase in expenditure on repairing and maintenance are the major factors responsible for degrading financial position of the branch office. Slight increase in income is noted due to increase in the water tariff. Therefore, it has to rely on the budget from the central office of the NWSC

Source: Case Study on Mahendra Nagar (Vol II)

**Box 3: Decrease in Real Water Tariff**

A Case of Dhulikhel Water Supply System, Nepal

Amount (m3)	Water Tariff		
	2001/02	2006/07	Annual Increase (%)
up to 10	5	6	4
11 - 25	6	6.5	1.7
26 - 50	9	10	2.2

Source: Case study, see vol II

Like in other sectors, community participation in drinking water and sanitation has become the characteristic feature since long past. However, the community participation was limited to the implementation of drinking

water schemes in most of the water supply projects in South Asia including Nepal where communities have to contribute certain proportion of capital cost, especially in rural areas. The provision in Nepal is that community has to contribute 20 percent of the total capital cost – either in the form of in-kind such as labour or cash. However, this rule has become difficult to implement in urban areas because of high cost of installation of water system there.

Rural and poor people pay more for water than urban people. For example, the consumers of Damak, Dhulikhel, Ilam and Mahendranagar did not contribute any amount either cash or kind as capital cost, whereas the people of rural area also cover part of the capital cost. This indicates a perverse flow of subsidies from rural to urban areas in the provision of water services.

The inherent policy is that the urban water utilities have to bear all the cost of operation and maintenance and part of capital cost to the extent possible. Despite this fact, most of the water utilities in urban areas even failed to bear the full cost of the operation and maintenance, requiring for the involvement of private sector to improve their management.

Unlike the case of drinking water where there is perverse flow of government resources, the government as well as Non-Government Organizations provide subsidy for the construction of on- site sanitation units up to the sub-structure level. The sanitation intervention in Khokana, Nepal is a case where ENPHO provided sanitary units giving as high as of 80 percent of subsidies in the beginning (Volume II).

#### **Box 4: Community Participation in Terms of Financial Contribution**

- ⊙ Poor also pay part of the capital cost
- ⊙ Poor pay more than what rich people pay
- ⊙ Community contribution is higher when:
  - ◆ There is a felt need
  - ◆ There is user groups approach
  - ◆ There is strong leadership
  - ◆ The intervention is small – Dandatole, Srinagar and Alokhati
  - ◆ Users are effectively participating

### **4.5.5 Equity Consideration**

The Human Development Report 2006 states that poor pay more than what the better off household with connection pay for water. In slum area of a city, poor pay 5 to 10 times more per litre of water than wealthy people living in the same city. For example, in Dakar poor households using standpipes pay more than three times the price paid by household connections to the utility. In Bangladesh, slum populations pay 50 times higher prices than those who have been connected with Dhaka Water and Sanitation Authority (DWASA). The DWASA is using at flat rate of 5.25 taka per M3. The flat rate has been implemented because metering covers only 40 percent of the total population.

Similarly, poor and landless people of many other countries pay more than what the people of London and New York pays (UNDP, 2006). It is a gross misinterpretation that the poor are paying more because of their ability and willingness to pay. They are bound to pay because they have no option or because the return from higher pay of water could be higher than spending more time for fetching water in urban areas.

In fact, with the provision of rising block tariff irrespective of the type of connection, the consumers using standpipes have to pay more than what the private connection holders pay. The HDR 2006 has pointed that the rising block tariffs in Nepal has been inequitable and unjust. The report recognizes the fact that it is generally

the better off households, which are benefited from subsidized water, however, it suggests for targeted subsidy (UNDP, 2006A).

As to the question of why poor pay more than rich, the Report advanced three main reasons:

- i. Higher connection fee which is around US\$ 1,000 that is equal to three months' income of the poor households;
- ii. Lack of land or assets and therefore the poor and slums are not legally entitled for the connection;
- iii. Rising block tariff has effect on poor than the rich as intermediaries distributing water to the poor, have to buy large amount of water at higher tariff

Some of the methods adopted to incorporate equity concern in developing countries are following:

- i. Rising block rates
- ii. User fee linked to the value of connected property
- iii. Financing through a general property tax
- iv. Water charge varying with socio-economic characteristics of neighbourhoods
- v. Higher charges for industrial and commercial users compared to residential consumers
- vi. Cross subsidies with other urban services
- vii. Urban-rural cross subsidies
- viii. Charges varying with size or number of taps
- ix. Subsidised consumption from public taps
- x. Provision of basic allowance that offer minimum quantum of water to poor households at a concessionary price

#### **4.5.5.1 The Basic Allowance**

There is a need to provide a minimum quantum of water to attain health benefits to each household at a concessionary price. This minimum quantity may differ from place to place, depending on the type of settlement, geography, climate, socio-cultural factors, and sanitation technology. Research has however shown that 20 – 40 lcd water is enough to ensure health benefits. The basic allowance for most of the towns in Nepal where NWSC and DWSS operates is 10 cubic meter of water. However, such a minimum allowances differs with the differences in the management arrangement, ranging from 7 to 10 cubic meter (Table 4-1).

*Table 4-1: Design of Tariff in the 10 Water Supply Systems, Nepal*

System	Life line rate		Progressive Tariff	Progressive Fine
	Vol (M3)	Tariff (Rs)		
Damak	8	45	Yes	Yes
Ilam	7	25	yes	Yes
Dhulikhel	10	60	yes	Yes
Khokana	10	50	yes	Yes
Alokhiti	Flat	100/125	No	Yes
Khadipakha	10	50	Yes	Yes
Khairenitar	8	40	Yes	Yes
Dandatole	Flat	65	No	No Fine

Shreenagar	Flat	10	No	No Fine
Maheandranagar	10	50	Yes	Yes

Source: Case study, see vol II

#### **4.5.5.2 Discriminatory Pricing**

The rationale behind discriminating pricing is the equity consideration of a tariff structure. The provision of basic allowance, free water from standpipes, rising block rates, differential price for household and non-household use of water – all are examples of discriminatory pricing. The current NWSC tariff structure in Nepal involves part of these features. There is water tariff for public taps but no differential price for household and non-household use of water.

Different prices according to use of water is justifiable, but whether commercial and industrial use of water should be charged high depends on the country's economic policy. In Nepal there was differential rate of water tariff for household and industrial consumption in the past, but now the rate varies with the size of the connection. In Bangladesh there is different rate of the industrial and household consumption.

#### **4.5.5.3 Subsidy**

As to the question of whether urban water should be financed from general taxation there is little ground in that there will be reverse subsidy flow from poor to rich. However, it is not unjustifiable if urban water is financed from other taxation specific to urban community. The levy of developmental charge in the form of property taxation can be one solution. Some other taxes like tax on hotel and restaurant bill, a specific tax on rooms of a hotel, houses can be further source of revenue which can be used to subsidize water when the price of water will cost high giving rise to political and public resentment.

#### **4.5.5.4 Provision of Standpipes**

From the equity point of view, there is a provision of standpipes in several countries. UNDP Human Development Report 2006 mentioned that in Kathmandu the NWSC reaches about three quarters of population but half of the poor depend upon public taps (UNDP, 2006A, p. 82). The municipality and/or the government pay the charge of such standpipes. However, as the payment is not timely and regular, there was large amount of outstanding bill. Therefore, the government has recently adopted a policy of discouraging standpipes and converting this to community pipes. This policy has already been in implementation in the DWSS service towns; however, such a provision has also been made by the Kathmandu Valley Water Supply Management Board (KVWSMB), which will be implemented after handover of the management of NWSC to a private company in near future. According to the provision, for the first time, tariff will also be charged on water consumed from nearly 1,000 standpipes (public taps) in the Valley. These will be fitted with meters and groups formed to share charges for the water consumed from each tap (The Kathmandu Post, 19 November 2006).

According to the approved tariff structure in Kathmandu valley, for the metered domestic consumers, who constitute the upper class of society, the block subsidy of NRs. 50 for the first 10 M3 will remain constant, while the charge for every additional 1,000 litres will reach as much as NRs 23 from the existing NRs 15. For non-metered consumers, who cannot afford private taps but have not been supplied metes by NWSC so far, the flat rate will go up from the existing NRs 360 to NRs 552. For standpipes used by the poorest in the Valley, the tariff for every 1,000 litres, applicable from the first 1,000 litres will reach NRs. 16.10 (Table 4-2).

Thus, while rich will pay only NRs 50 for the first 10, 000 litres, the poorest will pay NRs 161 for the same from the standpipes. The Human Development Report 2006 states at the chapter on subsidies, "For example... and Kathmandu, Nepal, apply a rising block tariff structure, but the subsidies benefit the non-poor than the

poor...” In Kathmandu the average non-poor household receives 44 percent more subsidy than the average poor household. This indicates that either the water charges for the stand posts be decreased or that of private connections be increased in view of the equity considerations.

**Table 4-2: Water Tariff Structures of Private Connections and Stand Pipes**

		2005	2006	2007	Users
Standpipe Tariff /1,000 litre	Free of cost		NRs 6.65 (35% of NRs.15)	NRs 16.10 (70% of NRs.23)	Poor Slums
Stand pipe tariff /10,000 litre	Free of cost		NRs. 66.5	NRs 161.00	Squatters Poor renters
Private Connection Tariff /10,000 litre	NRs. 50	NRs. 50		NRs. 50	Middle and upper class family who can afford private connection
Remarks based on the use of. 10,000 litre	OK		Standpipe user has to pay more for the same quantity of water	Stand pipe user has to pay more than 3 times for the same quantity of water	Thus poor get penalized. So, reform is not pro poor. There is inequity in the distribution of subsidy.

The monthly water tariff for un-metered domestic use (1/2") pipe is relatively very high, promote for meter connection.

Source: NGO Forum for Urban water and Sanitation (2007)

## 4.6 Tariff Structure: Some Basic Practices in Nepal and Bangladesh

Water tariff rate differs from country to country and within the country from one system to another. Various tariff structures are in practice - flat rate, fixed rate, progressive rate, and regressive rate. The tariff structures of 12 Nepal case studies are given in Table 4-3, and some other findings related to financing of water supply and sanitation is given in Box 5.

**Table 4-3: Water Tariff in 12 Water Supply Systems, Nepal, 2007**

Water Supply System	Basic Allowance			Unit Rate for Additional Consumption (NRs)	Tariff Structure	Remarks
	Amount (M3)	Life Line Rate (NRs)	Unit Rate (NRs)			
Ilam	8	25	3.13	NRs 5.5 (8-30 unit) NRs 6.5 (31-50 unit) NRs 9.0 (51-100 unit) NRs 10.0 (100+unit)	Progressive	Tariff rate set to cover O & M cost

Water Supply System	Basic Allowance			Unit Rate for Additional Consumption (NRs)	Tariff Structure	Remarks
	Amount (M3)	Life Line Rate (NRs)	Unit Rate (NRs)			
Damak	8	45	5.63	NRs 8.0 (9 to 20 unit) NRs 10.0 (21 to 30 unit) NRs 11.0 (31 to 50 unit) NRs 12 (50+ unit)	Progressive	Current lifeline rate set based on cost of production
Dhulikhel	10	60	6.0	NRs 6.5 (11 to 25 unit) NRs 10.0 (26 to 50 unit) NRs 22.0 (50+ unit)	Progressive	Tariff based on O&M cost
Khokana	10	50	5.0	NRs 15.0 for additional unit above 10 unit	Progressive (Partially)	Tariff determined by NWSC central authority
Aalokhiti	-	-	-	Ikhachhen NRs 100/month Nagbahal NRs 125/month	Flat rate	Tariff is based on O&M cost and capital cost recovery
Khadipakha	10	50	5.0	NRs 15.0 for additional unit above 10 unit	Progressive (Partially)	Tariff determined by NWSC central authority
Khairanitar	8	40	5.0	NRs 5.7 (8-14 unit) NRs 8.5 (14-20 unit) NRs 10 (above 20 unit)	Progressive	Tariff is determined to cover O&M, loan, future expansion cost, emergency maintenance cost, and ability & willingness to pay
Dandatole				NRs 65 including NRs 5 for regular O&M cost	Flat rate	Tariff is based on timely repayment of loan; O & M cost, ability to pay.
Shrinagar				NRs 10/month	Flat rate	Tariff is based on O&M cost only
Mahendra Nagar	10	50	NRs 5.0	NRs 15.0 for additional unit above 10 unit	Progressive (Partially)	Tariff determined by the NWSC central authority

Of the 12 case studies, three represent NWSC system where minimum tariff is NRs 50 for 10 cubic meter of water and NRs 15 is for additional per cubic meter of water consumption. Thus, tariff structure is progressive, however, there is only one bloc of tariff structure. Compared to the NWSC structure, some of the water supply outside the NWSC system has more scientific and progressive tariff structure such as in Ilam, Damak and Khairanitar, which are under the DWSS operation. There are some systems run by user groups, which have flat rate such as in Aalokhiti, Dandatole and Shrinagar. While there is element of cost recovery in Aalokhiti system, the other system does not have. The water tariff is set low in Dandatole because consumers have paid significant amount for capital cost recovery against their ability to pay, as this is the poor community.

Compared to the Bangladesh System, the water Tariff in Nepal is progressive. In case of DWASA the rate is Taka 5.25 per unit of water consumption irrespective of total amount of water consumed. Given the fact the exchange rate between Taka and Nepali Rupee is about 1, it can be said that water tariff in Dhaka (Taka 5.25) is similar to that of the Kathmandu where per cubic meter of water tariff is NRs 5 for the basic allowance of 10M<sup>3</sup>. But the water tariff is the same Taka 5.25 for water consumed over 10M<sup>3</sup>

**Box 5: Financing of Water and Sanitation - Some findings from the Nepal Case studies**

- ⊙ Life line rate is around Rs 50 for 8 to 10 cubic meter of water
- ⊙ Progressive water tariff
- ⊙ Tariff rebate for early payers and/or fine for the later payers
- ⊙ Water tariff and interesting earning on the bank deposits are the major sources of revenue
- ⊙ Salary and allowances are the major sources of cost
- ⊙ In real term water tariff is decreasing
- ⊙ Collection rate is improving
- ⊙ Water tariff is hardly sufficient for the operation and maintenance
- ⊙ Difficult to increase tariff when consensus of all is sought
- ⊙ Financial sustainability depends on transparency and accountability
- ⊙ Easy collection when there is financial transparency
- ⊙ Provision of financial incentives is necessary for increasing tariff payment
- ⊙ High financial contribution in mini water systems
- ⊙ Financial participation is high when there is strong leadership and felt need
- ⊙ Partial subsidy up to substructure in case of sanitation

Source: Case studies, Vol II

where as it is NRs 15 in Kathmandu. However, there is different tariff rate of household and industrial consumption in Bangladesh. Some of the Bangladesh case studies have mentioned that community people are paying monthly tariff on flat rate besides monthly instalment payment of capital cost. But none of the case studies has mentioned tariff rate and structure

## 4.7 Local Financing Mechanisms for Water Supply and Sanitation

Community contribution of the capital cost depends on several factors including financial transparency, accountability, leadership and size of system. Good leadership and small system attract higher contribution such as in Alokhati and Dandatole, Nepal. Generally, small systems are supported by I/NGOs, whereas the larger ones by big donors like Asian Development Bank with the partnership of government.

Payment of the capital cost by the community takes different forms. Sometimes users repay a loan on instalment basis, such as in Dandatole and Butwal, Nepal or other times a large amount is charged at the beginning of the intervention as a connection fee such as in Khairenitar and Ilam, Nepal.

As for sanitation, generally organizations provide subsidies to build latrines up to pan level. It is also very common to provide subsidies in kind, giving materials instead of money. Compared to the drinking water system, the household contribution in private latrine intervention is high because former is public property, whereas the latter is private household property. Households generally contribute all unskilled labour and also assume the responsibility of constructing the superstructure of latrine.

In Bangladesh many slum areas have provided with WATSAN facilities following a particular capital cost sharing strategy. Households have been divided in 5 groups depending on their economic situation. Every

group bears a different portion of the capital cost, relatively better off households pay higher and less better off pay less proportion of the capital cost. In the extreme, ultra poor households are exempt of paying any capital cost. This arrangement was designed only in order to create ownership among the beneficiaries because capital cost is ultimately borne by the donor organization (Most of the Bangladesh Case Studies, Vol II).

Another model with increasing acceptance in sanitation sector is the Community Led Total Sanitation. This model provides only software to develop awareness between community people. The community people themselves do their own appraisal of open defecation. Community builds latrines bearing all capital cost. The implementing organization only provides technical support and health and hygiene education to the beneficiaries such as in Sreepur and Basabaria case studies of Bangladesh (See Vol. II). In small scale projects users become the owners of system. Sometimes, users have to bear a high cost for a certain period but after repaying the loans the system belongs to them. In the long-term tariff rate can be reduced such as in Aalok Hiti and Dandatole case studies of Nepal.

#### **4.7.1 National Strategy for fund mobilisation**

Until recently water and sanitation sector in almost all developing countries has been under public management. With the growing demand of water in urban areas, public sector could not efficiently fulfil demand for water. Consequently, in many urban areas of developing countries, involvement of private sector has been started for management of water utilities. Also, Government of Nepal has recently decided to hand over the management of Nepal Water Supply Corporation to private sector. However, compared to other utilities, there is less involvement of private sector in water and sanitation services.

In the countries of South Asia decentralization policy has been adopted for sustainable operation and maintenance of drinking water and sanitation interventions. Compared to the NGO interventions, involvement of local bodies is less in the countries because of the difficulty in collecting charges to cover capital cost and operation and maintenance cost. The Local Self-Governance Act 1999 of Nepal has made responsible to local bodies to prepare, implement drinking water projects and repair and maintain after their operation. Following to this, Rural Water Supply and Sanitation Policy 2003 of Nepal stipulates that development and operation of drinking water and sanitation services will be done at the leadership of local community, which will identify the necessity of project, its selection, formulation, implementation and management by following participatory approach. The Policy also stipulates that capacity of community will be enhanced for empowerment and management of water supply systems, and that public awareness and health education will be an integral part of the programme. With the increasing responsibility of the local bodies and communities, there is need for building their capacity.

**Table 4-4: Capital Cost Sharing Mechanism, 10 Case Studies, Nepal, 2007**

<b>Project</b>	<b>Community</b>	<b>Other Major Stakeholders</b>
Aalokhiti	87.4%	16.7% (Municipality)
Dandatole	80% for water Provision of a five-year loan to the community at no interest cost 62% for toilet construction	20% for water  38% for toilet construction (Lumanti/Water aid Nepal/Municipality)
Dhulikhel	0%	100% (GTZ/GON)
Khadipakha	53.5%	46.5% (Lumanti/Water aid Nepal)

Project	Community	Other Major Stakeholders
Khairanitar	50% (20% before and during construction period and 30% loan with 8% rate of interest by ADB)	50% (GON/ADB)
Khokana	0% Drinking water 30% for toilet construction 25% for sewerage	100% for water (NWSC) 70% for toilet (ENPHO/Water Aid) 75% for sewerage (VDC/DDC)
Mahendranagar	0%	100% (GON/ICM/JICA)
Srinagar	41%	59% (NEWAH/Municipality/DHSP)
Damak	0%	100% (GON Municipality/British Government/LWF)
Ilam	0%	100% (GON/JICA/Municipality)

Some successful sanitation interventions in South Asia are Orangi Project in Karachi, Pakistan where community has managed their offsite sanitation themselves, and Sulabh pour-flush Sauchalya which an NGO, Sulabh International, has been constructing, operating and maintaining more than 5,500 public toilets at full cost recovery in most of the towns of India and in some other neighbouring countries, and had been able to construct more than one million Sulabh private toilets in the houses of India since 1970. The concept of Total Sanitation intervention has also been successful in Bangladesh as this is cost effective and therefore affordable for community. Because the approach is flexible, the poor can also build toilet as per their ability to pay.

The national strategy for fund mobilisation boils down to local financing and/or community contribution. However, capital cost is generally covered by joint support of donors, government, I/NGOs and community. In the 10 Nepal case studies, capital cost sharing by community ranges from none to more than 87 percent. In smaller system, capital cost contribution of the community is high compared to larger system such as those run by the NWSC (Table 4-4). A review of the 20 case studies of Bangladesh and Nepal shows different form of financial arrangements made with the community for the mobilisation of capital cost. Major forms of arrangements and their brief description follow.

#### 4.7.2 Partnership between donors, local body and the community

Generally new water supply project is build with the support of donors by the government at the centre or at the local level. This is further complemented by the effort of community generally in kind. A case of such a financing mechanism is the construction of Damak

##### Box 6 Construction of Damak Water Supply System: Cost Sharing Arrangements

The cost of Damak Water Supply Project during its construction and expansion phase was largely borne by donor agencies. Government of Nepal and Damak municipality also provided some technical, administrative and financial assistance. Total project cost of the system including the expansion cost was NRs.31,828,000, of which initial cost was NRs.19,560,000 (61.5%) while the expansion cost incurred at different phases was NRs.12,268,000 (31.5%). Initially, the British Government provided NRs.17,652,000 which was used for building two deep tube-wells, a reserve tank and distribution pipeline of 19 km. Damak Municipality contributed only 5 percent of the cost in terms of administrative cost along with land for the establishment of users committee office. The Department of Water Supply and Sewerage of the government provided technical assistance. During the expansion phase, the British Government provided a financial support of NRs.2, 987,483 for the installation of the treatment unit and Lutheran World Federation provided NRs.3,140,000 for the construction of additional 2 deep tube-wells.

Water Supply and Sanitation Project in Nepal, where most of the aid came from the British Government and only five percent of the cost was borne by Damak municipality. However, later Lutheran World Federation joined hand and contributed to the construction of two deep tube wells. The specific details are given in Box 6. However, there was not financial contribution of community during construction phase. Such a modality was also adopted in the construction of Dhulikhel water Supply System, where all the financial cost was borne by GTZ with some support from Department of Supply and Sewerage of the Government and Dhulikhel municipality. However, the community has contributed significant amount of time in planning and management including source identification, agreement with the community where the source is located, collecting operation and maintenance fund of 2,000, development of proposal and its submission to the GTZ.

#### **4.7.3 Partnership between NGO, local body and community**

A variant of the Government-NGO-Community model of the financial arrangement is found where local bodies work with NGOs rather than donors directly. Generally, local bodies are involved in such activities when I/NGOs are with sufficient fund for the provision of services, otherwise there is a need for the involvement of central government for making provision of financial resources.

The case of Shrinagar Drinking Water, Health and Sanitation Project where a Nepalese NGO called NEWAH with the financial support of Water Aid has implemented the project. However, in case of NGO operation the project is not that big as the case illustrates Box 7.

##### **Box 7: Shrinagar Drinking Water, Health and Sanitation Project, Surkhet, Nepal: Cost Sharing Arrangements**

The total project cost is estimated at NRs.2, 034,648 for the construction of 10 water points and 99 sanitary units. The most costly activity of the project was toilet construction, followed by drinking water scheme construction. Health education programme and community management and support programme share only a small percentage of the total budget with around 3% each.

Among the partner organizations NEWAH contributed slightly less than half of the total cost, DHSP contributed about 11%, and Birendranagar Municipality under Rural-Urban Partnership Programme contributed 1.7 percent of the total cost. The contribution of local community was as high as 40.7 percent of the total project cost.

Total community contribution is estimated at Rs.3152 per household for drinking water project and Rs.4364 per household for latrine construction. Community contribution included unskilled labour (calculated as NRs.140/hour), local material and portage cost of construction materials from the nearest delivery point to the project site. Besides, community also contributed a small operation and maintenance fund before the construction works started. The amount collected was of Rs.1,000 for each water point.

#### **4.7.4 NGO as intermediary/implementer between the community and water-related organizations**

The most usual mechanism for cost sharing arrangements and/or implementation of drinking water and sanitation interventions is that NGOs serve facilitator and/or implementers of projects accessing funds from I/NGOs or donors. In the implementation of project they go hand in hand with the community and therefore they are able to muster support from the community. There are several cases from the 20 project studies conducted in Bangladesh and Nepal, representing such a financing mechanism (see Volume II). Most of the case studies of Bangladesh follow this mechanism where a local NGO with support of I/NGO such as Water

Aid has implemented small community water and sanitation interventions. Some of the case studies representing this variant are described below.

#### **4.7.4.1 Khadipakha Water Supply and Sanitation Improvement Project, Nepal**

An NGO called Lumanti has implemented the project with the financial support of Water Aid. In total, Lumanti contributed a grant of NRs.3, 233,223 (53.5%) and community contributed NRs.6, 044,010 (46.5%) of the total cost of the Sewerage and Sanitation Project. The project was implemented in three phases. The community contribution increased with the phases. The first phase involved provision of water and the second phase supported construction of sewerage cum drainage covering slab, slab supporting pillar and household toilet. Of the total cost, community contributed 61.8 percent of the cost. During the third phase of intervention, 50 household toilets were built in the project area and sewerage and drainage system were further improved with the construction of side drain as well as sewerage line with hume pipe. On an average, the cost per toilet is around NRs.12,000 of which Lumanti supported 40 percent and the rest was borne by households themselves. The total cost of a latrine varies from household to household because Lumanti provided materials, skilled labour and technical support only up to pan level, whereas the concerned households borne all the construction cost of latrine above pan level depending on their will and capacity.

Besides, the Irrigation Department of the Government of Nepal provided 400 bags cement and galvanised iron nets to construct gabion wall in Samakhusi River. Before the construction of sewerage system, a maintenance fund for the sewerage was also created with the contribution of NRs.500 from every household and some token amount of support from Lumanti. The fund was deposited in a bank with the intention that it would be used when major repairs of the system are required.

#### **4.7.4.2 Khokana Water Supply and Sanitation Intervention**

ENPHO, an NGO, with the financial support of Water Aid assisted Khokana community for the construction of ECOSAN latrine. The latrine was subsidised in order to promote environmental sanitation. As the latrine built in a household has a positive externality to the other household, offering a targeted subsidy to the poor was justifiable.

On the average, the total cost for a ECOSAN latrine ranged from NRs.15,000 to 20,000 depending on size, structure, material and time. The construction cost of ECOSAN latrine has declined due to improvement in design of latrine. Users had to contribute at least 20% of the total cost of latrine. Community contribution has increased markedly from the first phase to the third phase.

#### **4.7.4.3 WATSAN Intervention, Bangabari, and Ta Block Slum and Ghuntigar Slum Dhaka; Hazighona, Chittagong**

Generally with the financial support of Water Aid, NGOs like DSK and PSTC have implemented drinking water and sanitation interventions in slums as well as other poor areas of Dhaka and Chittagong. The NGOs provided technical, financial and software support into the project area for the construction of water points and/or sanitary latrines. First the NGOs mobilised community with the software activities. Once the communities decided to construct water point or latrine, the NGOs provided fund for hard ware construction. The community contributed financial and in-kind support for the construction. The amount of support that a household has to contribute depended on the economic status of households. This is being decided by categorizing community into some groups, which are done by using a participatory rural appraisal tool.

#### **4.7.5 Local body and community partnership**

There are some instances where the community with some support of local bodies or other organisation constructs small drinking water schemes. The case of Aalokhiti demonstrates the fact how the community contributed NRs 450,000 when they received a grant of NRs 65,000 from their municipality.

##### **4.7.5.1 Aalokhiti Conservation and Drinking Water Supply Project**

The total capital cost of NRs.515,000 of the Aalokhiti Drinking Water Supply project was borne by community and municipality. Community contributed NRs 450,000 (87.4%) of the total capital cost. This includes construction of a tower worth of NRs 300,000, and network of transmission and distribution points worth of NRs 100,000, and NRs 50,000 worth of labour. Lalitpur Sub-metropolitan City contributed a reserve tank worth NRs.65, 000, which is 12.6% of the total cost. The main reason for high community contribution was strong leadership and small amount of the project.

#### **4.7.6 Pooled resources and revolving fund for water supply and sanitation**

##### **4.7.6.1 Dandatole Water Supply and Sanitation Project, Butwal, Nepal**

Dandatole intervention was designed following partial capital cost recovery principle. Lumanti and Butwal Municipality created an Urban Poverty Fund to improve water supply, sanitation and waste management conditions of poor communities of the municipality. Out of the total amount of cash cost 20 percent was offered as grant and the rest 80 percent as loan at zero interest rate to the community for the improvement of the water supply. The community has to pay back the loan within five years. There was a provision of using the repaid fund in poverty reduction activities in other poor communities of the municipality.

The total cost of the WATSAN intervention in Dandatole was NRs.2,488,269. Out of this amount NRs.707,505 was the cost of water supply project and NRs.1,780,764 for the cost of household latrine. The major supporter of the water supply project was WaterAid Nepal, which provided 66.5% of the total project cost through Lumanti. Municipality also provided a considerable amount with 17% of the total cost. Other minor contributions came from Action Aid and UMP-UNDP (2.5%). During the implementation phase, community contribution was 14% of total project cost, which the community provided in the form of local materials and all the unskilled labour required for the construction of the system. Besides, the community has to pay 80 percent of the financial cost taken as loan from the revolving fund created by Lumanti and Butwal municipality. In this sense, the community has a greater contribution.

The stakeholders of the water supply system have determined that each household has to pay NRs.65 per month in order to pay the loan and operate and maintain the system. In particular, NRs.60 was allocated for the payment of the loan, whereas NRs.5 was fixed as the resources required for the operation and maintenance. This amount was determined based on the amount of loan that was to be paid, the amount of resources required for the operation and maintenance and willingness to pay of the community members. While the determination of a flat rate was simple to implement, it overlooked the principle of equity and ability to pay principle.

##### **4.7.6.2 Khairnitar Small Town Water Supply and Sanitation Project**

The Government of Nepal with the financial assistance of the Asian Development Bank implemented Small Town Water Supply and Sanitation Sector Project (STWSSSP) for the period of 2001-2006 in about 30 towns

of Nepal. Khairenitar is one of them. The project adopted a community managed demand responsive approach with the involvement of community in the formulation and implementation of the project. This project aims to improve the health and quality of life of the people living in small towns through the construction or rehabilitation of water supply systems, drainage and sanitation facilities and the implementation of Public Awareness Campaign and Health and Hygiene Education programs.

Four institutions played important roles in the implementation of the project. STWSSSP-Government of Nepal, Town Development Fund, Khairenitar Village Development Committee and Khairenitar Water Users and Sanitation Committee signed the first accord to improve the water supply and sanitation system of Khairenitar in 2002.

The total cost of the water supply project was NRs.20.3 million (US\$290,351)<sup>7</sup> with 5% contingencies and 10% tax. The main contributor was the GON, which provided 50% of the capital cost for water supply component. The second major input (30%) was a loan from the TDF that community has to return within 15 years with an interest rate of 8%. One percent of the interest rate is retained by the WSSUC for subsidising ultra poor communities in the project area.

**Table 4-5: Khairenitar Small Town Water Supply and Sanitation Project: Cost Sharing Arrangements**

Stakeholder	Type Of Contribution	Contribution (NRs/US\$)	Percentage
Government of Nepal	Grant	Rs.10,162,294 \$. 145,176	50
Town Development Fund	Loan	Rs.6,097,376.40 \$. 87,105.4	30
Community	Upfront Cash Contribution	Rs.1,016,299.40 \$. 14,518.6	5
Community	Kind or Cash Contribution	Rs.3,048,688.20 \$. 43,552.7	15
TOTAL		Rs.20,324,588 \$. 290,351	100

Source: Engineering Design Report, Integrated Consultants Nepal and Consolidated Management Services Nepal, 2004

Apart from the repayment of loan, community also contributed 5% up-front cash before the implementation of the project and another 15% either with cash or labour during the implementation of the project (see Table 4-5). In total, community contributed 50 percent of the total project cost. The average contribution per household was estimated at NRs.7,817 (US\$112).

<sup>7</sup> Exchange rate applied 1US\$=NRs.70

# Chapter 5

## COMMUNITY BASED LOW-COST WSS TECHNOLOGIES

### 5.1 Introduction

The applicability of available low-cost community based technologies depends on hydro-geological, socio-economic and cultural condition of a region. Selection of proper technology in accordance with the contextual variation is a significant factor to ensure the sustainability of the WSS system. No single option can serve the people having diverse socio-economic background. Experience suggests that urban communities are more interested in low-cost technologies. The implemented technology should, if possible, be in harmony with the socio-economic conditions and above all with the willingness of the users to pay. In many cases the poor urban community choose hardware for water points and sanitary latrines from a number of alternative options suggested by the implementing NGOs according to their affordability, convenience and requirement (Baganbari, Ta Block) It should be mentioned here that the high-cost WSS technologies do not deliver additional health benefits over a properly installed low-cost options; it may provide more convenience.

### 5.2 Different Community Based Water Supply Options

There are many technologies available for water supply. However all these technologies do not function uniformly everywhere and hence are not appropriate universally. All these are dependent. In small geographic unit or in a community a number of technologies may be feasible among the whole range of technologies. Broadly they may be classified as groundwater based and surface water based, rainwater based and other types.

A brief overview of some important technology options mostly available in the urban slum areas of our case studies are described in this section:

### 5.2.1 Tubewell Technology

These technological options are used all over the world to extract groundwater. The soil stratum which bears groundwater is called aquifer. The type of tubewell technology that will be implemented depends on the depth and characteristics of the aquifer in that location.

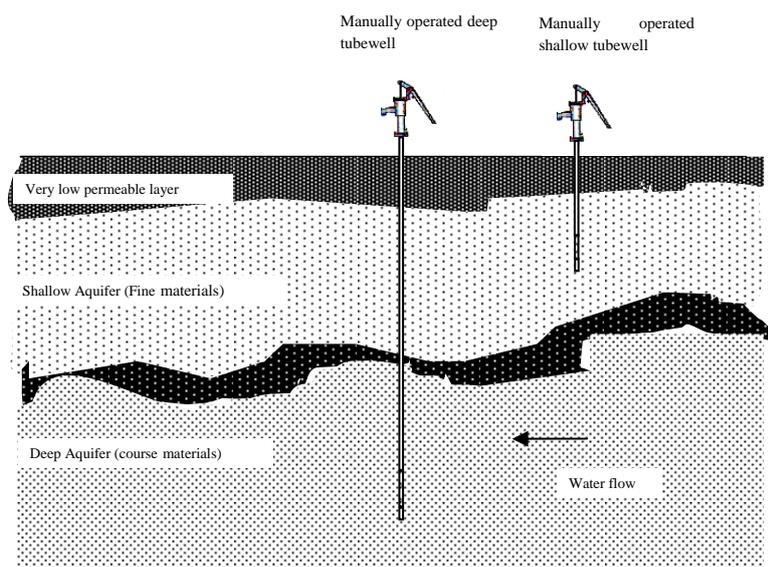


Figure 5-1: The main aquifers and well for water supply

The tubewells designed and developed may be grouped in three categories:

- ⊙ Shallow tubewells
- ⊙ Deep-set intermediate technology and
- ⊙ Deep tube wells

#### 5.2.1.1 Shallow Tubewells

In shallow tubewell technology, handpumps are operated in suction mode. Suction pumps draw water from shallow aquifer. It can particularly extract water from up to a depth of 7.5 m of static water level. (Ref: Ahmed, M.F and Jahan, H.)

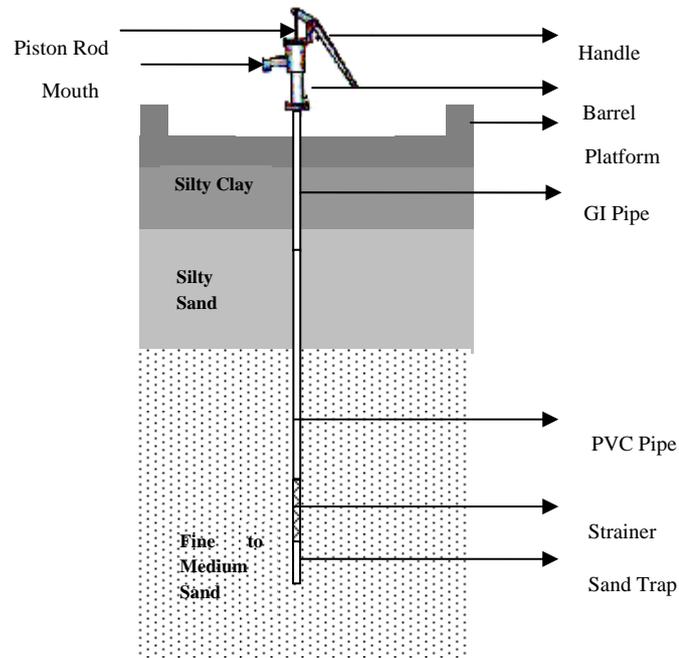
##### **No. 6 Handpump Tubewell:**

This is the most common and popular shallow tubewell technology used in Bangladesh. The name of the Tubewell is based on the barrel diameter in inches.

**Components:** The general components of a No. 6 Handpump Tubewell are hand pump, blind pipe, strainer (screen) and sand trap.

**Handpump:** The components of a No. 6 handpump are base, barrel, head cover, handle, piston rod, plunger, valve weight, bolts and nuts. The bucket and seat valve are made of leather or PVC

**Blind Pipe:** It is used between screen and handpump. Different sizes of pipe can be used but 38 mm diameter pipes are most common.



**Figure 5-2: No. 6 hand pump Tube well**

**Strainer:** It is the perforated portion of a well through which groundwater enters into the well from the aquifer. Usually 38 mm dia. PVC strainer is used mostly.

**Sand Trap:** It is the extension of a blank pipe fixed at the bottom of the filter. The open end of the pipe is sealed with a cap. Generally PVC sand trap is used. The sand trap accommodated the incoming fine sand which ultimately settles at the bottom of the well.

**Working Principle:** A vacuum is created within the cylinder of the pump by raising the piston and water enters into the cylinder to fill up the vacuum. In the second stroke when the piston is lowered down, the water enters in the upper chamber and comes out through the spout when the piston is again raised to create vacuum.

**Table 5-1: Advantages and disadvantages of No. 6 Handpump**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ Suitable for low water table zone;</li> <li>◆ The spare are available in the local market;</li> <li>◆ Easy to operate.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Many tubewells produce water with high arsenic content;</li> <li>◆ Water generally hard, use for bathing and cooking is restricted by different complaints.</li> </ul>

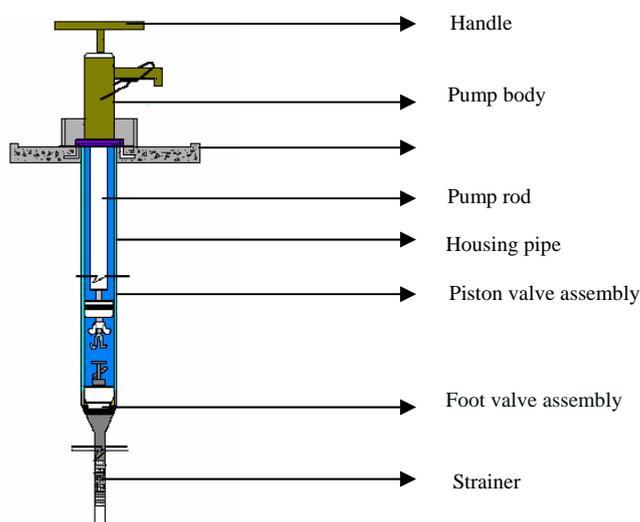
### 5.2.1.2 Deep-set Intermediate Technology

The low water table area is increasing with the increase in the use of ground water for various purposes. Water can be abstracted from a depth beyond suction limit using deep-set intermediate technology. Deep-set pumps can abstract water up to 30 m below static water level depending on the advancement of hand pumps. Tara Handpump is the most common deep-set technology used many parts of Bangladesh

#### **Tara Handpump Tubewell (Hazighona, Sitakundo, Bangladesh):**

It has been developed in Bangladesh by Unicef and UNDP-World bank Programme to pump water from up to 15 m below the ground surface(Ref: Ahmed, M.F. and Rahman, M.M.) The main components are shown in the figure below:

**Components:** The main components of Tara handpump tubewell are: pump head, handle, pump rod, piston assembly, foot valve assembly and cylinder. The lower well casing, strainer and sand trap are as usual of No. 6 handpump.



**Figure 5-3: Tara hand pump**

A Tara tubewell is installed within 75 mm dia casing in which a 50 mm dia cylinder and rising main set. The lower well casing is made of 38 mm diameter PVC pipe and is attached with the filter or well screen. The filter or well screen is 38mm dia slotted and internally ribbed PVC pipe. A 32 mm dia. PVC pipe is used as pump rod to operate the piston. (Ref: Ahmed, M.F and Jahan, H.)

Sand trap closed with an end-cap is attached at the end of the well and allows the sand coming with water to accumulate without clogging the screen. All the components of Tara pump except pump head and handle are made of PVC. The life of a Tara pump is expected to be 3-5 years. Maintenance requires no additional tools. (Ref: Ahmed, M.F and Jahan, H.)

**Table 5-2: Advantages and disadvantages of Tara Handpump**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ Suitable for low water table zone to a depth of 15 m of static water level.</li> </ul>	<ul style="list-style-type: none"> <li>◆ More pressure is required; (Hazighona, Bangladesh)</li> <li>◆ Buoyancy force is not always available due to leakage in pump rod;</li> <li>◆ Provide moderate output up to 7m lift and very low output at 12 m lift;</li> <li>◆ Repairing/replacement of parts is inconvenient;</li> </ul>

### 5.2.1.3 Manually Operated Deep Tubewell

Usually a tubewell installed to withdraw water from a deep aquifer is called deep tubewell. From the engineering view point, a tubewell penetrating at least one impermeable layer is known as deep tubewell (Ref: Figure 1). It operates under suction mode exactly in the same principal as a shallow tubewell.

Deep boreholes are required for installation of deep tubewells and mechanical devices are necessary for construction its construction. Around 20 HHs in the community could be served using a DTW however it varies with the guidelines set by the different implementing NGOs. (Sitakundo, Bangladesh). In some areas it takes legal permission from the concerned authority for the installation of DTW. (Hazighona, Bangladesh; pg 11)

**Table 5-3: Advantages and disadvantages of Deep-set Tubewell**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ Deep-set Tubewells are installed usually in saline areas to extract water from fresh aquifers</li> </ul>	<ul style="list-style-type: none"> <li>◆ Mechanical devices are required to install;</li> <li>◆ Installation cost higher.</li> </ul>

### 5.2.2 Rain Water Harvesting System

RWH an old technology is gaining popularity in a new way (Old Zimkhana, Sitakundo, Bangladesh). This technology is used for domestic, agricultural, run off control, air-conditioning etc. in different parts of the world. In views of the challenges facing in the WSS sector regarding salinity of groundwater in coastal areas, arsenic contamination and absence of good groundwater aquifers in hilly areas as well as difficulties in tubewell construction in stony layers RWH is an opportunity which needs to be grasped urgently.

#### Elements of RWH

**Catchments:** The catchments of rainwater are usually the roof, which is connected with a gutter system to lead rainwater to storage tank. Roofs should be smooth since it is likely to catch and hold windblown dust and debris. It is preferable for a roof to be galvanized material. Lead proof and asbestos cement sheeting should be avoided because of health concerns. The quantity of rainwater that can be collected through roof catchment will largely determined by the effective area of roof and local rainfall.

**Gutter and down pipe system:** Gutter and down pipe are collecting and conveying systems. Gutter is fixed with roof catchment in a gentle slope and connected to the down pipe that ends up with the inlet of storage tank. This connection can be made from locally available materials like bamboo and wood. However, GI and PVC provide better result.

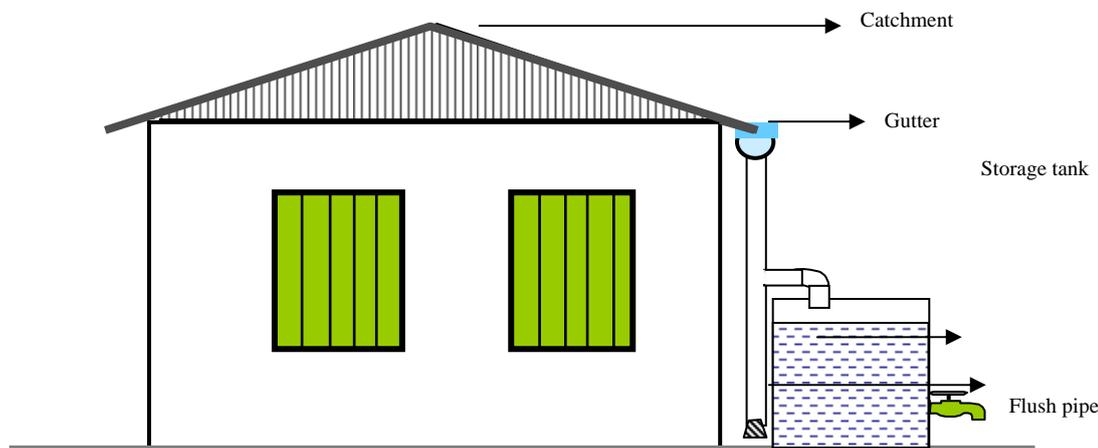


Figure 5-4: Diagram of a Typical RWHS

**Flushing System:** During periods of no rain dust, bird droppings and dead plant matter will accumulate on the roof. These materials are washed off with the first rain and contaminate the water in the tank. Contamination can be avoided the first 10-20 litres of rain.

**Storage Tank:** It is the most important component of the RWHS. Safe storage of rain water is the main objective of the storage tank. The size of the storage depends on demand, amount and distribution of rainfall, catchment area and type. Two kinds of storage tank are available. One is on ground and another is underground reservoir. Variety of materials has been used for construction of rainwater on ground storage tanks. These are mainly: fibrocement tank, bamboo reinforced ferrocement tank, earthen molded ferrocement tanks, cement mortar jars, brick tanks, plastic vessels etc.



Figure 5-5: Practice of RWHS in Stakundo, Chittagong, Bangladesh

**Table 5-4: Advantages and disadvantages of rainwater collection system**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ The quality of rainwater is comparatively good;</li> <li>◆ The system is independent and therefore suitable for scattered settlements;</li> <li>◆ Local materials and craftsmanship can be used in construction;</li> <li>◆ No energy cost is incurred in running the system</li> <li>◆ The system is located very close to consumption point.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Water availability is limited by the rainfall intensity and available roof area</li> <li>◆ Mineral free rainwater taste flat and may cause nutrient deficiency</li> <li>◆ Poorer section of people may not have suitable roof as catchment.</li> <li>◆ High level of maintenance required.</li> </ul>

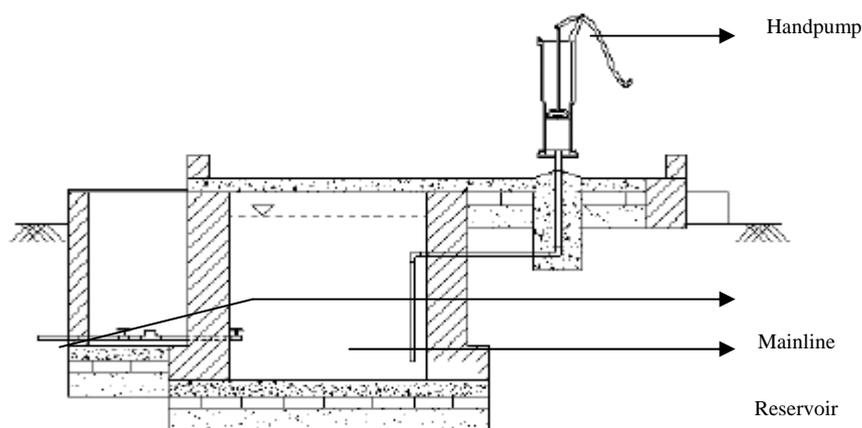
### 5.2.3 Urban Water Point

Water points are applicable for urban areas where centrally managed water supply systems exist. (Ref: Jurain, Bangladesh, pg 10 Technological Option) Water points are set up with an underground/over ground reservoir connected to local water supply authority main lines; hand pump leads are mounted on the top of the reservoir, so that water could be extracted via mechanical pressure. There is a platform above or around the reservoir for water collection.

Reservoirs are generally made of brick having strong plastering are in practice. But Ferro cement reservoir is recommended, where possible, for the following reasons:

- ⊙ Less risk of contamination
- ⊙ Reduced cost comparing brick made reservoir.

It should be ensured that the UWP is at a safe distance from any source of fecal pollution and the reservoir should be constructed above the highest flood level of the area.

**Figure 5-6: Urban Water Point with Reservoir**

(Ref: Implementation Guidelines for Urban Water Point/Stand Post February 2007, [www.wateraid.org/Bangladesh](http://www.wateraid.org/Bangladesh))

Depending on the size of the population and area of the slum the number of UWP established in a locality could vary. Experience suggests that tentatively 40-60 HHs could be served using each of these options (*Jurain, Bangladesh*). As the slum areas are not legally recognized the implementing agency play an advocacy role with the water supply authority to provide legal connection in the slum areas. A MoU is signed between the utility agency and the implementing NGOs in this regard (*Baganbari, Bangladesh pg 13*). The NGOs on behalf of the community take the responsibility to pay the water tariff. However the community has to reimburse it for the consumed water in accordance with the existing mechanism. (*Baganbari, Bangladesh*)

#### 5.2.4 Urban Stand Post

Stand post are directly connected to local water supply authority main lines; tap is connected with the mains through 1 in. dia service pipe, so that water could be extracted through gravity or mechanical pressure. There is a platform with the tap stand for water collection, washing and bathing. This option is also applicable for urban areas where centrally managed water supply system available. The system can serve around 15 HHs (*Jurain, Bangladesh*) in a community and the financial mechanism for this option is similar to UTW.

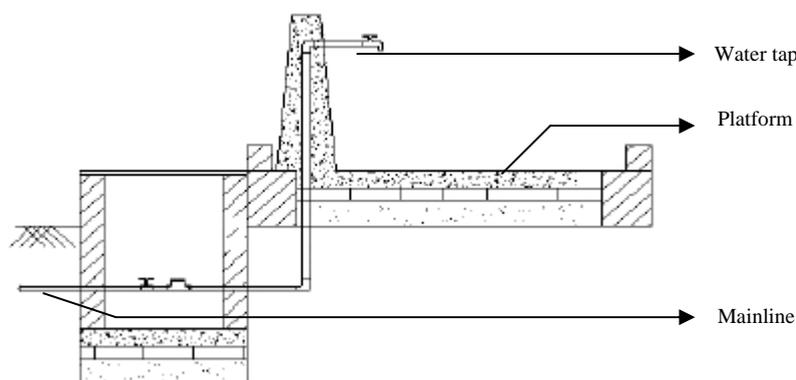


Figure 5-7: Urban Stand Post

(Ref: Implementation Guidelines for Urban Water Point/Stand Post, February 2007  
[www.wateraid.org/Bangladesh](http://www.wateraid.org/Bangladesh))

#### 5.2.5 Community Based Gravity Fed Water Supply System

A typical gravity flow system consists of a source, either a spring or a stream from which water is collected and stored in reservoir. In most cases the source is located far away from the project area. Sometimes before storage, water is treated using low-cost water treatment units which are generally installed at the reservoir side. The various steps of water treatment include filtration, disinfection etc. (*Khairnitar, Nepal*) Often water sample is analyzed for different parameters which are considered significant in that region (*Khairnitar, Nepal*). Linked to each reservoir tank there are a number of tap stands. Because the source and reservoir tanks are located above the water points, gravity causes the water to travel through the system.

In order to distribute equal amount of water to all the HHs of the community, the flow is often adjusted in accordance with the size of the family. (*Shreenagar, Nepal, pg 14*)

The system is considered simple and cost effective. It also provides water of comparatively good quality (*Dandatole, Nepal*). The water supply service in winter and rainy season is of 24 hours however it reduces few hours in dry season. (*Shreenagar, Nepal*)



Community tap stands



Reservoir of the gravity flow system

**Figure 5-8: Gravity Fed Water Supply System (Shreenagar, Nepal)**

Apart from the above technology there are several other community based low-cost water supply options which have been used in Nepal over the year; it includes:

#### 5.2.5.1 Water supply through private & community taps using DTW

In certain parts of urban slums of Nepal water is supplied from deep tube wells to few selected areas through a system of public or community taps (*Damak, Mahendranagar from Nepal*).

The system extracts ground water from tube wells. Water is lifted to the overhead reservoir using submersible pumps which is driven by electricity. As a precautionary measure a generator along with diesel tank is installed to get supply during the short electricity supply (*Damak, Nepal*). Following water is then distributed to the taps of the system. Sometimes to improve the quality of water extracted from the DTW filtration unit is used or chemical is applied in the reservoir tank.



(a)



(b)



(c)

**Figure 5-9: Community Based Water Supply using DTW through Taps**  
 (a) General view of one of the deep tube wells; (b) General view of the treatment unit; (c) General view of the reservoir tank

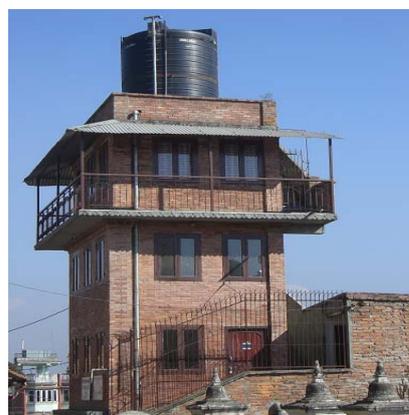
### 5.2.5.2 Community managed water supply through taps from stone spouts

In some specific areas (*Alok Hiti, Nepal*) the community has utilized the flowing water of stone spout to HHs through distribution network of pipelines by their own initiative. Water is first stored in a tank and then pumped to overhead reservoir. Water pumping and distribution carried out simultaneously to ensure continuous supply of water.

Water is distributed to the HHs through several distribution points which are installed in the major junction of the streets. At the junction the distribution points are built in a box for safety. At the time of distribution, HHs needs to connect pipe at own cost to these points. The distribution of water varies according to the distance from the main reservoir tank. HHs located at a long distance from the reservoir at low water pressure get water for a longer period of time.



(a)



(b)

**Figure 5-10: Community Managed Water Supply from Stone Spout (Alok Hiti, Nepal)**  
**(a) Women fetching water in Aalok Hiti stone spout (b) Reserve tank on the top of the users committee building**

## 5.3 Different Community Based Sanitation Systems

A sanitation system involves all arrangements necessary to store, collect, process and delivers human wastes or other forms of wastes back to nature in a safe manner. There exists a wide range of alternative sanitation technologies that are low-cost, easily maintainable and can be selected to suit different hydro-geological, socio-economic and cultural conditions.

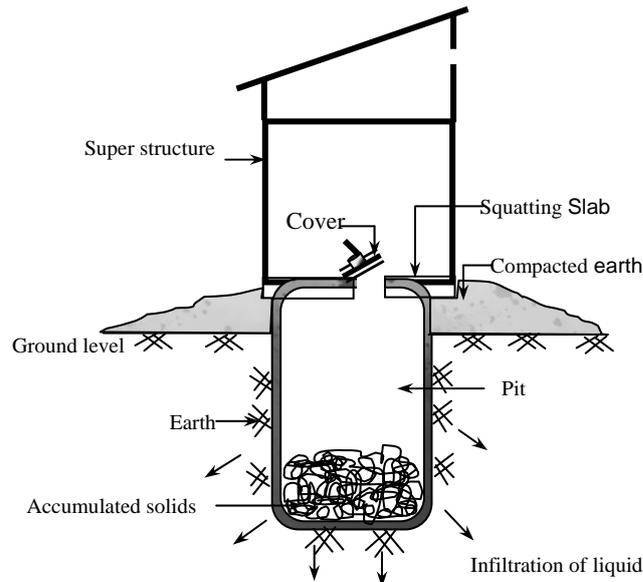
The following sanitation (latrine) options for human excreta management are usually offered –

- ⊙ Pit Latrine;
- ⊙ Pour-flush
- ⊙ Communal Sanitation System
  - ◇ Cluster Latrine,
  - ◇ Sanitation Block.

Ecological Sanitation is another form of environmental friendly technology which has recently been introduced in some parts of Nepal (*Khokna, Nepal*). A brief overview of some important technology options is given below:

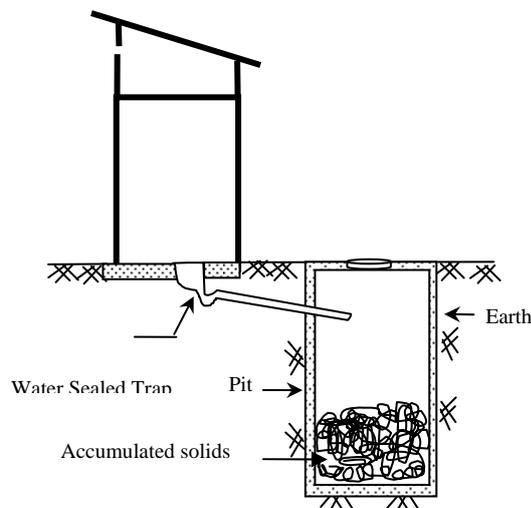
### 5.3.1 Pit Latrine

Pit latrine (*All Case Studies*) may not be an appropriate technology for defecation but it is the cheapest, simple and also universally accepted option. A pit is simply a hole in the ground into which excreta falls. Urine and other liquids soak into the ground and solid materials are retained and decomposed in the pit.



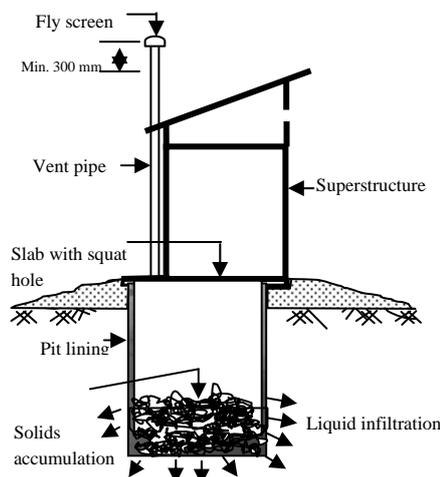
**Figure 5-11: Simple/Direct Pit latrine**

When excreta fall directly into the pit underneath the user, it is called direct pit latrine. When excreta pass through a short pipe to a pit a few meters away then it is called offset pit.



**Figure 5-12: Off Set Pit latrine**

Various modifications of pit latrines are available to improve its design for safer use, depending on local conditions and customs. The improvement include the use of dry stonewall to minimize leaching. (*Shreenagar, Nepal*).The main problem associated with the simple pit latrine, i.e. fly and mosquito nuisance and unpleasant odor are effectively minimized by the action of vent pipe. This improved technology to overcome the disadvantages of simple pit latrines is known as *Ventilated Improved Pit Latrines (VIP)* (*Ref : Sreepur, Bangladesh*).



**Figure 5-13: Ventilated Improved Pit Latrines (VIP)**

1-3 HHs may use one single pit latrines and the members of the HHs are responsible for the operation and maintenance of the hardware. There is no separate water system inside the chamber; usually users keep a big jar with full of water inside the latrine and separate mug for using water. A twin pit latrine can be used by 3-5 HHs (*Hazighona, Bangladesh, Art 6*).However it often varies with the guidelines of the implementing NGOs. (*Sitakundo, Bangladesh pg 12*)

### **General design Considerations**

- ⊙ Pits can be square, rectangular, circular; commonly 1.0 to 1.5 m in diameter. For larger pits, cover slab becomes expensive
- ⊙ Soils with low permeability are unsuitable for pit latrines
- ⊙ Lining should be provided for pits constructed in unstable soil.
- ⊙ A distance of at least 10 m should be allowed between pit and a source of drinking water(*Ref: Ahmed, M.F. and Rahman, M.M.*)
- ⊙ There should be provision for adequate ventilation of the superstructure

### **Design of Pit Latrine**

**Effective Pit Volume (V):**

$$V = C \times P \times N$$

V= effective volume of pit in m<sup>3</sup>

C=Solid accumulation rate (m<sup>3</sup>/person/yr)

P=Number of users

$N$ =Design life (years)

Design Solids Accumulation Rate (C):

Wet pit: 0.04 m<sup>3</sup>/person/yr

Dry pit: 0.06 m<sup>3</sup>/person/yr

### **Emptying of Pits**

When the contents of the pit reach the level of 0.5 m below the slab, there are two options:

- ⊙ Construction of a new pit on an adjacent site, or
- ⊙ Emptying the existing pit.

Manual emptying involves serious health hazard. Mechanical emptying is easier if the pit contents are wet. Often the community people avoid using latrines as they remain concerned that they have to replace the pit if it is full which involves further expenses. (*Shreeagar, Nepal, Pg 10*) So, the community should be informed about the emptying process to ensure sustainability of the system.

**Table 5-5: Advantages and disadvantages of Pour-Flush Sanitation technologies**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ Less expensive;</li> <li>◆ Prevents hookworm transmission;</li> <li>◆ Easy construction and maintenance.</li> <li>◆ Structurally safe and therefore less chance of children falling into it;</li> <li>◆ Better solution than open defecation.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Improper lining of pit may lead to collapse of structure;</li> <li>◆ Unpleasant odor or increase in fly population if ventilation is not provided.</li> </ul>

### **5.3.2 Pour-flash Sanitation Technologies**

It is a further improvement to the simple pit latrines it offers better odor insect control through water-seal (*Ref: Sirajgonj, Sreepur from Bangladesh*) which is the most vital part of it incorporated between squatting plate and the pit.

#### ***The Water Seal (Sreepur(pg 10), Sitakundo (pg 9) Bangladesh)***

It is the Key component. After each use of the toilet, about 2 to 3 liters of water is poured in to flush the excreta. Some of the clean flush water remains in the trap thus maintaining the water seal. A very important matter is the depth of the water seal within the trap unit. A seal depth of 15 to 25 mm should be optimum.

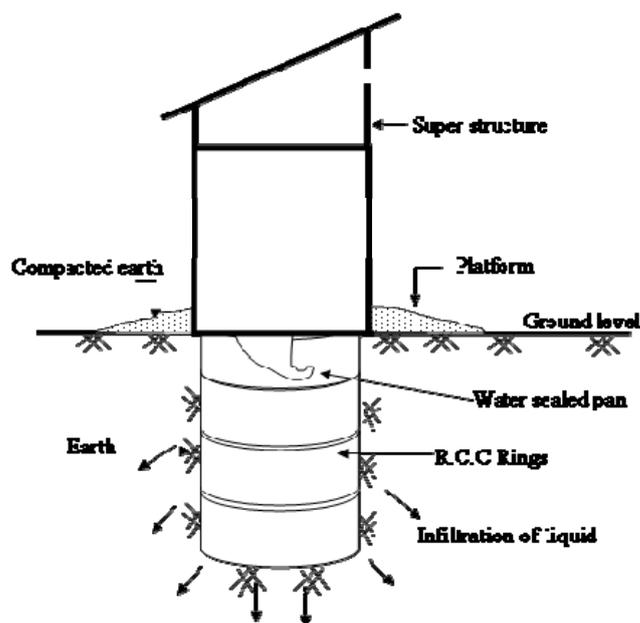


Figure 5-14: Pour Flush Latrine

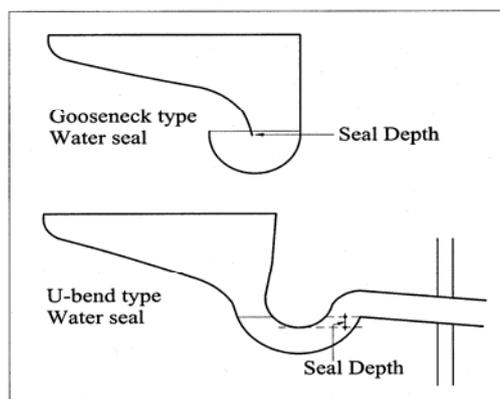


Figure 5-15: Water Seal

When the pit is directly below the latrine, a simple water seal, called a “gooseneck” trap can be used. Problems associated with gooseneck traps include:

- ⊙ Traps accidentally broken when made of cement concrete or earthenware
- ⊙ Not used for long period of time due to lack of flushing water
- ⊙ Traps have been intentionally broken to make the pan easier to clean and avoid blockage.

The pour-flush latrines are of two basic types:

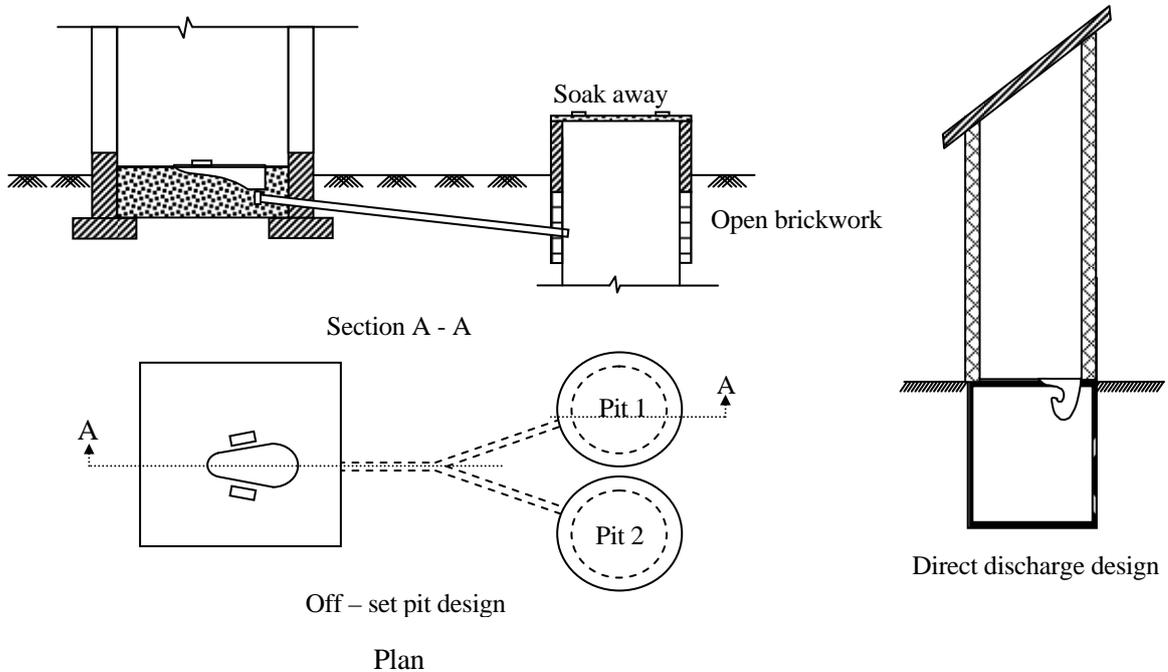
- ⊙ Direct pit
- ⊙ Off-set pit

**Direct Pit (Sreepur, Bangladesh):**

Squatting plate is provided with a 25 mm water seal and is placed directly over the pit. (Ref: Ahmed, M.F. and Rahman, M.M.)

**Off-set Pit (Sreepur, Bangladesh):**

It is connected to the pour-flush with a 100mm dia. pipe. (Ref: Ahmed, M.F. and Rahman, M.M.)



**Figure 5-16: Pour Flush latrines**

**Alternating twin offset pit pour-flush latrine: (Hazighona, Sirajgonj from Bangladesh)**

In this case the pit are used alternately and at any given time only one pit is used. When the pit is full, the flow of excreta is directed to the second pit through Y-junction (Fig c) and the content of the first pit is left to decompose.

**Table 5-6: Advantages and disadvantages of Pour-Flush Sanitation technologies**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ Less expensive;</li> <li>◆ Eliminate odor, insects and fly breeding;</li> <li>◆ Can be located inside house;</li> <li>◆ Safe for children;</li> <li>◆ Easy construction and maintenance.</li> <li>◆ User can share the total cost.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Separate sullage disposal facilities required;</li> <li>◆ Water seal may be clogged if garbage thrown into it;</li> <li>◆ Water must be available throughout.</li> </ul>

### 5.3.3 Communal Sanitation System

A communal sanitation system consists of a number of squalling facilities with a common disposal system. It may either consist of toilet facilities only (*Cluster Latrine*) or a combination of toilet, shower and laundry facilities (Sanitation Block). It is built outside the household plot in communities and used by people for their daily needs.

#### **Cluster Latrine** (Baganbari, Bakalia from Bangladesh)

Cluster Latrine (CL) is a community managed technology consists of more than one latrine chamber within a same boundary. This technology is applicable where water source is available close to the potential latrine facility in the community and also in the slum and fringes areas of many large cities and towns where the dwellers cannot afford individual sanitation facilities. A cluster latrine generally have 3-5 chambers depending on the size of population in the community. It has separate chambers for men and women. A 5 chamber cluster latrine could be used by around 30 HHs (*Bakalia, Bangladesh pg 12*). However it depends sometimes on the guidelines set by the implementing NGOs.

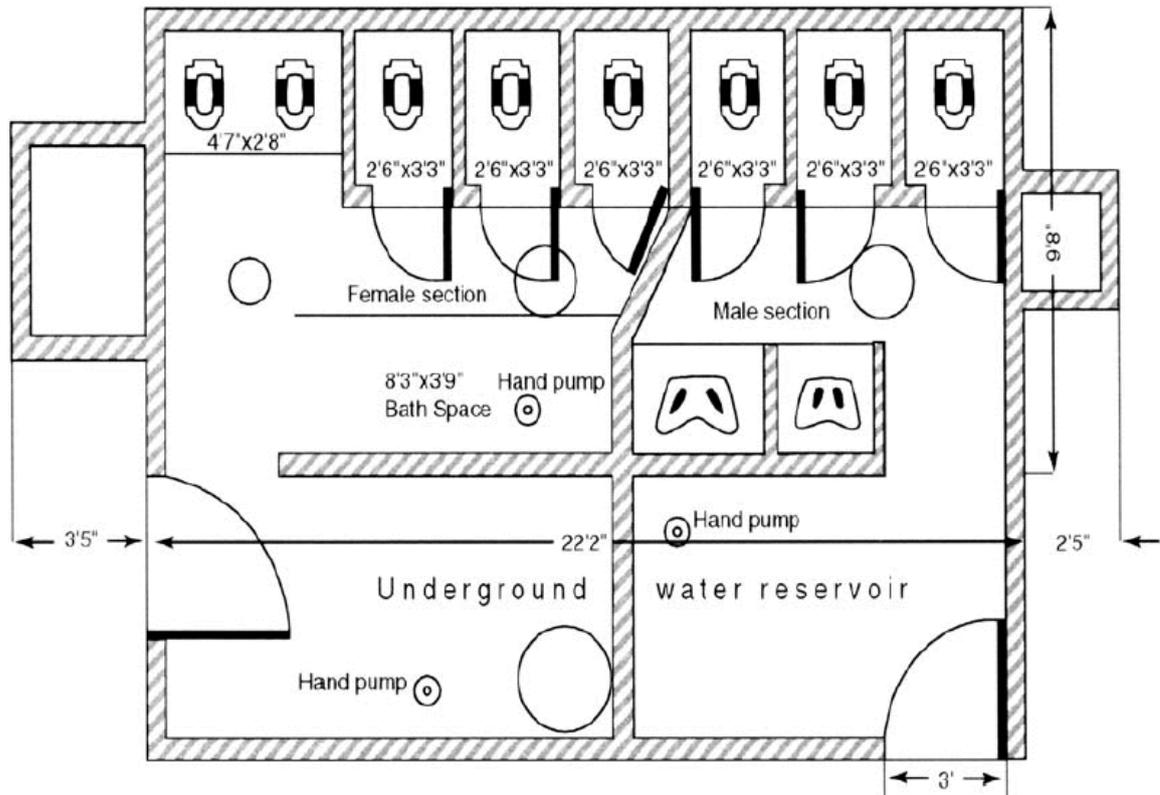
A series of pans are attached with two or three pits. Each pit consists of five to eight rings. The cluster latrines can be of a manually flushed type (e.g., pour flushed toilets) or low volume cistern flush type toilets. There is no separate water supply system inside the cluster (*Bakalia, Bangladesh pg 12*) Cluster latrine facilities should be provided with a piped or tube well water supply sufficient for flushing, anal cleansing, hand washing.

Though cluster latrine with septic tank is more costly option compared to cluster latrine with pits, but this is safer and durable option. Septic tank is advised if the site is situated in low-lying areas, nearer to the water bodies or at shallow water table areas.

#### **Sanitation Blocks**

Basically there is no technological difference between the cluster latrine and the sanitation blocks except the fact that it has water supply options inside for washing hands after defecation and bathing. The figure depicts typical diagram of a sanitation block. Male, female and children generally have different section inside a sanitation block (*Old Zimkhana, Bangladesh*)

Sanitation blocks several chambers of latrines and urinals linked to septic tank (*Old Zimkhana, Bangladesh*). Those are managed by the community same way as the water point.



**Figure 5-17: Plan of a Sanitation Block**

(Ref: *Environment and Urbanization*; [eau.sagepub.com](http://eau.sagepub.com))

#### **Septic Tank System** (*Khokna, Nepal pg 4*):

A septic tank is a buried water tight receptacle designed and constructed to receive wastewater from household/community latrine/sanitation blocks, to separate solids from liquid, to provide digestion of organic matter, to store solids and to allow the clarified liquid to discharge for further treatment and disposal. Settleable solids and partially decomposed sludge settle to the bottom of the tank and gradually build up. A scum of light-weight material including fats and greases rises to the top. The partially treated effluent is allowed to flow through an outlet structure just below the floating scum layer. This partially decomposed liquid can be disposed of through soil absorption systems, soil mounds, evaporation beds or anaerobic filters depending upon the site conditions. The essential components of a septic tank system are shown in Figure. Although there is an overall reduction in the number of micro-organisms, a large number of bacteria, viruses, protozoa and helminths survive the processes in the tank and remains active in the effluent, the sludge and the scum.

Septic tanks can be built for individual households and also for a community. However, for proper functioning, a community septic tank must ensure proper operation and maintenance through a participated community approach. Cost of septic tank varies depending on size and construction materials. The cost of a community septic tank may however, be prohibitive for low income communities particularly slums. Also a permanent structure like community septic tank may not be preferred in slums that are subjected to evictions. It also remains to be seen whether a community septic tank would be appropriate for a slum hanging on water bodies.

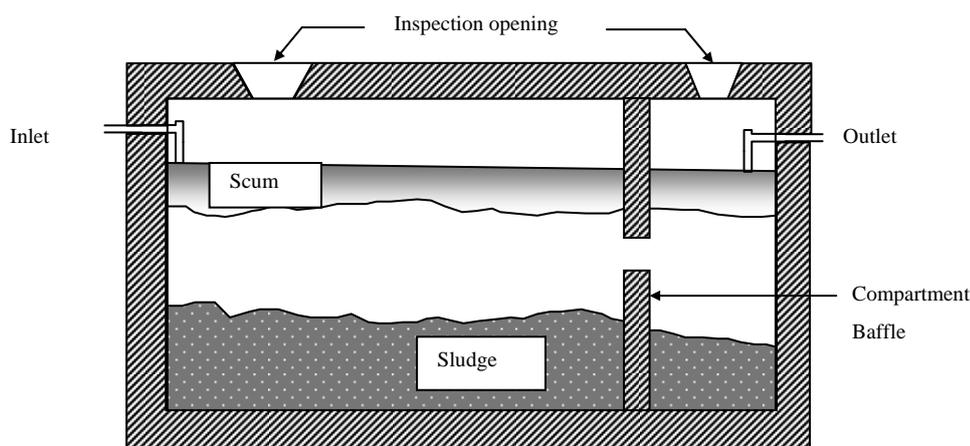


Figure 5-18: Various components of a septic tank

Table 5-7: Advantages and disadvantages of Communal Sanitation

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>◆ Suitable for urban slums where other technologies not feasible due to space constraint;</li> <li>◆ User can share the total cost.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Lack of commitment of individual to keep the option clean;</li> <li>◆ Lack of privacy particularly for women;</li> <li>◆ Difficult to use at night or in bad weather especially for children.</li> </ul>

**Ecological Sanitation (Khokna, Nepal):** Ecosan, although apparently a new concept, has, in fact, recently been introduced in certain parts of Nepal. (Case Study 4, Khokna, Nepal) This is a low-cost eco-friendly sanitation technology specially suitable for the farmers. It has urine separating system that enables separate storage of urine and faeces and minimizes use of water required for toilet.



(a) General Overview



(b) Different Compartments

Figure 5-19: Ecological Sanitation (Khokna, Nepal)

The collected urine is retained for 15 days in the tank and then it can be applied in the field. Likewise, the feces are being collected in one vault and need about 5-6 months to dry up to be good compost. After filling the first vault a second vault is used for the same purpose.

Major benefits of ECOSAN latrine are as following:

- ⊙ Control of environmental pollution,
- ⊙ Save water from contamination while using septic tank or sewerage,
- ⊙ Make available free compost for farmers and save money, substitute imported chemical fertilizer and maintain quality of land, etc

## 5.4 Selection Criteria for WSS Technologies

Selection of WSS options in the urban areas depend on several important parameters. Among those the hydro-geological factor is a common consideration for both water supply and sanitation technologies. Affordable and user friendly technology promotes spontaneous participation of the poor urban community in cost sharing thus maximizing the access to the WSS services which are important components of sustainability. (Ref: *All Bangladesh Case Studies except in Sirajgonj from Bangladesh and Case studies of Nepal conducted in Khokna, Khadiphaka, Alok Hiti, Khairenitar, Dandatole*)

The implementing NGOs in most cases facilitate the community to select suitable WSS options. They demonstrate various options to the community and uphold its advantages and disadvantages. The community takes the decision in consultation with the implementing NGOs to choose the appropriate technology which will be affordable to them and feasible in the context of that area. (Ref: *Jurain, Old Zimkhana,, IG Gate, Sitakundo, Bakalia from Bangladesh*)

### 5.4.1 Selection criteria for Water supply options

Availability of water source, quality of water in a particular area and of course hydro-geological conditions are the significant factors to be considered for water supply technologies.

Hand pump tubewell needs to be installed at higher elevation, which is not usually flooded. Safe distance should be maintained between a tubewell and nearby latrine. If no guideline is available a distance of 10 m should be followed to avoid the risk of contamination. It is important to have an idea about the water quality of the selected area for tubewell installation especially if the region is vulnerable to any significant water quality parameter. (*Hazighona, Banladesh*) The tubewell should be installed in a place accessible to the users and the caretakers. No. 6 hand pump is considered to be low-cost option for portable drinking water in urban areas where piped water supply system not introduced.

Tara pump should be installed in a place near a tree, because dismantling, the long pipes of Tara needs to be leant against the tree. The user's acceptability and privacy, particularly for women and children should always be considered. Deep tubewell are mainly constructed in coastal belt to extract water from deep fresh water aquifers.

UWPs are applicable for urban areas where centrally managed water supply system exists. Stand post option should get priority over the water point when the water supply is continuous, there is sufficient water pressure at a height of 3m above the ground and comparatively less HHs are available to cover.

Rainwater Harvesting system can be applied in many locations in the world but it is of particular importance in countries with arid and semi arid lands, where it may often provide the only feasible solution. In the coastal belt, high salinity in surface and ground water and in the hilly areas, absence of good ground water aquifers as well as difficulties in tubewell construction in stony layers, RWHS could be a possible alternative source of water supply.

## **5.4.2 Selection Criteria for Sanitation Technologies**

### **5.4.2.1 Pit Latrine Technologies:**

This technology is suitable especially of low-density urban areas. However it is difficult to be more specific in general terms, as local factors such as HH size, housing design, plot layout and size have such a large influence. At a higher density alternating double pit latrine may be feasible. For construction of pit latrines the soil condition needs to be stable and permeable. Expansive clays are not suitable for this type of technology as liquid fraction of excreta unable to infiltrate the soil which leads to frequent changing of pits. Presence of rocks within 2m from the ground level also makes the boring of pit difficult. Water table has to be at a depth more than 1 m from the ground level to prevent its contamination.

### **5.4.2.2 Pour-Flush sanitation Technologies**

It may be used in the urban areas provided that they are appropriately designed and that they can rely on water availability for flushing and for maintaining water seal. Single pit may be available in the urban areas only if they can be desludged mechanically by a vacuum tanker, since their contents are not pathogen free. Twin pits are recommended if the pits are to be desludged manually, as the resting period ensure that the contents to be removed are substantially free of excreted pathogens.

### **5.4.2.3 Communal Sanitation System**

Communal sanitation facilities are provided where sewerage system are not feasible both technologically and economically and where on-site individual sanitation systems are not possible due to housing density in the urban slum areas and ground conditions.

## **5.5 Operation & Maintenance of Different WSS Technologies**

All the hardware has its durability and after certain period it need repairing and may be replacing some parts. The long term sustainability of the system depends very much on the adequate and effective O&M of the system.

### 5.5.1 Operation & Maintenance of Different Water Supply Options

O& M is essential to prevent contamination of water from the system itself to use and to ensure continuous and full fledged delivery with time. Different strategies for O& M and preventative measure are followed to ensure proper functioning of different water supply technologies.

#### 5.5.1.1 Tubewell Technologies

It is one of the common groundwater extracting technologies all over the world. Some of the main operational features of tubewell are given below:

- ⊙ The tubewell platform, attached drain and surrounding areas should be clean regularly;
- ⊙ Any crack on the platform should be repaired immediately as there could be ingestion of contaminated water through these cracks;
- ⊙ Tubewell components should be dismantled and reassembled after cleaning in every month;
- ⊙ Spilt water should be properly drained away from the platform;
- ⊙ Hand pump spout should be kept clean;
- ⊙ It should be ensured that pump foot valve is in proper condition.
- ⊙ Water quality should be tested regularly otherwise people may get reluctant to concentrate on O&M. (*Old Zimkhana, Bangladesh*)
- ⊙ For area of problematic water ( especially the presence of toxic chemical) low-cost treatment plant to overcome that water quality problem could be connected with the tube well. (*Sirajganj, Bangladesh*)

Proper hygiene practice should be ensured during collection & transportation of water. If possible the quality of water should be tested regularly considering the WQ parameter significant in context of the hydro-geological condition of that region.

#### 5.5.1.2 Urban Water Points (UWP)

Some of the important considerations while using UWP are:

- ⊙ The tubewell platform and surrounding areas should be clean regularly;
- ⊙ Any crack on the platform should be repaired immediately
- ⊙ Is the reservoir should be covered properly;
- ⊙ It need to be ensured that there is no leakage or crack in the pipe connecting the reservoir with the mainline or it does not pass through dirty water;
- ⊙ Any ponding at the connection point should be avoided.

#### 5.5.1.3 Rainwater Harvesting System

Proper operation of the system required to maintain sustained supply of rain water of good quality and adequate quantity. The some of the main operational features are given below:

- ⊙ The flushing system need to be operated properly. The wash water should be allowed to flow out until visible clear water is available;
- ⊙ Rainwater storage tank/container shall always kept covered to avoid contamination;
- ⊙ The area around the rainwater shall be kept clean and dry;

- ⊙ Rainwater delivery pipe should be closed properly to avoid wastage of water

User maintenance of catchment surface, gutter and storage tank is essential if the rainwater harvesting system is to be successful. Gutter and tanks must be cleaned frequently to prevent overflow during heavy rains. Another problem is consistently discharging the “first flush” system and the frequency of roof and gutter cleaning. Storage tank should be covered properly and screening should be provided on inlet and outlet holes. Sunlight reaching the water will promote algae grow. Unprotected openings will also encourage mosquito breeding. Sediment should be removed and wall should be scrubbed annually.

#### 5.5.1.4 Gravity Fed Water Supply System

Some of the important considerations during O&M of the system are:

- ⊙ There should not be any leakage between the source and the storage tank; if any it should be repaired immediately;
- ⊙ Any crack, damage or leakage in the storage tank should be repaired;
- ⊙ Water tank should be cleaned frequently to ensure safe water; (*Shreenagar, Nepal Art 5*)
- ⊙ All the vents and cover of the tank should be covered properly to prevent the ingestion of contaminants;
- ⊙ Any leakage should not be allowed in tap stand and pipes(*Shreenagar, Nepal*) ;
- ⊙ Water Quality testing at the source (*Khairnitar, Nepal*)
- ⊙ Fence could be used to protect the water source.( *Shreenagar, Nepal Art 5*)

#### 5.5.1.5 Involvement of Water Committee in O&M

Such committee is formed for each hardware among the beneficiaries of the water supply option among the community. The committee is involved in overall management and maintenance of each water point. They ensure the safety of the system and undertake repairing work when necessary. (*Ta Block (pg 4), Stakundo (pg 6), Bakulia (pg3) from Bangladesh*)

### 5.5.2 Operation & Maintenance of Different Sanitation Technologies

In general sense it includes maintaining cleanliness of the latrines and keeping the system in serviceable condition. Different approaches need to follow to ensure O&M of various sanitation systems which entails the following.

#### 5.5.2.1 Pit Latrines

Important operational aspects include the followings:

- ⊙ Regular cleaning of the squatting slab with some water and a little disinfectant if available.
- ⊙ A tight fitting lid should be placed on the squatting hole after every use to ensure insect and odour control. But in case of VIP latrines, the squat hole should never be covered to ensure continuous airflow; rather the door of superstructure should be kept closed for keeping inside dark.
- ⊙ Some water should always be available in or near the latrine for cleansing.
- ⊙ Ash or sawdust can be sprinkled occasionally in the pit to reduce smell and insect breeding.

- ⊙ Non-biodegradable material like stones, glass, plastics, rags etc. should not be thrown into the pit as they reduce the effective volume of the pit.

#### 5.5.2.2 Pour-Flush Sanitation Technology

Important operational aspects include the followings:

- ⊙ After each use, the pan is flushed with a few litres of water.
- ⊙ No solid material that could obstruct the trap should be thrown into the pan.
- ⊙ The floor and the squatting pan should be cleaned daily.
- ⊙ Wastewater from bathing and washings should not be drained into the pit.

Important maintenance aspects include the followings:

- ⊙ Squatting pan and the trap have to be checked regularly for cracks.
- ⊙ In case of twin leach pits, the diversion box should be checked for blockage and cleaned if necessary.
- ⊙ Single pits have to be abandoned and covered with 0.5 m soil when full, or emptied by mechanical means.
- ⊙ In twin pit system, the user should regularly monitor the level of contents of the pit.
- ⊙ If one pit is full, the other pit has to be emptied and made ready for use.
- ⊙ The pipe leading to the full pit must be sealed within the diversion box, and the flow diverted to the empty

#### 5.5.2.3 Communal Sanitation System

Important maintenance aspects include the followings:

- ⊙ Community should be motivated to keep the system clean while.
- ⊙ A full-time attendant for O&M
- ⊙ Appropriate fees may be charged for use of sanitation facilities and money thus collected may be used partially to pay the caretaker's salary and the rest may be utilized for maintenance.
- ⊙ Community contribution in O&M increases when community has to share a part of the capital cost. (*Case Studies*)

#### 5.5.2.4 Involvement of Sanitation Committee in O&M

The formation of such committee is similar to water point management committee. The sanitation committee is involved with in overall management of the sanitation blocks/cluster latrines in the community. They ensure regular and proper cleanliness of the system and undertake repairing whenever it is necessary. The committee also ensures the safety and security of the hardware.



# Chapter 6

## CONCLUSION

In Nepal and Bangladesh, government bodies lack capacity and sometimes also interest to deliver water and sanitation services to the urban poor. Poor areas do not appear attractive to private companies either. In this context, improvements of water supply and sanitation services in poor urban areas are mostly supported by foreign donors, which work in close cooperation with national and local agencies. The mainstream approach adopted by these agencies is based on community participation, as the central instrument to guarantee the provision of sustainable services to the poor. Thus, in both countries, in order to obtain an acceptable access to water and sanitation, the poor are progressively assuming major responsibilities in service provision.

### 6.1 Multiple Roles and Responsibilities of Community and Other Stakeholders

Donors (INGOs, international development banks or development agencies), national NGOs, local NGOs, government bodies, grassroots organizations and community based organizations, all work in cooperation to deliver water supply and sanitation services to communities in need of support. A wide range of partnership and bilateral relations are established between concerned agencies. As many stakeholders are involved in WSS interventions, a comprehensive cooperation pattern and clear division of responsibilities are both critical to obtain effective participation from all the involved institutions. For example, in Ilam (Nepal) and IG Gate (Bangladesh), lack of fluent communication between the government agencies involved in the project brought about negative impacts on the overall performance of the intervention.

Bilateral and multiple partnerships are established between donors, national and local agencies, and government institutions. Except for Alook Hiti scheme (Nepal), all projects revised in this book were sponsored by a foreign institution or donor. The nature of the donor involved in each intervention depends very much upon the scheme size and the targeted community. ADB is funding a large programme in Nepal, the “Small Town Water Supply and Sanitation Sector Programme”, which is being implemented in secondary towns of Nepal. Evidences from the field showed that some of the ultra poor households were not able to access the water supply and sanitation services offered by the programme due to their extreme poverty. Alternatively, INGOs such as Water Aid are funding programmes in very deprived areas, often squatter settlements, as seen in Khadipakha in Nepal or in many slum areas of Bangladesh. In view of these findings, it can be said that international development banks and development agencies are more likely to fund large projects which not necessarily reach the most vulnerable groups of society, while international NGOs are more likely to fund small projects specifically targeting the poor.

In large projects, the pertinent government department (DWSS in Nepal and DPHE in Bangladesh) usually assumes the main implementation role for hardware installation. In this type of projects, community involvement is also increasingly demanded. For example, Nepali policies stipulate that community must contribute at least 20% of the capital cost during the installation of a new water supply and sanitation scheme. However, it was noted that obtaining high community contribution during planning and implementation phases is not always feasible in urban areas because schemes are very costly and often require of skilled expertise and technical staff. In secondary towns of Nepal, community people are also gradually more engaged in operation and maintenance tasks, such in the ADB supported project, where the users committee assumes the overall management of the scheme. Role of community in the design, planning and implementation phases was more significant in small schemes. In Dandatole (Nepal), the users committee was actively involved in the planning and design of the system and was also responsible for managing the fund which resulted in a very efficient use of the available fund. The users committee could even incorporate some improvements in the scheme which were not considered in the initial budget.

Along with communities, national and/or local NGOs frequently act as main implementers in small projects. The NGO is meant to act as a facilitator and community is meant to become the manager of the scheme. In all the revised case studies, the intervention is initiated with an awareness campaign in order to create demand for the new services and change prevalent hygiene and health practices. The ignition phase was of utmost importance in Bashbaria (Bangladesh) and IG Gate slum (Bangladesh) where the facilitating agencies were adopting the popular Community Led Total Sanitation (CLTS) approach. In CLTS, communities are only provided with software support to achieve the common goal of total sanitation and therefore, a very high community involvement is expected.

In an attempt to channel effectively community efforts, community members are organized in users groups. Tasks to be accomplished by the users in one project area are often numerous and as a result, frequently several committees or groups are formed to distribute tasks efficiently within the community. In Bangabari (Bangladesh), besides the top committee, other committees such as the purchase committee, the construction committee and the water and sanitation management committees are created in order to enhance the management capacity of community. Interestingly, networking among users committees from different schemes was observed in two of the case studies. In Surkhet (Nepal) and Old Zimkhana (Bangladesh), a top institution was bringing together users committees from neighboring schemes. With this clever initiative, the individual committees could join efforts and gain strength and influence.

Community unity and inclusive participation of all sectors of community are perceived as essential components of any successful community-based intervention. In Dandatole (Nepal), diverging political preferences caused division among community people, which resulted in a weak performance of the users

committee and a very low water tariff collection rate. In squatter settlements of Bangladesh, the eviction threat is a major obstacle to involve community in development interventions. Slum dwellers resist to actively contribute to improve their water supply and sanitation situation, as they are fearful of wasting their investment in case of eviction. Consequently, the facilitating organization needs to make greater efforts to encourage slum dwellers to participate in the process. Strong leadership was also proved to be of great importance to promote unity of users and good performance of the users committee. However, occasionally strong leadership by certain sectors of community may hold back active participation of all community members.

Participation of women was found rather high in most case studies. Even though females were found not very active in some cases, in other cases, mainly in small communities, female representatives were majority and they were participating very actively. In fact, some committees incorporate provisions for the reservation of at least one third of the committee seats to female members. However, it is still usual to find that the top positions of the users committee are occupied by male representatives like in Baganbari (Bangladesh) or Alook Hiti (Nepal) case studies.

## 6.2 Financial Arrangements Favoring Effective Participation of the Poor

The poorest households usually suffer the most from the lack of adequate services and as a result, they are willing to pay more to obtain improved services. Thus, it is not strange to find that the poor pay more than better-off households to obtain acceptable access to water supply and sanitation services, e.g. buying water from vendors or financing a large portion of the capital cost. In poor urban areas, it is common to follow a capital cost sharing strategy, in which a fraction of the capital cost is contributed by community and the rest is contributed by the international development community or sometimes also the government. In the slum areas of Bangladesh, a capital cost sharing strategy based on the ability to pay of the users is particularly widespread. All households are classified in poverty categories to define which fraction of the capital cost they have to contribute. This modality has been proved especially effective to improve the ownership feeling of the beneficiaries towards the new hardware.

Among the 20 case studies revised, community contribution to cover the capital cost of a new water supply scheme ranged from no contribution in Dhulikhel (Nepal) to more than 87% in Alook Hiti scheme (Nepal). As to sanitation, community contribution to finance the construction of the latrine again varied enormously, from the fully subsidized latrines given in IG Gate Slum (Bangladesh) to the adoption of CLTS with 100% community contribution for latrine construction in Bashbaria (Bangladesh).

In addition to the capital cost contribution, regular expenses for operation and maintenance of the schemes are normally covered through the collection of a monthly tariff from users. Fixation of the monthly tariff is not an easy task, as normally there is a trade-off between the effectiveness of cost recovery and equity considerations. High monthly tariffs are far from the affordability of poor households and therefore, monthly tariffs can become a barrier for the very poor to access improved water supply. However, in general terms water tariffs were not found to be very elevated in those schemes managed by users committees. In fact, in Nepal, water tariffs were found to be reducing in real terms, which could bring about inefficiencies in the long run. Water tariffs should be increased at least as per inflation rate, although special provisions for the most vulnerable groups should also be incorporated.

Within the revised case studies numerous strategies to guarantee equality of access to drinking water and sanitation were identified. In Ilam (Nepal) the water supply system is managed by municipality who has incorporated several provisions to favour the inclusion of the very poor. A system of different connection rates has been defined using the type of house as an indicator of the socioeconomic status of the applicants and so that, the poorest households are exempt of paying the connection fee for a private connection. In addition, in Ilam the minimum tariff is set at a reduced price (NRs.25 per 8 m<sup>3</sup> of water); the rate per unit of water gradually increases per superior water consumptions. Municipality also makes available community taps with a moderate flat rate of NRs.25 for those households which cannot afford paying the monthly tariff of a private connection. Other case studies introduce the flexibility of contributing in kind, i.e. with labour or materials, to pay for the capital cost of the intervention, which favours the inclusion of the households with limited capacity to contribute in cash.

### 6.3 The Critical Role of Technology in Community Led Interventions

In community led interventions community people should be able select the technological option that better responds to their needs, always bearing in mind their affordability and the operation and maintenance requirements. As users are very often compelled to contribute part or even the whole capital cost of the intervention, community normally selects low cost technologies to satisfy their needs. In Nepal, it is very common to install gravity fed water supply systems that supply both private taps and community taps. Alook Hiti case study (Nepal) shows how community is capable to find very smart and inexpensive solutions to solve their water problems. The Alook Hiti system, which stores free flowing water from a traditional stone spout, is being replicated in other areas of the same town. Installing the same system in other stone spouts of Kathmandu Valley could potentially resolve the water scarcity scenario of thousands of households in the area. Alternatively, in the slum areas of Bangladesh, cluster latrines and community water points are mostly installed to face the lack of space and the limited affordability of the beneficiaries. Offering a wide range of technological options and extensively informing community about cost and main advantages and shortcomings ensures a decision making process fully led by community members.

Procurement and availability of materials is also a key issue of sustainable water supply and sanitation interventions. In Ilam (Nepal), the use of materials not available in the country to construct the system made repairs very costly and time-consuming which could compromise the well functioning of the system. That is to say that technological dependence with the donor may bring about very negative impacts and therefore, it should be avoided. Similarly, the use of good quality materials was seen to favour less break downs and therefore, the sustainability of the system in Damak (Nepal).

### 6.4 Ensuring Long Term Sustainability of Community Led Interventions

Learning from the past has demonstrated that communities are more likely to assume operation and maintenance responsibilities effectively, when their ownership feeling is properly developed. Accordingly, it is important to promote active involvement of community in all the stages of the project, i.e. in planning, development, implementation and post implementation phases. With the same purpose, beneficiaries are frequently asked to contribute part of the capital cost. One clear example of such arrangement is found in the slum areas of Bangladesh, where the main aim of the capital cost sharing strategy adopted by the facilitating agencies is to enhance ownership feeling rather than to decrease the cost of the intervention.

In all selected case studies, excepting Alook Hiti, the beneficiaries received significant assistance from the supporting organizations to develop the new scheme. One challenging task of any community led intervention is the effective empowerment of community to make it capable to run the system by itself. Many slums areas in Bangladesh do not have legal recognition and, consequently, they are not entitled to receive legal services from the national water supply company. In order to save such inconvenience, NGOs act as guarantors for the payment of monthly tariff. In Ghuntighar slum and Bangabari slum (Bangladesh) community is paying the monthly water tariff to the supporting NGO, who subsequently pays to DWASA, the national water authority. Hence, unless there is a change of current policy, community will always depend on the facilitating NGO.

In this way, registering the committee in the pertinent institution and formalizing the rights and duties of the committee in an approved statute or something comparable is critical to secure sustainable management and enhance the feeling of responsibility of the committees. Among others, the approval of comprehensive regulations favours the systematization of the renewal process and the periodicity of meeting/assembly celebration. However, field evidences showed that many users committees are running in an informal basis which poses a major risk to the well functioning of the institutions. This is particularly remarkable in the case of Bangladesh, where most committees cannot be legally registered due to the squatter nature of the urban settlements.

In order to ensure the sustainability of a community led intervention, it is also important to link Local Government Bodies (LGB) with the users committees, as LGB can conveniently support community in case of difficulties. However, LGB participation in water supply and sanitation interventions appeared to be often very limited, and sometimes even nonexistent. In Bangladesh, most agencies merely take approval from LGB prior to initiate construction of hardware in slum areas. In an attempt to offer a certain level of recognition to slum dwellers, sometimes government representatives are also invited to participate in inauguration sessions or relevant meetings of the users committee. Nevertheless, according to new decentralization policies, involvement of LGB in water supply and sanitation management is to become gradually more meaningful. Thus, in order to favor a successful hand over of responsibilities, capacity building of local bodies and proper coordination of concerned stakeholders will need to be extensively promoted.

On the other hand, the provision of a good service is extremely related with the clear division of roles and responsibilities for the operation and maintenance of the scheme. In large schemes, professional staff is usually contracted full time to undertake operation and maintenance tasks. In small schemes, users usually work voluntarily, without receiving any compensation, and therefore they may lack enough motivation to accomplish their task in the long term. Giving incentives, e.g. monthly salary, exception to pay water tariff, etc., to those working to operate and maintain the system, is recommendable to ensure long lasting involvement of the volunteers. Creation of an operation and maintenance fund with a sporadic or monthly contribution, even if it is modest, allows having some fund available for both recompensing the personnel and repairing the system promptly. In a very poor area at the outskirts of Birendranagar Municipality (Shreenagar-Nepal), the users committee is collecting a monthly O&M tariff of NRs.10 per month to pay the plumbers salary and cover minor O&M expenses. However, the users committee needed to ask for external support to undertake large repair of the system. Similarly, the local community managing large schemes in Dhulikhel and Damak (Nepal) are all unable to expand the installations due to the associated high cost, despite they are running with profit and there is high demand for new connections. Generally, local institutions lack the capacity to make large investments and therefore, they are compelled to seek support from the central government or the international community, which is not always available.

Water supply and sanitation interventions not only benefit community from the health perspective, but also bring about other development opportunities. Water supply and sanitation interventions are increasingly integrated with income generating activities such as saving and credit groups, as seen in Sirajgonj

(Bangladesh). Furthermore, community-led interventions enhance the organizational capacity of the community and therefore, they are likely to motivate people to initiate other development activities after completion of the project. The empowerment of community through water and sanitation interventions appears as a good means of triggering an enhanced development of poor communities.

#### Some Recommendations

- ⊙ Local Government Bodies should take initiative to recognize the urban poor in their policies. Similarly, a suitable procedure to provide legal status and recognition to the users committees located in squatter settlements should be sought.
- ⊙ Special provisions for the very poor are to be incorporated in water supply and sanitation programmes.
- ⊙ Promoting networking/forum of users groups is advisable to enhance the capacity of individual committees.
- ⊙ Establishing rules and regulations for committee actions and the registration of the users committee enhances sense of responsibility and favours a good functioning of the users committee.
- ⊙ Giving incentives to those working as volunteers to manage and maintain the system encourages long-term involvement of the personnel.
- ⊙ Incorporation of both incentives and penalties promotes regular payment of monthly tariff.
- ⊙ The support given to the users committee by the facilitating NGO should be removed gradually to ensure autonomy of the committee.
- ⊙ A wide range of technological options for hardware installation should be presented to the community to facilitate the selection of the most appropriate technology better suiting their needs and resources.
- ⊙ Refreshing trainings and education campaigns help to fully assimilate new concepts and therefore, they should be carried out in a post implementation phase.
- ⊙ The LGB should make available financial support to enable large repairs and expansion of community-managed water supply and sanitation systems.

Table 6-1: Summary of key lessons and best practices of the case studies from Nepal

Country	Location	Key Lessons	Best Practices
Nepal	Ilam East	<ul style="list-style-type: none"> <li>◆ Small schemes receive major community participation than large schemes.</li> <li>◆ Schemes should be built with materials readily available in the region.</li> <li>◆ Clear mention of roles and responsibilities of main actors is critical for the good functioning of the system.</li> <li>◆ Community participation is higher when local institutions manage the system in compared with central management.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Promotion of equity through the provision of different connection rates using the type of house as a useful indicator of the socioeconomic status of the households.</li> <li>◆ Minor maintenance services are offered by the municipality at reasonable prices benefiting the level of service and the income of the system.</li> <li>◆ Misuse and waste of water is dissuaded and the preservation of a healthy environment is fostered with the introduction of a penalty system.</li> <li>◆ The introduction of a penalty system for polluting and misusing water fosters the maintenance of good quality water and a healthy environment.</li> <li>◆ Creation of community taps promotes water access to poor households</li> </ul>
	Damak East	<ul style="list-style-type: none"> <li>◆ Demand among users will only be created when the new water supply system offers a positive improvement compared to the previous drinking water source.</li> <li>◆ Felt need favours community participation</li> <li>◆ Local participation and the involvement of local institutions are key components of successful watsan interventions.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Different tariff rates are set depending on the size of the tap.</li> <li>◆ Provision of financial incentives to the users committee members in order to maintain the interest and working spirit alive.</li> <li>◆ Creation of an election committee to ensure a transparent election process.</li> <li>◆ Creation of a saving account to confront major maintenance expenses and a potential expansion of the system.</li> <li>◆ Installation of community taps to promote water accessibility to disadvantaged households.</li> <li>◆ Both financial incentives and penalties are used to promote punctual payment with for instance, a discount of 2% of bill amount to recompense a prompt payment and the honour of the two consumers with the most punctual payment.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Dhulikhel Centre	<ul style="list-style-type: none"> <li>◆ Partnership between main concerned stakeholders favours the sustainability of the community managed system.</li> <li>◆ Good leadership is critical to motivate community participation and to guarantee the well functioning of the committee.</li> <li>◆ Both financial transparency and high accountability favour community participation and timely payment of the water tariff.</li> <li>◆ When decisions are to be taken by many users, the process may become time-consuming and raising tariffs difficult.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Provision of a progressively declining financial support within the initial years of the intervention to ensure the autonomy of the users committee.</li> <li>◆ In order to collect arrears, the users committee is announcing the name of the defaulters in the media.</li> </ul>
	Khokana Centre	<ul style="list-style-type: none"> <li>◆ Building the awareness building on hygiene and health practices is crucial to advance the sanitation condition of the community.</li> <li>◆ Technologies are site specific and therefore, they need to be selected with caution, always considering their feasibility for a particular location.</li> <li>◆ Research studies are important to improve effectiveness and reduce the cost of technology.</li> <li>◆ Community gives more priority to water supply than sanitation.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Beneficiaries are asked to sign a written agreement prior to construction of the latrine to formalize their commitment with the programme.</li> <li>◆ If household cooperation is satisfactory half of the deposit is returned to the applicant.</li> <li>◆ All households are compelled to attend the training offered by the facilitating organization.</li> <li>◆ The facilitating organization contracted a member of community to monitor and supervise latrine construction and operation.</li> <li>◆ A demonstration action, such as the construction of a demonstration latrine, was proved to promote social acceptance efficiently.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Aalok Hiti, Lalitpur Centre	<ul style="list-style-type: none"> <li>◆ Quality of leadership influences the level of community participation.</li> <li>◆ Small projects can be easily implemented and financed by community.</li> <li>◆ A successful community led intervention needs to seek for the support of all sectors of community.</li> <li>◆ Community needs to understand the benefits of the intervention to be willing to participate in the process.</li> <li>◆ Community involvement in operation and maintenance of water supply services is likely to benefit the preservation of traditional heritage.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Establishment of rules and penalties in order to maintain the project area clean</li> <li>◆ The users attending the general assembly meeting are asked to pay NRs.300 as a renewal fee, which has allowed the collection of extra revenue.</li> <li>◆ The smart water supply system is being replicated in other areas of Kathmandu Valley.</li> </ul>
	Khadiphaka, Kathmandu Centre	<ul style="list-style-type: none"> <li>◆ Active community participation and high levels of cooperation are likely to bring about enhanced unity among community members.</li> <li>◆ Searching the involvement of local authorities is important to ensure the sustainability of the project and may reduce the eviction threat in squatter settlements.</li> <li>◆ Construction activities involving large labour contribution from community need to be carefully supervised to perform a satisfactory work.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Prior to construction, every household contributed NRs.500 to create a maintenance fund for the sewerage system. The supporting NGO also contributed some money to create the matching fund.</li> <li>◆ Those families who could not contribute with cash, due to their ultra poor condition, were allowed to contribute with additional labour.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Khairenitar West	<ul style="list-style-type: none"> <li>◆ Projects demanded by community are more likely to entail high involvement of community in all phases of the project.</li> <li>◆ Carrying out a socioeconomic survey prior to initiation of a project helps to detect real needs and the willingness to pay of the targeted community.</li> <li>◆ Ultra poor households need additional support to access water and sanitation services.</li> <li>◆ Population growth rates should be carefully considered when designing new schemes.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Forming subcommittees within the users committee -executive, advisory, supervision and monitoring, and accounting committee- enhances the accountability and management capacity of the users committee.</li> <li>◆ Applicants of a new water supply connection are charged 1% more than the interest rate of the loan to generate additional fund to support the ultra poor households.</li> <li>◆ The payment of the connection fee in installments and a progressive water tariff foster the inclusion of the poor households.</li> <li>◆ Both directly and indirectly benefited households are encouraged to participate in the general assembly, which promotes the participation of all groups of society in the decision making process.</li> <li>◆ Provision of training to the executive members of the users committee, prior to the project implementation, to strengthen their management and operation capacity.</li> </ul>
	Dandatole, Butwal West	<ul style="list-style-type: none"> <li>◆ Interest and community participation may decrease once water needs are satisfied.</li> <li>◆ Handing over the management of the fund and procurement of materials to the users committee may result in a maximization of the available fund.</li> <li>◆ Maintaining harmony among community members and legitimacy of the users committee is critical to ensure the sustainability of a community led intervention.</li> <li>◆ Community people are willing to contribute more for water supply than for sanitation.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Municipality and the facilitating NGO created a revolving loan fund to support the urban poor communities of Butwal.</li> <li>◆ Community has born a high proportion of the capital cost (80%) for the water supply project, thanks to a loan with no interest granted by municipality and the facilitating NGO.</li> <li>◆</li> </ul>

Country	Location	Key Lessons	Best Practices
	Shreenagar, Surkhet Mid-West	<ul style="list-style-type: none"> <li>◆ The involvement of community in a WSS project is likely to enhance the willingness of community to contribute in other development programs.</li> <li>◆ Registering the users committee, writing a constitution and opening a bank account favour transparency, empowerment and sustainability of the users committee.</li> <li>◆ Awareness building, demand creation and ownership feeling are essential to prevent latrine disuse and stop open defecation practices.</li> <li>◆ Providing water with acceptable quality is crucial to keep the users satisfied with the system.</li> </ul>	<ul style="list-style-type: none"> <li>◆ A very large users committee, integrating numerous schemes and subcommittees, is being created to assume a leading role in the WSS management of the district.</li> <li>◆ All households of this low income community are paying NRs.10 per month to cover part of the operation and maintenance expenses of the WSS system.</li> </ul>
	Mahendranagar Far-West	<ul style="list-style-type: none"> <li>◆ Decentralization is necessary to deliver an optimum level of watsan services.</li> <li>◆ Lack of community participation in the decision making process causes lack of ownership sense and careless attitude of users towards the system.</li> <li>◆ Partnership and fluent communication among local stakeholders leads to greater management capacity.</li> </ul>	

**Table 2. Summary of key lessons and best practices of the case studies from Bangladesh**

Country	Location	Key Lessons	Best Practices
Bangladesh	Baganbari, Mirpur, Dhaka	<ul style="list-style-type: none"> <li>◆ Providing legal entitlement to the users committee has a positive impact on the long term sustainability of the users committee.</li> <li>◆ Developing a comprehensive regulation ensures effective participation of community members and transparency.</li> <li>◆ Long-term training programmes on hygiene promotion are required to change health and hygiene practices of community.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Slum representatives are members of the watsan committee at the ward level.</li> <li>◆ The capital cost of the intervention is partially borne by the slum dwellers according to their ability to pay, which enhances their ownership feeling towards the new hardware.</li> <li>◆ The facilitating NGO acts as a guarantor for the national water authority in order to provide a legal water connection to the slum area.</li> </ul>
	Hazighona, Chittagong	<ul style="list-style-type: none"> <li>◆ The eviction threat hinders the willingness of the slum dwellers to participate in WSS improvements.</li> <li>◆ Excluding part of community from receiving the benefits of adequate water supply and sanitation has a negative impact on the hygiene condition of the overall community.</li> <li>◆ Lack of time due to high working burden of urban dwellers may impede effective participation of community people.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Establishing a local level office in the community brings about enhanced social interaction and participation.</li> <li>◆ Involvement of government representatives in public events such as inauguration of hardware fosters recognition of squatter settlements.</li> </ul>
	Ta Block Slum, Mirpur, Dhaka	<ul style="list-style-type: none"> <li>◆ Involvement of females in project activities entails positive impacts on women empowerment.</li> <li>◆ Support of local government organizations is critical to advance WSS interventions.</li> <li>◆ Minimizing the relation of dependency between community and the facilitating NGO is crucial to ensure autonomy and durability of the users committee.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The facilitating NGO acts as a guarantor for the national water authority in order to provide a legal water connection to the slum area.</li> <li>◆ Use of participatory tools such as social mapping, well being analysis, body mapping and focus group discussion to enhance community awareness.</li> <li>◆ The beneficiaries selected the most suitable technological option among a series of alternatives.</li> <li>◆ A monitoring chart is prepared by the female group to keep record of the progress on hygiene and health practices of every household.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Ghuntighar Slum, Jurain, Dhaka	<ul style="list-style-type: none"> <li>◆ Frequently, slum dwellers are compelled to pay more for water (e.g. buying water from water vendors) than better off households.</li> <li>◆ Members of the users committee need to receive trainings about how to manage and operate the institution.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The facilitating NGO acts as a guarantor for the national water authority in order to provide a legal water connection to the slum area.</li> <li>◆ Construction of cluster latrines reduces the cost of the intervention and enables to save space in densely populated areas.</li> <li>◆</li> </ul>
	Old Zimkhana, Narauanganj	<ul style="list-style-type: none"> <li>◆ Opening a bank account ensures transparency and entitlement of the users committee.</li> <li>◆ The process to convince local authorities is time consuming and frequently requires persuasion to become successful.</li> <li>◆ Creation of demand and understanding the benefits of the intervention are critical to obtain a high degree of community participation.</li> <li>◆ Illiteracy may limit effective community participation.</li> <li>◆ The positive health impact of the intervention cannot be totally achieved, unless total sanitation coverage is ensured in the community.</li> </ul>	<ul style="list-style-type: none"> <li>◆ A small office has been opened in the slum area to support the activities of the project.</li> <li>◆ Females, adolescent females and children receive hygiene training and in turn, the participants disseminate the messages among their neighbours.</li> <li>◆ Health and hygiene messages are displayed in the doors and walls of the latrines using a popular cartoon.</li> <li>◆ Large slum areas are divided into clusters to manage the water and sanitation schemes more efficiently.</li> <li>◆ The formation of an apex committee involving several neighbouring committees enhances the resilience capacity and influence of the community based organisation.</li> <li>◆ Slum dwellers are paying a modest amount to cover the OM cost of the system and the salary of the caretaker.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Sirajganj	<ul style="list-style-type: none"> <li>◆ Changing current government policy in order to recognize the urban poor is essential to favour proper delivery of WSS services.</li> <li>◆ Offering a wide range of technological options to community favours the selection of the most suitable technology to satisfy their needs.</li> <li>◆ When many different stakeholders are involved in a given programme, strong coordination and clear division of tasks are very much needed.</li> <li>◆ Water supply and sanitation programmes can be easily linked with income generating activities and so that, bring about superior benefits to the poor communities.</li> </ul>	<ul style="list-style-type: none"> <li>◆ A local government body is responsible for implementing the programme.</li> <li>◆ Saving and credit activities are used as main instruments to mobilize community.</li> <li>◆ All users committees receive an accreditation from the Pourasava conferring a sort of legal recognition to the committee.</li> </ul>
	IG Gate Slum Faridabad, Dhaka	<ul style="list-style-type: none"> <li>◆ When there are many organizations involved in a project, obtaining valuable inputs from all parties is a great challenge.</li> <li>◆ Clear definition of roles and responsibilities through the establishment of a comprehensive working procedure avoids repetition of tasks.</li> <li>◆ Urban settlements should be recognized by the government institutions to enable an ordinary delivery of water supply and sanitation services.</li> <li>◆ Giving the opportunity of selecting the most suitable technology among a range of technological options creates ownership sense and ensures the suitability of the technology to the local needs.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Two government organizations play the leading role in the programme to deliver WSS services to the slum areas of Dhaka.</li> <li>◆ Formation of a Project Implementing Committee at the ward level with the representation of main social and political actors.</li> <li>◆ Establishment of a community based organization supported by Dhaka City Corporation in each slum.</li> <li>◆ Community members were trained to monitor the change on hygiene practices.</li> <li>◆ Microcredit and saving groups are created within the project to enhance the economic status of the slum dwellers.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Sreepur, Gazipur	<ul style="list-style-type: none"> <li>◆ Special emphasis should be given to the participation of women in community level activities.</li> <li>◆ Presenting sanitation as a public good and focus on community outcomes are proved to be very successful approaches to achieve total sanitation.</li> <li>◆ Effective ignition of community and a strong facilitating process are essential to achieve total sanitation through a community led total sanitation programme.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Capacity building of local government bodies is a core element of the programme.</li> <li>◆ No hardware subsidies. Cost of latrine construction is fully born by the beneficiaries.</li> <li>◆ Only the very poor may receive some financial support.</li> <li>◆ Effective partnership between government organizations, NGOs and community was established in order to achieve the common goal of total sanitation.</li> <li>◆ Demonstration activities involving a wide range of low-cost sanitation technologies according to affordability of the households.</li> <li>◆ The leading team of the programme activated the taskforces at the ward, union and upazilla levels.</li> <li>◆ The children group effectively monitors the adoption of health and hygiene practices in the community.</li> </ul>
	Bashbaria, Sitakundo, Chittagong	<ul style="list-style-type: none"> <li>◆ Formation of a union level task force (upper tier of the local government body) is likely to reinforce the capacity of the ward level task force and benefit the overall WSS situation of the area.</li> <li>◆ Dependency of grassroots organizations on the supporting NGOs is to be minimized through a progressive hand over of responsibilities.</li> <li>◆ Involvement of the ward commissioner in WSS activities provides a positive impact on entitlement of local community.</li> <li>◆ Community Led Total Sanitation is a very cost effective modality to speed up sanitation coverage.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The watsan committee was responsible for selecting the water supply hardware to be installed in the community.</li> <li>◆ A cultural group organizes social activities such as street dramas to disseminate health and hygiene messages.</li> <li>◆ Capital cost sharing strategy based on ability to pay for the water supply and capital cost fully born by community for sanitation.</li> </ul>

Country	Location	Key Lessons	Best Practices
	Takhtarpool slum Bakulia, Chittagong	<ul style="list-style-type: none"> <li>◆ In a WSS intervention in a private slum, active participation of the land owner should be searched, as that is likely to favour other development initiatives in the slum area.</li> <li>◆ Transparency is to be guaranteed with guidelines clearly defining the steps to be followed during all the implementation process.</li> <li>◆ Lack of time may limit the active participation of slum dwellers.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Part of the capital cost (5-10%) has been contributed by the owner of the slum.</li> <li>◆ A MoU signed by the ward commissioner, the land owner and community secures the access to WSS services in the slum area.</li> <li>◆ The training module is divided into eight hygiene issues which are broadly addressed during the hygiene sessions.</li> <li>◆ The women groups carry out monitoring activities.</li> <li>◆ Among adjacent 25 households of the slum, one catalyst was selected and received training to disseminate health and hygiene messages and maintain communication with main stakeholders.</li> <li>◆ Formation of a watsan committee at the ward level with two representatives from the slum areas.</li> </ul>

## REFERENCES

- Ahmed, M.F. and Rahman, M.M. (2007) Water Supply and Sanitation, Rural and Low Income Urban Communities, ITN-Bangladesh, Dhaka.
- Ahmed, M.F and Jahan, H. (2000) Participatory Management of Low-cost Water Supply and Sanitation, ITN-Bangladesh, Dhaka.
- Rahman, M.M. (2006), Appropriate sanitation Technologies, World Health Organization Environmental Health Unit, Bangladesh.
- Ahmed, M.F. (June 2002), Preliminary Report on Rainwater Harvesting in Bangladesh, ITN-Bangladesh, Dhaka. ITN-Bangladesh, Dhaka.
- Agbenorheri, M and C. Fonesca (2005), *Local Financing Mechanisms for Water Supply and Sanitation Investments*, Background Report for WELL Briefing Note 16, WELL Resource Centre, Network for Water, Sanitation and Environment Health, UK.
- Bahl, Ray W. and John F. Linn (1992), *Urban Public Finance in Developing Countries*, Oxford University Press.
- Beall, J., Crankshaw, O., Parnell, S (2000). Victims, villains and fixers: the urban environment and Johannesburg's poor. *Journal of Southern African Studies* 26 (4), 833-855. In Paterson, C., Mara, D. and Curtis, T (2007). Pro-poor sanitation technologies. *Geoforum*, 38, 901-907.
- Bloomfield, Steve (2006), "In the Village Where Aid Makes a Vital Difference", the (RED) Edition of *The Independent*, 21 September 2006. Also available at <http://news.independent.co.uk/world/africa/article1655630>
- Cleaver, F. and Toner A. (2006). The evolution of community water governance in Uchira, Tanzania: The implications for equality of access, sustainability and effectiveness.
- Centre for Urban Studies (CUS), National Institute of Population Research and Training (NIPORT) and MEASURE Evaluation (2006). Slums of Urban Bangladesh. Mapping and Census, 2005. Dhaka, Bangladesh and Chapel Hill, USA.
- Coudouel, Aline and Stefano Paternostro, ed., (2005), *Analysing the Distributional Impact of Reforms*, The World Bank, Washington DC, 2005.
- Devarajan, S., Margaret J. Miller and Eric V. Swanson (2002), *Goals for Development: History, Prospects and Costs*, April 2002.
- DPHE, (April 2006), Water Safety Plan for Rural Water Supply System, ITN-Bangladesh, Dhaka.

DPHE, August 2005, Water Quality Monitoring and Surveillance Protocol for Rural Water Supply System in Bangladesh.

FSP (2005), *Financing the Millennium Development Goals for Water and Sanitation: What Will It take?* prepared as a synthesis paper for the Finance stream for the Global Wash Forum 2004 in Dakar, Senegal, Water and Sanitation Programme, April 2005.

Implementation Guidelines for Urban Water Point/Stand Post February 2007,  
<http://www.wateraid.org/Bangladesh>

Lenton Roberto, Albert M. Wright and Kristen Lewis (2005), *Health, Dignity and Development: What Will It Take?*, UN Millennium Project Task Force on Water and Sanitation, published for UNDP, Earthscan, London.

Lumanti *et al* (2000). The Water Supply and Sanitation Situation of the Urban Poor in the Kathmandu Valley. Kathmandu, Nepal. In UNICEF (2006). Situation of Children and Women in Nepal, 2006. Kathmandu, Nepal.

Mamtaz, R., Akter A., Water Supply, Sanitation and Solid Waste Management Situation of Slums in Dhaka City

Moffat, T. & Finnis, E. (2005). Considering social and material resources: the political ecology of a peri-urban squatter community in Nepal. *Habitat International* 29 (2005), 453-468.

NGO Forum for Urban water and Sanitation (2007), *The Question: Will the MWSP Make the Water Tariff too High?*, an unpublished article.

NGO Forum for Urban water and Sanitation (2005), *Delivering Water to the Poor: A Case Study of the Kathmandu Valley Urban Water Supply Reforms with a Special Focus on the Melamchi Project*, NGO Forum for Urban Water and Sanitation, Kathmandu, Nepal.

NPC (2002), *Tenth Plan (2002 –07)*, National Planning Commission, HMG/N, Kathmandu, Nepal.

NPC and UNCT (2005), *Nepal Millennium Development Goals: Progress Report 2005*, National Planning Commission/United Nations Country Team of Nepal, Kathmandu, Nepal.

NPC and UNDP (2006), *Millennium Development Goals: Needs Assessment for Nepal*, National Planning Commission, Government of Nepal/United Nations Development Programme, Kathmandu, Nepal.

Paterson, C., Mara, D. & Curtis, T. (2007). Pro-poor sanitation technologies. *Geoforum* 38 (2007), 901-907.

*The Kathmandu Post*, 19 November 2006

Tiwari, Bishwa Nath (2006), *Readings in the Millennium Development Goals: Challenges for Attaining the MDGs in Nepal*, Central Department of Economics, Tribhuvan University, Kathmandu, Nepal.

Tiwari, Bishwa Nath (2001), "Food Security and Vulnerability Status in Nepal," *The Economic Journal of Nepal*, Vol. 24, No. 2, April - June 2001, pp. 64 - 85

UN Population Division (2007). Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2004 Revision and World Urbanization Prospects: The 2005 Revision*, <http://esa.un.org/unup>, Sunday, November 18, 2007.

UN Millennium Project (2005A), *Investing in Development: A Practical Guide to Achieve the Millennium Development Goals*, New York, 2005. (Also available at [www.unmillenniumproject.org/documents](http://www.unmillenniumproject.org/documents))

UN Millennium Project. (2005 B) *Health, Dignity, and Development: What Will it Take?* Task Force on Water and Sanitation. <http://www.unmillenniumproject.org/documents/WaterComplete-lowres.pdf>

UNDP (2006A), *Human Development Report 2006 – Beyond Scarcity: Power, Poverty and the Global Water Crisis*, Published for the United Nations Development Programme, Palgrave Macmillan, New York.

UNDP (2003), *Human Development Report, 2003: Millennium Development Goals – A compact among Nations to End Human Poverty*, Oxford University Press, New York.

UNDP (2006), *Human Development Report 2006: Beyond Scarcity – Power, Poverty and the Global Water Crisis*, Published for the United Nations Development Programme, Palgrave Macmillan, New York.

UNDP (2006B), *Asia Pacific Human Development Report 2006: Trade on Human Terms (Transforming Trade for Human Development in Asia and the Pacific)*, Published for the UNDP, Macmillan India Limited, New Delhi.

Water Aid (2006). Total sanitation in South Asia. The challenges ahead. Discussion paper for the second South Asia Conference on Sanitation (SACOSAN).

WELL Briefing note 9 (2004) *Will it cost the earth? An overview of cost estimates for achieving the water and sanitation targets of the Millennium Development Goals*  
<http://www.lboro.ac.uk/well/resources/Publications/Briefing%20Notes/WELL%20Briefing%20Note%209%20-%20will%20it%20cost.pdf>

WFP (2001), *Nepal Food Security and Vulnerability Profile 2000*, World Food Programme, Nepal.

Winpenny, James (2003) *Financing Water for All: Report of the World Panel on Financing Water Infrastructure*. World Water Council/Global Water Partnership/Third World Water Forum

WHO & UNICEF (2004). Joint Monitoring Programme for Water Supply and Sanitation. Meeting the MDG drinking water and sanitation target: mid-term assessment of progress.

Zedillo Report (2001), *Report of the High Level Panel on Financing for Development*, United Nations, New York. (Also available at [www.un.org/reports/financing](http://www.un.org/reports/financing))

Zérah, M. (2000). Household strategies for coping with unreliable water supplies: the case of Delhi. *Habitat International* 24 (2000), 295-307.