

Assessment of water and sanitation facilities in a resettlement colony

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Brief biography: (This study was conducted in India at Madanpur Khadar (a resettlement colony situated in the outskirts of Delhi) as a part of the dissertation work done for the fulfillment of Master degree. It points out the gross absence of basic services such as drinking water and sanitation to alarming levels.)

Scholarly Abstract

Lack of safe drinking water and sanitation facilities is a major problem affecting all community's particularly rural, slums and resettlement colonies in cities. Improper sanitation facilities or their absence have contributed to the high degree of infant mortality and poor health in India. Even though a great deal of effort has been directed towards the various sanitation activities, the progress has been very slow.

A participatory need assessment study was essential to draw out a realistic plan to augment the existing water and sanitation facilities, identify the gaps in the infrastructure and list the immediate and future requirements. It was also essential to find out the current practices of the community regarding the use and maintenance of the existing infrastructure.

The present study "Assessment of Water and Sanitation Facilities in a Resettlement Colony" was an attempt to assess the water and sanitation status of a resettlement colony Khadar. The objectives of the study were: to understand the water and sanitation scenario and practices in the community and to develop community-based strategies for improved and equitable water and sanitation facilities. Mapping, focus group discussion, observation and semi structured interview were the methods used in the study to collect relevant data. The khaddar resettlement area comprises of colonies, the data was collected from each group in the area namely: Gaddha colony, Raj Nagar, A1 colony and A2 colony.

The study revealed that the water and sanitation conditions in the community were unsatisfactory with no access to clean water for drinking purpose, unclean toilets and improper disposal of waste.

The main source of drinking water for all the residents of Madanpur Khadar was handpumps (76.2 %). The remaining families relied on either packaged mineral water (13.8 %) or DJB water tankers (10 %). One hand-pump was easily found in front of a cluster of two-three households. The quality of the water from handpumps was reported to be very sub-standard. There is no fixed time for the supply of water by the DJB tankers. This was reported to be grossly inadequate, especially during summer months. The packaged mineral water was reported to cost them Rs. 20 for a 20 liters bottle.

The study revealed that the households largely depend on Community Toilet Complexes (Sulabh Sauchalay), 90 %, for their sanitation needs as they did not have space for constructing toilets inside the homes. Rs. 1 was charged per visit from the people to use water closet in the Community Toilet Complexes.

The streets are narrow and lined with water clogged drains on both the sides, causing proliferation of mosquitoes and flies. The drains are broken and solid waste from the homes, construction material is dumped in the drains causing clogging of the drains. The parks are used as dumping ground by the community.

All the respondents wanted the drinking water should be provided through taps by the Delhi Jal Board to all the households. Till such time, drinking water may be provided by Delhi Jal Board Water Tankers, but their frequency of service should be increased. Also, the Community Toilet Complexes and drains should be properly maintained and proper infrastructural facilities should be provided. Only 13.8 % of the respondents (if provided) were willing to pay for the water consumed by them from the DJB taps whereas none of the respondents agreed to pay for better sanitary facilities.

Author's Note

I completed my Masters in Community Resource Management and Extension from Delhi University and did my Dissertation on "Assessment of Water and Sanitation Facilities in a resettlement Colony" as part of the M.Sc curriculum. During the course of the dissertation I gradually developed interest in the area of Environment particularly WASH (Water, Sanitation and Hygiene) initiatives. This interest grew even more during my tenure as a Project Associate with The Vigyan Vijay Foundation, an NGO working at grass root levels in the area of Environment. I was also a part of the Unicef KCCI internship programme 2008, where I worked on writing a case study on Social Exclusion in implementing "Rajasthan Integrated Fluorosis Mitigation Programme". I am currently working as a Research Fellow with the Institute of Home Economics, Delhi University on "Gender Specific Impact of Climate Change on Household Water Poverty" a project funded by United Nations Framework Convention on Climate Change.

Keywords: Resettlement Colony, Assessment, Water and Sanitation Facilities, Community Toilet Complexes.

Acronyms

CTCs	Community Toilet Complexes
CPCB	Central Pollution Control Board
CPWD	Central Public Works Department
DDA	Delhi Development Authority
DJB	Delhi Jal Board
DoLD	Department of Land Development
DoT	Department of Transport
DoUD	Department of Urban /development
DPCB	Delhi Pollution Control Board
DTC	Delhi Transport Corporation
DVB	Delhi Vidyut Board
MCD	Municipal Corporation of Delhi
MGD	Million Gallons per day
MLD	Million Liters per Day
MoR	Ministry of Railways
MoUD	Ministry of Urban Development
MoUP	Ministry of Urban Development
NDMC	New Delhi Municipal Corporation
PWD	Public Works Department
WCs	Water Closets
WSC	Water and Sanitation Communities

Assessment of water and sanitation facilities in a resettlement colony

Background

Since May 2006, more than 150 slums in Delhi have been demolished under government pretenses of transforming India's capital into a clean and more cosmopolitan "world city." Home to the city's labourers and working class, slum colonies have come under increasing attack by politicians and more elite residents who criticize the specter of poverty as leaving a black mark on the growing image of a "shining India." With the upcoming 2010 Common Wealth Games to be held in Delhi, demolitions have sped up to make way for a sports stadium and other commercial centers.

The slum demolition process has resulted in dire human rights violations of India's largest urban population, the working poor. Evicted from well-established squatter communities in the heart of the city, many poor families have been shipped out of sight, and often out of mind, sometimes disappearing altogether from the city. Squatters able to prove their right to resettlement—a difficult process that requires documentation of having lived in Delhi prior to 1998—are eligible to purchase a tiny one-room home on the periphery of Delhi. Yet the amenities and conditions of poverty in resettlement areas are among the worst in the city, as many of these colonies lack basic water and sanitation infrastructure, and are further excluded from employment opportunities, education and medical facilities.

In India, the social and economic costs of water and sanitation related diseases are disastrous. Typical consequences are loss of income and human productivity resulting in more poverty to the family and loss of gross national product (GNP). It has been calculated that India loses 180 crores man-hours each year due to diseases related to water and sanitation (UNICEF, 1988). Hence, sanitation should not be seen only as the proper disposal of human excreta by the use of sanitary latrines but the proper sewage disposal in all paradigms.

Serious problems stand in the way of efforts to expand and sustain water supply and sanitation system in the country. The crisis of safe drinking water and sanitation has reached a critical stage in India. Securing adequate water supply, which is the very basis for human

survival is one of the most critical problems. Lack of safe drinking water and sanitation facilities is a major problem affecting all community's particularly rural, slums and resettlement colonies in cities.

The rise of resettlement colonies have added to the problems of poor. The deprived populations have been sent to the peripheries using instruments such as master plans, environmental legislations, slum clearance/rehabilitation projects etc. It thereby successfully carries out a process of sanitization. Functioning of informal land market, too, has facilitated a process of socio-economic segmentation through population redistribution within and around the city.

Even though a great deal of effort has been directed towards the various sanitation activities, the progress has been very slow. Required basic facilities are not being met and undersupply what is needed by the informal settlements.

Complexity of Governance

Since Independence Delhi's urban growth and city management has largely been determined or influenced by the approach, policies and strategies of the central government. Delhi has been an experimentation ground for many kinds of local institutions and political set-ups without having any autonomy of their own. The city has ended up being "over-governed" by all three levels of governance (National, State and Local). There is multiplicity of authorities with overlapping responsibilities/functions (refer table 1). The city lacks good governance despite the existence of 118 line departments responsible for city management, three planning boards for city and regional planning, namely, National Capital Region Planning Board (NCRPB), Delhi Metropolitan Council (DMC) and Delhi Development Authority (DDA).

There are a number of service providers for Delhi, namely, Municipal Corporation of Delhi (MCD), New Delhi Municipal Council (NDMC), Delhi Cantonment Board (DCB), Delhi Jal Board (DJB), etc. (Water Aid 2005). The Delhi Jal Board (DJB) is responsible for production of drinking water in Delhi and its distribution in the areas under the control of the Municipal Corporation of Delhi (MCD). It supplies water in bulk to New Delhi Municipal Corporation (NDMC) and Delhi Cantonment Board (DCB) for further distribution in their respective areas. The Delhi Jal Board is responsible for treatment and disposal of wastewater through a network of about 5600 kms. of internal, peripheral and trunk-sewers. Solid waste

collection and disposal is the responsibility of STP Municipal Corporation of Delhi, New Delhi Municipal Council and Delhi Cantonment Board in their respective areas (Water Aid, 2005).

Table 1: Complexity of Governance: Institutional Share in Responsibilities

Issues	Concerned Agencies (in order of Importance)	Result
Housing provision of serviced plots for housing to accommodate growth	Delhi Development Authority (DDA) Municipal Corporation of Delhi (MCD) Department of Land Development (DoLD) Ministry of Urban Development (MoUP) Delhi Jal Board (DJB) Delhi Vidyut Board (DVB) New Delhi Municipal Corporation (NDMC)	Lack of houses leading to unauthorised colonies, growth of squatters, lack of infrastructure.
Environmental pollution	Central Pollution Control Board (CPCB) Delhi Pollution Control Board (DPCB) Delhi Jal Board(DJB) Municipal Corporation of Delhi (MCD) New Delhi Municipal Corporation (NDMC) Delhi Transport Corporation (DTC)	Land, water, air and noise pollution, environmental health related problems
Habitat Improvement for urban poor	New Delhi Municipal Corporation (NDMC) Municipal Corporation of Delhi (MCD) Delhi Development Authority (DDA) Ministry of Urban Development (MoUD) Department of Urban /development (DoUD)	Slum-up gradation or relocation do not get momentum

Source: Compilation from Virendra Prakash Committee Report on MCD, 2001, p.10-36 and

Marlo Pinto, Metropolitan City Governance in India, Sage Publications, 2000, pp. 129-161

The direct control and interference of the Central Government in the city's administration denies the right of citizens to participate in city governance and renders constitutional belief of decentralized 'local self governance' expressed through 74th constitutional amendment meaningless. While Delhi's citizens elect their municipal councilors and MLAs and seek their help in addressing their needs of land security and services, all important decisions regarding city planning and management of land and municipal services continue to be taken by officials and legislative heads appointed by the central government. The town planning department of the MCD still holds the key, to the entire development of Delhi, having prime significance in the interpretation and correct implementation of the Master Plans and Land Use Regulation, as well as in the field of urban planning. It definitely plays a more important role in planning and implementation of Master Plan than the Government of National Capital Territory Delhi (Water Aid, 2005).

People in resettlement sites mostly have leasehold properties and, therefore, have no fear of eviction. The level of amenities provided by public agencies, however, is very low because of scarcity of funds and low collection of user charges. Poor re-settlers, who have been rendered vulnerable because of economic displacement, are hardly in a position to improve their environment either through individual or group efforts. The conditions worsened as a large number of plots have been by speculators, who made no investments in land or housing. The quality of living, thus, was extremely low in settlements in the initial stage of development.

Scenario of Delhi “Informal Settlements”

Delhi with a population of 13.78 million is the third largest, the fastest growing and most densely populated city in India. Delhi has been growing by approximately 1,000 persons every day for a number of years. Migration has roughly averaged 1.3 times the natural growth in Delhi (Verma, 2002). The city has witnessed an increase of population at a phenomenal rate of 4.6 per cent annual (1991-2001), double of the national average of 2.34 per cent and more than the urban growth rate of any city of the country. The state of Delhi sprawls in an areas of 1,486 sq kms, of which the developed urban area is 525 sq kms. As Delhi swells due to a large influx of migrants from smaller cities, towns and rural areas with unmatched provision of housing and basic amenities, 'informal settlements' increase in

numbers, sizes and densities (Refer Table 2).

Table 2: Inequitable Provision of Basic Services

Basic Services	Norms for Formal Housing	Norms for Informal Housing	Actual Provision in Informal Settlements
Water	363 lpcd Individual Supply	40 lpcd, 1 community stand post for 150 persons	30 lpcd
Sanitation	Individual toilets connected to city level sewerage system	Community toilets; one seat for 25 persons	One seat for 111 persons only 75 per cent with sewerage cover
Solid Waste Management	Household level collection	Deposit at nearest garbage point	44 per cent gap for all city
Electricity	Individual metered connections 150 units per individual per day	Street light and some individual metered connections through group contractor 12 units per individual per day	30 per cent gap; Complete coverage with un-metered connections 8 units per individual per day

Source :Report of a Convention, Sajha Manch, June 1999 and "Delhi Fact File, National Capital Region Planning Board, 1999

The study "Assessment of Water and Sanitation Facilities in a Resettlement Colony" was conducted to assess the water and sanitation status of Madanpur Khadar.

Research Objectives

To understand the existing water and sanitation facilities in a resettlement colony and develop community based strategies for improving and securing the sustainability of these facilities.

Specific Objectives

1. To assess the adequacy of water and sanitation facilities in a resettlement colony.

2. To gain insights into the community's practices regarding:
 - a. use of water and sanitation facilities, and
 - b. management of solid and liquid waste
3. To understand the problem of the community with respect to water and sanitation facilities.
4. To develop community-based strategies/plan for:
 - a. identifying facilities required and their location
 - b. management of the existing and new facilities.

Methodology

The present study titled “Assessment of Water and Sanitation Facilities in a Resettlement Colony” was undertaken to study the water and sanitation facilities available in Madanpur Khadar, a resettlement colony on the outskirts of South Delhi. The study was conducted to assess the gap between facilities available and those required and arrive at some community-based strategies to optimize their management.

The Madanpur Khadar resettlement colony had been divided into several blocks by the Municipal Corporation of Delhi (MCD). Gaddha Colony, Raj Nagar, A1 Colony and A2 Colony were randomly selected for the study.

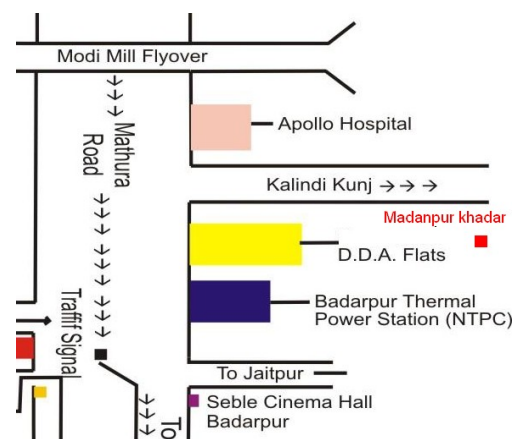


Figure 1 Location of Madanpur Khadar

Sampling technique

As mentioned earlier, the resettlement colony of Madanpur Khadar was divided into

blocks: Gadha Colony, Raj Nagar, A1 Colony and A2 Colony. It was essential to collect the data from residents of all the four blocks. For giving equal representation to the residents of each block it was decided to interview an equal number of residents. Due to the constraint of time and access, a purposive sampling technique was used to identify the sample. A conscious effort was made to select respondents from dwelling units spread in different lanes of each block.

Sample Size

The unit of inquiry was a household. However, the key respondent for collecting the data was a woman responsible for managing the household, usually the wife of the head of the household. The interviews were conducted with women from 80 households – 20 from each of the four blocks. Selection of women as key respondent was also expected to give an understanding of the gender perspective with respect to the water and sanitation facilities in the resettlement colony.

Tools for data collection

Participatory Rural Appraisal (PRA) approach was found appropriate for need assessment as it is quick, extractive and participative. This approach recognizes that people can have different perceptions and opinions about the same issue.

Following PLA techniques were used for collecting data and triangulation:

- Semi Structured Interviews
- Focus Group Discussions
- Key Informant Interviews
- Community Mapping
- Observations

Method of data collection

A Non Governmental Organisation working in Madanpur Khader area was identified and approached. Preliminary meetings were conducted with CASP PLAN (The NGO) Program Coordinators and field workers to understand their needs, explore the feasibility of using PLA and deciding the tools to be used for data collection. The community was visited with the field functionaries to understand its organization and build a rapport.

Conducting Interviews with the community

The sample for the study comprised of women living in the community. The women were approached at their home through the field functionaries of the selected NGO.

Conducting FGDs with the community

The researcher accompanied the field functionaries of CASP PLAN and/or the community volunteers associated with them on their visits in the blocks. The community members were requested to collect at a common place for a meeting. FGDs were generally conducted at the local Balwadi (community center), or outside the house of the volunteer.

Community Mapping

The community maps were made at the same places where the FGD was conducted. Initially the women were hesitant in making the maps but with the help of researcher they actively participated in the process of making community maps.

Direct Observations

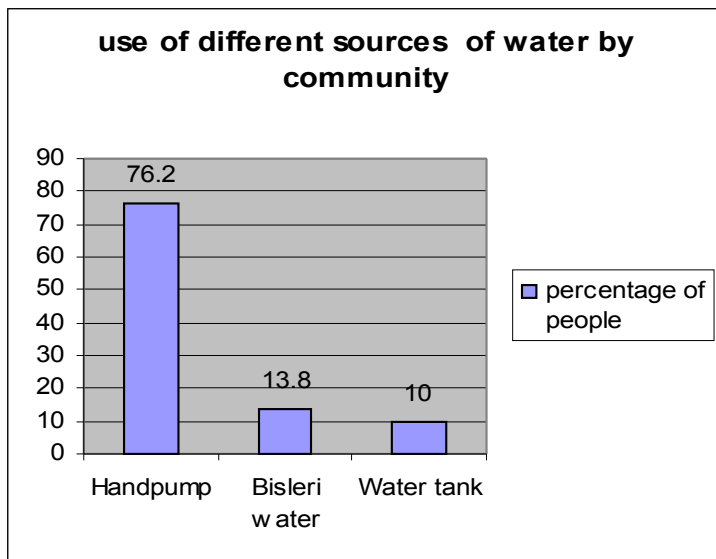
Observations were made while visiting the community for conducting the interviews and the FGDs. The researcher observed the water and sanitation facilities available in the community. The observations were very useful in understanding the practices and problems of the community with respect to these facilities.

Key Informant Interviews

The researcher identified the key informants with the help of the NGO representatives and contacted them. After fixing a prior appointment they were visited at their place of work or residence.

Findings and Analysis

The study revealed that the water and sanitation conditions in the resettlement colony were unsatisfactory. The community did not have access to clean drinking water and the main source of drinking water for all the residents were handpumps (76.2 %). The remaining families relied on either packaged drinking water (13.8 %) or Delhi Jal Board (DJB) water tankers (10 %).



Source: Survey done during dissertation work

Every cluster of two-three households had one handpump but the quality of the water from the hand pumps was very poor. The water was found to contain suspended particles, odour and was of a yellowish colour. There was no fixed time for the supply of water by the DJB tankers whose frequency of visits to the community was once or twice a week. This forced the people to purchase the packaged mineral water which was reported to cost Rs. 20 for a 20 litre bottle. The average requirement of packaged water was fifteen bottles per month, which meant an average expenditure of Rs. 300 per month. This was reported to be of exorbitant costs for the majority of the inhabitants.

The hand pump water available in all the four- blocks was reported to be contaminated and turns yellow in color after half an hour of storage. It also had a foul smell. The DJB The households had installed their

The tanker water was another alternative source of water to the Madanpur Khadar resettlement



Tanker's water
own handpump

Yellow tinted Handpump water after 2 hours of storage (collected from Raj Nagar). Nov, 2007

colony but the water supplied was absolutely insufficient to meet the present requirements of the community. The DJB Water Tanker supply was not regular. Tanker comes once or twice a week only. Waiting in long queues in anticipation was another problem faced by the people.

The study revealed that the households largely depend on Community Toilet Complexes, 90%, for their sanitation needs as they did not have space for constructing toilets inside the homes, as the plot sizes were small – 12, 18, 22 sq yards or lacked the finance required to construct one.

In Gadha Colony about 12 % houses had latrines. In the remaining three blocks 10 % of the families had a provision of latrines inside the house. Rest of the community was dependent of Community Toilet Complexes.

Inadequate provision of light and water, broken doors, lack of dustbins and cleanliness and poor maintenance rendered the facilities useless and many people from the community preferred to defecate in the open. Only 16.3 % of the people used the Community Toilet Complexes for defecation, while the rest of the people defecated (73.8 %) in open.

Community Practices: Use of Water Facilities

The required quantity of water for drinking and cooking purpose on an average was reported to be 2 buckets per day (about 60 litres) for each family. Where as, for washing and bathing purpose 8-10 buckets (240-300 litres) of water was required. The supply of water by Delhi Jal Board Tankers was once in a week and the quantity of water was not sufficient for the residents.

Community Practices: Sanitation Facilities

A majority of the people (74%) defecate in the open. And only 16.3 % of the people used the pay and use Community Toilet Complexes for defecation. In only 10% households, latrines (with tanks) were located within the houses. The men mostly defecate in open, a very few women



Children defecating in open drains and on approach road to Gadha Colony. Oct, 2007

preferred to use the Community Toilets as they were very poorly maintained and there was no light. The children defecated in the open, on nallas, drains flowing outside the house, outside the toilet blocks, in the by lanes outside the house. The reason, quoted by Sheela, a resident of Madanpur Khadar, for not having individual toilets was that “the plot sizes are too small to allow construction of latrines in the house and we don’t even have money to construct it, thus we have no alternative other than to defecate in the open”.

All the houses had an open *pucca* drain in front of them. The responsibility for cleaning and maintaining the drains was primarily with MCD authorities. However, the drains were reported to be blocked due to collection of solid waste. Only 5 % of the respondents reported that they cleaned the drains themselves occasionally. The frequency of cleaning of the drains varied from daily to monthly. But a majority of the people (68.4 %) reported that the frequency of cleaning the drains was weekly.

The solid waste from the kitchen was collected in a polythene bags and was thrown out. Municipal dustbin was there in the colony located near the Sulabh Sauchalay but people don’t go and throw the solid waste there as they consider it a tedious job to travel to the Municipal dustbin

The frequency of garbage clearance from the community was irregular and dissatisfactory. The animal excreta just lies on the lanes and gets washed away with rain water or else people throw water on it so that it enters the drain.

Water Supply: Problems Encountered

The respondents reported that the DJB tanker water supply to the community was once or twice in a week on an average which was inadequate to meet the present need of the community. The uncertainty of the supply of tanker water and the time consumed in waiting for the same was identified as a big problem. The timings of DJB water tanker supply are not fixed and erratic thus it causes the mismanagement of the routine of the people. Majority (96 %) of the households were not at all satisfied with the quality of handpump water.

Sanitation: Problems Encountered

Inadequate number of Community Toilets resulted in long waiting time especially during the morning hours.

Residents had to walk some distance, as the Community Toilet Complexes were located away from their home. Problems were experienced particularly by the children and women who found it difficult to go far and sought company to visit the Community Toilet Complexes. The people were charged Rs 1 for every visit to the Community Toilet Complexes, which accounted for an expenditure of more than 10 % of an average family's monthly income. People preferred not to use the toilets as they did not want to pay for using dirty toilets that lacked even the most basic facilities.

The women were forced by eve teasers to go in groups and not alone to use the Community Toilet Complexes. The conditions inside the Community Toilet Complexes were described to be very unhygienic and dilapidated. The toilets were often dark with no electricity and women complained of getting harassed by males while waiting in queues.

Only 10 % of the families had latrines in their house. Due to lack of sewerage system the drains from the toilet leads into the open drains outside the homes. Many of these drains were broken and/or blocked so the toilet waste collected there. This led to an ugly sight, besides breeding of flies, mosquitoes and foul smell.

Raj Nagar and A2 Colony had 2 MCD Dustbins and the other two blocks had only 1 dustbin each. The respondents reported that since the dustbins were located far from their homes, they collected their household waste in polythene bags and threw them in the drains outside their homes or at the end of their lane in a corner.

The researcher observed that the MCD dustbins had more garbage dumped outside them than inside. The garbage bins were reported to be cleaned by the MCD, usually once in a month.

Only the main approach road to reach block were properly metallic. The lanes between the plots were not metallic, therefore, they were uneven and had loose mud. The streets were lined with water-clogged drains on both the sides, causing proliferation of mosquitoes and flies. The park at Raj Nagar was used as dumping ground by the community. Garbage was spread all over the park and no grass or plants were growing.

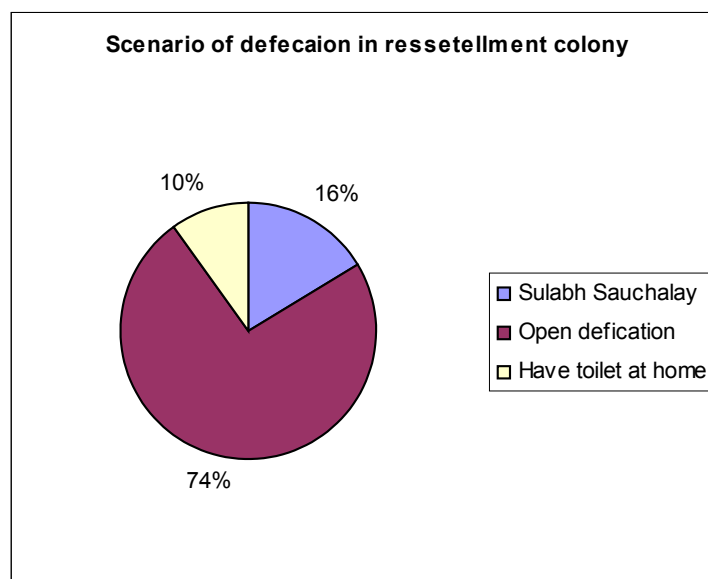
As per the report of the National Capital Region Planning Board (1999), the norms for informal housing community toilets are one latrine seat for 25 persons. However, based on the information provided by the key informants and the focus group discussions (FGDs) conducted, it was clear that the number of latrine seats available in Gadha Colony were 1 seat for 70



A closed Community Toilet Complex in Gadha Colony. Feb, 2008

people. Although, the block had 3 Community Toilet Complexes, only 2 were functional. In Raj Nagar and A1 Colony there was one latrine seat available for 78 to 60 persons respectively. In A2 Colony, there was one latrine seat available for 83 persons. There were 3 bathrooms in each Community Toilet Complex; these were available for use by women mainly. However, it was found from the caretakers of the community toilet complexes that no women used these bathrooms as they were dirty and all the families had a bathing area at home.

The Community Toilet Complexes were being run on the “pay and use” principle where Rs. 1 was charged per visit for using latrines and Rs. 2 for bathrooms, when its difficult to get two square meals a day. Therefore the respondents were not willing to pay for using these dirty and poorly maintained toilets; instead they preferred to defecate in open which further leads to unhygienic living conditions, inviting more ailments.



Source: Survey done during dissertation work

The respondents reported that as they have been uprooted from Nehru Place and Alknanda slums and have their work places situated far away, thus these people are forced to commute a long distance from their residence to the workplace adding to the economic implications. Also, access to cheap public transport such as buses in Madanpur Khadar area is an ordeal for the community.

The streets were narrow and lined with water-clogged drains on both the sides, causing proliferation of mosquitoes and flies. The drains are broken, solid waste from the houses and construction material was found dumped in the drains resulting into clogging. The only park in the locality happened to be used as a dumping ground by the community and was extremely ill maintained. There was no organized system of garbage disposal and collection, and the streets were littered with garbage and had pools of stagnant water.

All the respondents wanted the drinking water to be provided through household tap connections by the Delhi Jal Board. Until then, Delhi Jal Board water tankers should provide drinking water and the frequency of service should also be improved. Only 13.8% of the respondents were willing to pay for the water consumed from the DJB household water connections. People did not mind getting community drinking water taps provided by Delhi Jal Board at common places given that the water provided to them was free of charge. None of the respondents were willing to pay for better sanitary facilities in Community Toilet

Complexes and wanted them to be suitably maintained.

The study clearly brings out the need for creating awareness about the implications of water and sanitation in the community and mobilizing them to manage these facilities and network with local municipal authorities and non-governmental organizations (NGOs) for its own welfare.

Conclusion

Lack of safe drinking water and sanitation facilities is a major problem impacting all communities, particularly rural, slums and resettlement colonies in the city. The deprived populations have been sent to the peripheries using instruments such as master plans, environmental legislations, slum clearance/rehabilitation projects etc. Functioning of informal land market, too, has facilitated a process of socio-economic segmentation through population redistribution within and around the city. The rise of resettlement colonies have added to the problems of poor rather than solving them.

The present study “Assessment of Water and Sanitation Facilities in a Resettlement Colony” was an attempt to assess the water and sanitation status of a resettlement colony Khadar. The objectives of the study were: to understand the water and sanitation scenario and practices in the community and to develop community-based strategies for improved and equitable water and sanitation facilities. Mapping, focus group discussion, observation and semi structured interview were the methods used in the study to collect relevant data. The khaddar resettlement area comprises of colonies, the data was collected from each group in the area namely: Gaddha colony, Raj Nagar, A1 colony and A2 colony.

Focus Group Discussion was followed by Semi-structured interview which revealed the various beliefs, practices and opinions of the community people regarding water and sanitation. The study revealed that the water and sanitation conditions in the community were unsatisfactory with no access to clean water for drinking purpose, unclean toilets and improper disposal of waste.

In community the main source of water for drinking purpose is tube well, 90% of the people have there own tube well where as the rest use water from the tube well of the

neighbour. People complain as this dirty, pale coloured water is the main cause of their health problems (stomach ache, hair fall, diarrhea etc). Only 20% of the people use Bisleri water for drinking purpose, most of them live in A1 colony and have higher monthly income of 6-7 thousand as compared to other colonies which is just 3 – 4 thousand. People living in these colonies expect the Government to take curative action and provide them with portable water but most of them are not ready to pay for that water or take part in maintaining that source of water.

Sulabh Sauchalays have been provided in each colony but as people are charged one rupee per visit per person they prefer to defecate in open field or on the road side. People also complain of the lack of cleanliness in the sulabh sauchalays and thus consider it unhygienic to go and defecate there instead they prefer to defecate in an open area. Only 10% of the people have got latrines constructed in their homes. Open drainage system has been provided by the government to dispose off liquid waste from the house. Community people expect the government to take care of the cleanliness of the community but are not ready to take the responsibility and neither want to spend money on the same. Instead they expect that the use of Sulabh sauchalay should be made free of cost.

Inadequate water and sanitation facility in the community is adding to a lot of burden to the members of the community and bad health, so there is an urgent need to take some innovative actions for the sustainable development of the community.

An integrated approach linking water, sanitation, hygiene and health would improve the quality of living of the entire community. Understanding of the delivery system of water inclusive of rain-harvesting, waste-water treatment, safe disposal and overall solid and liquid waste management will help in identifying and overcoming the problems of sanitation and ensure hygiene in the communities. A plan for community based management and maintenance of water, waste and sanitation facilities will ensure that the entire community and not just a handful of people derive benefits, thereby assuring equity and sustainability. Further, a collaboration of sector-related agencies and departments for a focused implementation of the water, sanitation and hygiene programs along with the involvement of NGOs and community, especially women, could make such a plan truly participatory and ever sustaining in future.

Recommendations

Following are the recommendations stated to improve the water and sanitation conditions in the resettlement colony of Madanpur Khadar:

Drinking Water Facilities:

- As underground water is not potable, people should be made aware of poor quality of water from handpumps therefore they should be informed not to use handpump water for drinking, cooking and washing of food; it can be used for washing and cleaning.
- Community can mobilize itself to get some representatives to monitor the supply of water by DJB water tankers. Frequency of visit to each block, the quantity of water supplied and wastage of water from tankers in the process of filling up is reduced.
- Rain Water Harvesting (RWH) structures are a good alternate mechanism. Families below poverty line are eligible for subsidy to construct a RWH system.
- Reverse Osmosis plant available in the site should be repaired and made operable.

Sanitation:

- The CTC to be planned to provide a 24x7 facility to the people, the CTC should have proper supply of water and electricity with security arrangements
- Waterless urinals can be installed for community use as they generate less waste to be treated further and bio gas plant can be constructed to manage the waste and solve the problem of proper disposal of waste.
- The construction of “Eco San” Toilets should be encouraged as they require less water; hence, the community will be clean. The manure from the “Eco San” toilets and Community Toilet Complexes should be promoted to be used, as it will further help in minimizing the negative impact of commercial fertilizers on surface and ground water resources while improving the soil quality and water holding capacity.
- Initiating Door-to-Door waste collection through outsourcing for providing adequate Solid Waste Management (SWM) services to all the community members. The existing rag picker in the community can be engaged in collecting waste from each house, collection points/MCD dustbins, dump sites, road sides and drains.
- Identify the existing groups or mobilize the community to form groups who can then identify the needs for community for water and sanitation and development of other

infrastructure for the betterment of community and facilitate NGOs.

- Community should be mobilized to form Water and Sanitation Communities (WSC's) at each block. The members of these communities should preferably be women and/ or the youth. The role of these communities could be to monitor the supply and equitable distribution of drinking water, promoting awareness and the use of CTCs and creating awareness in the community for their correct usage and maintenance.
- A waste water treatment plant can be set in the community and the treated water can be used to irrigate the fields.
- The WSCs can act as centre for disseminating information of development activities initiated by different government departments or voluntary organizations.
- WSCs or NGOs can distribute educational kits, sanitation literature, pens, sketch pens and posters to WSC members and members of Youth Club to promote awareness and motivate them to work.
- The WSCs can act as organization providing loans for the construction of house hold latrines, Experience in several areas in India particularly of non governmental agencies, have indicated that communities can participate financially in a significant way.
- Another responsibility of WSCs could be to lounge complains concerning collection of garbage, blockage of drains, broken roads and drinking water to Delhi Public Grievance Commission (DPGC), an Appellate Authority under Delhi Right to Information Act, 2001. The commission hears appeals and takes decision in case the information given by the concerned government department is false or incomplete, irrelevant or not given in stipulated time.

Up-grading Greens in habitats:

- The waste collected in the parks and open spaces should be removed and greening of the area should be done. Trees such as Jamun, Neem, Peepal etc can be planted to give shade and add to the aesthetic look. This will also help in improving the air quality. These areas can be maintained by WSCs, volunteers, NGOs.
- Trees, hedges and green foliage afford bio-remediation in habitats abating impacts of local-warming and smothering adverse climatic impacts, with relief to residents.

Works Cited

- Ali, S. (2003). Environmental situation of slums in India. Delhi: Uppal Publishing House.
- Ali, S. and Singh, S. N. (1998). Major problems of Delhi slums. Delhi: Uppal PublishingHouse.
- Banerji, M. (2005). Provision of basic services in the slums and resettlement colonies of Delhi. Ensuring public accountability through community action.

- Chhokar, K. B., Pandya, M. & Raghunathan, M. (2004). Understanding Environment.
- Choudhary, Sonya Dutta, Nov. 2005, The Hindu, a review of new genre of non-fiction on cities like Delhi by William Dalrymple “City of Djinns” and Bombay by Pinky Virani’s “Once was Bombay”.
- Community- Based Hand Pump Maintenance Project: Benefits for all, UNICEF, 2001 Delhi
- Delhi Environment Status Report, WWF, 1995.
- Dhar Chakravarti, P.G. (2001). Delhi’s ongoing debate on informal settlements and work Domain, 40-46. places- Issues of environmental jurisprudence. Paper presented at the Drinking Water and Sanitation Status in India, Water Aid India. 2005 Assessment of Water and sanitation facilities in a resettlement colony. 63
- Economic and Political Weekly. (July 19, 2003). Water Consumption Patterns in Domestic Households in Major Cities.
- Economic and Political Weekly. (June 15, 2007). Government Initiatives and Incentives for Environmental Protection
- Government of India. (2007). Total sanitation campaign sanitation for all: 2012.
- Gupta, Manisha. (1992). Health and Sanitation kit for Village level motivators.
- International Journal of Environmental Consumerism, Vol 2, January- December, 2006
- Kassam, Y. (1982). Participatory research: An emerging alternative methodology in social science research. New Delhi: PRIA.
- Kathpalia, G. N. & Kapoor, R. (2002). Water policy and action plan for India 2020: An alternative future. Development research and communications group.
- Kumar, R. (2006). Research methodology -A step by step guide for beginners. New Delhi: Sage. Kundu, A. (2003). Urbanisation and urban governance: Search for a perspective beyond neoliberalism.
- Moon, Ban Ki. (2008). UN Secretary General. The Times of India.
- Nigam, A. (2001), Dislocating Delhi: A City of 1990s, Sarai Reader 01: The Public Domain, 40-46.
- Singh, K. K., & Shukla, S. (2005). Policies, Norms, Institutions & Scope of Intervention. WaterAid India.
- UNICEF. (2000). Learning from Experience: Water and Environmental Sanitation in India.

- Verma, G.D. (2002). *Slumming India: A chronicle of slums and their saviours*. Delhi: Penguin books India.
- Wadhwan, Ritu. (1995). *Rapid Rural Appraisal (RRA) for assessing the village water and sanitation status: A study in Haryana, 1-10*.
- Water Aid India. (2006). *Implementation of ADB's Water Policy in India: A Review, "Water for All?"*
- Water Aid India. (2006). *India Country Strategy 2006-10*.