No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NATIONAL RIVER CONSERVATION DIRECTORATE (NRCD)
MINISTRY OF ENVIRONMENT AND FORESTS

THE STUDY
ON
WATER QUALITY MANAGEMENT PLAN
FOR
GANGA RIVER
IN
THE REPUBLIC OF INDIA

FINAL REPORT

VOLUME IV FEASIBILITY STUDY FOR PROJECT CITIES

VOLUME IV-3 FEASIBILITY STUDY FOR ALLAHABAD CITY
PART II NON-SEWERAGE SCHEME
PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
PART V ECONOMIC AND FINANCIAL EVALUATION
PART VI STAKEHOLDER MEETING

JULY 2005

TOKYO ENGINEERING CONSULTANTS CO., LTD.
CTI ENGINEERING INTERNATIONAL CO., LTD.

GE
JR
05-038

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NATIONAL RIVER CONSERVATION DIRECTORATE (NRCD)
MINISTRY OF ENVIRONMENT AND FORESTS

THE STUDY
ON
WATER QUALITY MANAGEMENT PLAN
FOR
GANGA RIVER
IN
THE REPUBLIC OF INDIA

FINAL REPORT

VOLUME IV FEASIBILITY STUDY FOR PROJECT CITIES

VOLUME IV-3 FEASIBILITY STUDY FOR ALLAHABAD CITY
PART II NON-SEWERAGE SCHEME
PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
PART V ECONOMIC AND FINANCIAL EVALUATION
PART VI STAKEHOLDER MEETING

JULY 2005

TOKYO ENGINEERING CONSULTANTS CO., LTD.
CTI ENGINEERING INTERNATIONAL CO., LTD.

Foreign Exchange Rate:

Master Plan
US$ 1 = JPY 109.09
US$ 1 = Rs 45.33
(As of March 2004)

Feasibility Study
US$ 1 = JPY 103.66
US$ 1 = Rs 43.70
(As of February 2005)

FINAL REPORT
ON
WATER QUALITY MANAGEMENT PLAN FOR GANGA RIVER
JULY 2005

GENERAL TABLE OF CONTENTS

VOLUME IV FEASIBILITY STUDY FOR PROJECT CITIES

VOLUME IV-1 FEASIBILITY STUDY FOR LUCKNOW CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME IV-2 FEASIBILITY STUDY FOR KANPUR CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME IV-3 FEASIBILITY STUDY FOR ALLAHABAD CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME IV-4 FEASIBILITY STUDY FOR VARANASI CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME V PILOT PROJECT FOR SANITARY IMPROVEMENT OF MANIKARNIKA GHAT

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NATIONAL RIVER CONSERVATION DIRECTORATE (NRCD)
MINISTRY OF ENVIRONMENT AND FORESTS

THE STUDY
ON
WATER QUALITY MANAGEMENT PLAN
FOR
GANGA RIVER
IN
THE REPUBLIC OF INDIA

FINAL REPORT

VOLUME IV FEASIBILITY STUDY FOR PROJECT CITIES

VOLUME IV-3 FEASIBILITY STUDY FOR ALLAHABAD CITY
PART II NON-SEWERAGE SCHEME

JULY 2005

TOKYO ENGINEERING CONSULTANTS CO., LTD.
CTI ENGINEERING INTERNATIONAL CO., LTD.

FINAL REPORT
ON
WATER QUALITY MANAGEMENT PLAN FOR GANGA RIVER
JULY 2005

GENERAL TABLE OF CONTENTS

VOLUME IV FEASIBILITY STUDY FOR PROJECT CITIES

VOLUME IV-1 FEASIBILITY STUDY FOR LUCKNOW CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME IV-2 FEASIBILITY STUDY FOR KANPUR CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME IV-3 FEASIBILITY STUDY FOR ALLAHABAD CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME IV-4 FEASIBILITY STUDY FOR VARANASI CITY

- PART I SEWERAGE SCHEME
- PART II NON-SEWERAGE SCHEME
- PART III PUBLIC PARTICIPATION AND AWARENESS PROGRAMME
- PART IV INSTITUTIONAL DEVELOPMENT PROGRAMME
- PART V ECONOMIC AND FINANCIAL EVALUATION
- PART VI STAKEHOLDER MEETING
- PART VII DRAWINGS

VOLUME V PILOT PROJECT FOR SANITARY IMPROVEMENT OF MANIKARNIKA GHAT

VOLUME IV-3

PART II NON-SEWERAGE SCHEME

Table of Contents

List of Tables

List of Figures

Appendix

Abbreviations

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX

ABBREVIATIONS

CDS	Community Development Society
CTC	Community Toilet Complex
DG	Dhobighat
DUDA	District Urban Development Authority
FGD	Focus Group Discussion
IHL	Individual household Latrine
JICA	Japan International Cooperation Agency
LCS	Low Cost Sanitation
NGO	Non Government Organisation
NHC	Neighbourhood Group
NRCP	National River Conservation Plan
PP/PA	Public Participation and Awareness
RCV	Resident Community Volunteer
SPC	Sanitation Promotion Committee
SUDA	State Urban Development Authority
ULB	Urban Local Body
UPJN	Uttar Pradesh Jal Nigam
VJS	Varanasi Jal Sansthan
VNN	Varanasi Nagar Nigam
WC	Water Closet
WLC	World Literacy of Canada
WWG	Women Watching Group

CHAPTER 1

INTRODUCTION

PART II NON-SEWERAGE SCHEME

CHAPTER 1 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

River Ganga runs its course of over 2500 km from Gangotri in the Himalayas to Ganga Sagar in the Bay of Bengal through 29 cities with population over 1,50,000 ('class-I cities'), 23 cities with population between 75,000 and 1,25,000 ('class-II cities'), and about 48 towns. For ages, a belief that Ganga's magical" powers that can "cleanse any thing" has remained strongly ingrained in the minds of people. This has resulted in indiscriminate discharge/dumping of all kinds of waste and effluents into the river. Added to this, there are pollutants carried by its tributaries including Yamuna and Gomti. According to the estimates of the National River Conservation Directorate (NRCD), the sewage and wastewater that gets added to River Ganga and its tributaries is in excess of 5000 MLD. Today, Ganga is groaning under such a colossal burden.

To achieve the objective of pollution abatement, the Ganga Action Plan (GAP) took up core and non-core schemes in phases. The core sector schemes comprised interception and diversion schemes and sewage treatment plants designed to tackle pollution from point sources, i.e. pollution discharging into the river at specific points, from measurable sources, such as drains, sewage pumping stations and sewage systems. Non-core schemes comprised Low Cost Sanitation (LCS) schemes, river front development schemes, relocating Dhobighats and construction of Electric or Improved Wood Crematoria directed towards tackling non-measurable pollution (from "non-point" sources), such as dumping of solid waste and open defecation, dumping of un-burnt / half-burnt dead bodies etc.

Under the JICA-sponsored Project titled **"Ganga River Water Quality Management Plan for the cities of Lucknow, Kanpur, Allahabad and Varanasi",** a consortium (called the JICA Study Team) headed by Tokyo Engineering Consultants Company Limited, Japan (TEC), under the first phase of the project, carried out a detailed study involving identification and quantification of various pollution sources, mapping of the wastewater management infrastructure, water quality monitoring and modelling, impact of the existing river action plans in the first phase of this study. In the second phase, The JICA study team is prepared a Master Plan comprising sewerage and non-sewerage schemes, and evaluating the feasibility of implementing the master plan in one of the target cities. Whilst the sewerage scheme(s) focuses on sewage transmission system (main trunk sewers), storm water drainage[1], and sewage treatment plants, the non-sewerage schemes are directed towards improving existing facilities and/or creating additional facilities. These include Community Toilet Complexes (CTCs) and Constructed Dhobighats, away from River. In order to optimise the utilisation of existing facilities, create further facilities and realise underlying objective of "abating pollution in the River Ganga", JICA Study Team has awarded the study **"Feasibility Study of Non-Sewerage Schemes on Pollution Abatement of the Rivers Ganga and Gomti in the three cities of Lucknow, Kanpur and Allahabad in Uttar Pradesh, India"** to the consortium led by Haskoning India Private Limited, a Royal Haskoning Company.

1.2 AIMS AND OBJECTIVES

The primary aim of the proposed study is to examine the feasibility of non-sewerage schemes in the three target cities. This is proposed to be met on the basis of the following broad objectives:

- Formulation of detailed programme(s) of development of LCS (CTCs) and Constructed Dhobighats; and

[1] there is considerable disposal of waste water directly into storm water drains (or "nullahs"), which reaches the river untreated. The JICA Study Team, in its Master Plan, envisage that the ultimate solution for pollution abatement would require to bring all the wastewater to treatment plant(s) prior to disposal into the river

- Assessment of the technical, institutional, financial and economic viability, and environmental and social soundness of the programs and the facilities that will be proposed in the programme

1.3 SCOPE OF THE STUDY

The work involves carrying out the following tasks:

- Literature survey, project appreciation and planning;
- Discussions with civic bodies and concerned Government agencies;
- Carrying out a brief baseline survey to determine the ground situation in slums and Dhobighats;
- Carrying out a Community Needs Assessment (CNA) through Focus Group Discussions (FGDs) directed towards awareness generation and motivation in the target areas;
- Planning and Design (Preliminary Design) for the various facilities including typical layouts, costs etc.;
- Preparation of appropriate O&M Plan for the facilities;
- Evolving viable cost-recovery models;
- Conducting Workshops to facilitate the participation of the various stakeholders to assess the Need and Demand, and elicit their views on the proposed schemes;
- Examining and incorporating acceptable suggestions;
- Final report Preparation

1.4 LIMITATIONS OF THE STUDY

The following limitations of the study have been identified:

- Lack of adequate information of existing/planned sewage collection systems in specific localities or areas hampered accurate planning;
- The standard framework suggested for LCS requires location specific modifications. It was difficult to assess the availability of land for all the CTCs. An assessment was done only for the pilot projects and several tens of slums for the rapid land availability survey;
- In the city of Allahabad a large number of villages have been included in the municipal area, like traditional villages in U.P. which lack basic amenities are lacking though akin to slums they have different characteristics;

1.5 METHODOLOGY ADOPTED

The approach adopted for the study was participatory in nature. The methodology included detailed consultations with the stakeholders in the city of Allahabad that included officials from the Urban Local Bodies (ULBs) - Allahabad Nagar Nigam; development authorities including State Urban Development Agency (SUDA), District Urban Development Agency (DUDA), Allahabad Development Authority (ADA; Allahabad Jal Sansthan (AJS); Uttar Pradesh Jal Nigam (UPJN); and various Community Development Societies (CDSs). The processes in the study included detailed sample surveys in the target areas, focussed group discussions, individual interviews, workshops and review of available statistical/demographic information. This facilitated the Consultants to understand the needs and demand among slum dwellers for LCS, various socio-economic and environmental conditions, and the institutional aspects to develop an LCS based on appropriate technology, financial viability and sustainability. Similar exercise was carried out for the Dhobighats with the objective to understand the needs and demand of the Dhobis, the problems faced by them in their day-to-day activities of washing clothes, and willingness of the Dhobis to move from traditional to constructed Dhobighats. The techniques were selected and suitably modified based on the local conditions, nature of topic, financial resources and availability of time.

The phases in the study are described below in brief:

Phase I: Problem Identification and Process Formulation

Identification of different stakeholders

The major objective of this task was to identify different stakeholders involved and to make an assessment of nature of involvement of each in order to have a "holistic" approach.

Stakeholders involved in LCS Programme

Mobilizing stakeholders, or bringing together all the key actors in the community, who have an interest in the outcome of the LCS programme is an important component of current assignment. Consultants began this process by first identifying all those groups who have a stake in the welfare of the city. These included the users, organized grassroots community organizations, non-government institutions, non-governmental organizations (NGOs) and the relevant government departments and civic body. The spectrum of the users and the community included Community Leaders, and/or persons actively involved in promoting good sanitary practices, Neighbourhood Groups, Community Based Organizations (CBOs), and the user groups, who were the main respondents in the primary survey.

Phase II: Data Collection and Analysis

Relevant primary and secondary information was collected using various study tools' as described in Table 1.1.

Table 1.1 Tools Used for Study

Data Collected	Data Collection Tools
Need Assessment	"Chapati" Diagram
Socio-economic data	Interview Schedule method Participatory Research Approach (PRA) tool - Social mapping
Facilities	Interviews with slum dwellers Interview with CDSs PRA tool - Social and resource mapping
Health and Awareness of Sanitation	Interview with slum dwellers, FGD Primary surveys, PRA
Housing and land	Interview Schedule Transect
Water supply and sanitation situation	Interviews FGDs with target groups comprising men, women and children.
Resource and assets	Resource mapping
Gender bias	Interviews with women FGDs
Institutions and programmes	Interviews with slum dwellers
Issues and concerns	FGDs Workshop

The secondary and primary data collected along with the sources of information are respectively provided in Table 1.2

Table 1.2 List of Secondary Information collected and the corresponding sources

Information Collected	Source	Purpose
City level details Demography (population, population growth, density, settlement pattern, socio-economic structure of the town, Development plan	2001 Census Allahabad Nagar Nigam Available literature review SUDA DUDA, Allahabad	City Profile, comparison with primary survey and supplementation of data/ details
Slum Details Slums in the city, slum population, slum location and other related details	Through discussion with DUDA and Allahabad Nagar Nigam officials and obtaining data from their records	Selection of representative survey areas for baseline surveys and collection
Water supply scenario in slums O&M of CTCs	UPJN DUDA	Baseline scenario and need assessment Existing O&M
Detail of Public toilets Sewerage system Sewered and Non Sewered areas Institutional Structures Other sanitation Issues	Nagar Nigams DUDA AJS UPJN	Existing Scenario and Pilot Project formulation Existing institutional framework and plans for extension of new STPs
Prevailing norms for planning and delivery of services	Municipal Act The U.P. Water Supply and Sewerage Act, 1975 The U.P. Slum Areas (Improvement and Clearance), 1962 Centre and State Government Policies Discussions with officials of DUDA, Nagar Nigams, AJS, and UPJN	Legal provisions for facilitating creation of facilities and sanitation/ drainage facilities
Sewage disposal options	Research Designs and Standards Organization (RDSO)	Work being done by Railways to improve disposal systems for night soils
Case studies	Literature review JICA Study Report	

Phase III: Development of Standard Framework for Planning and Design

This phase involved preparation of design alternatives based on various socio economic, financial, technical and institutional factors, and make recommendations on the most suitable option(s) keeping in mind the technical soundness and sustainability. The Framework developed tried to identify the alternatives strategies for arranging the project capital cost, evaluate the strategies best responsive to community demand, and mechanism to ensure accountability, affordability and willingness to pay for the services, vital for a sustainable O&M model. It also stressed on promotion of gender equity, community participation and institutional structure to strengthen the local and community level institution.

1.5.1 Primary Survey

The selection of area was done on random bases (Stratified Random Sampling). Efforts have been made to select those areas, which have heterogeneous and representative samples, i.e. people belonging to different economic and social strata in Allahabad city. This was done in consultation with officials of DUDA and CDSs. Allahabad was divided into three different zones for the purpose.

For the CTCs, the "zoning" was carried out on the basis of the following parameters:
- Density of population;
- Proximity to river;
- Socio-economic characteristics;
- Demographic structure of population;

The three zones identified in Allahabad (for studies related to CTCs):

Zone I (Phaphamau) comprised areas to the north of city area - Phaphamau (Close to river Ganga, old habitation), and Salory (Close to river Ganga, old habitation);

Zone II (Naini) comprised areas to the south of the city area - Naini (Close to river Yamuna, industrial type habitation), Chakbhatai (Close to river Yamuna), and Ambedkar Nagar (Close to river Yamuna);
Zone III comprised the city areas - Chakia (Old habitation, located in the centre of city with moderate distance from river), and Chakniratul (Newly habitated)

1.5.2 Dhobighats

As Allahabad has only constructed Dhobighats[2] the study covered 3 out of 5 constructed Dhobighats which include Dhobighats at the following locations:

1. Civil Lines
2. Lala Lajpat Rai Road
3. Mumfordganj Medical Chauraha (Panna Lal Road)

1.5.3 Study Tools' Design

Necessary Study Tools were designed based on the inputs received from different stakeholders. Study tools used in the project include:

Questionnaire Primary Survey (QPS): Questionnaires for primary data collection was prepared in consultation with different stakeholders including the direct user groups (slum dwellers), Nagar Nigams and district/city development authorities/agencies;

1. Participatory Methodologies
2. Transect
3. Mapping
4. Primary Surveys
5. FGDs
6. Workshop

After collection of the relevant primary and secondary data analysis was carried out, which included:

1. Socio-economic and demographic profile of the residents
2. Resources
3. Sanitation profile of the community

[2] A boat survey undertaken did not indicate the presence of any fixed traditional river side Dhobighats. The Consultants were informed by the District Authorities that strict vigil is kept on the incidence of any washing of clothes in the river, and immediate action in terms of removal of Dhobis, and their washing "stones" is taken.

4. Availability of the other related facilities particularly sewerage, coverage of the area under existing/planned sewerage system etc.
5. Satisfaction level of the community
6. Area for development of facility and the type of facility to be developed for the community
7. Community preferences and choices
8. Awareness level

The objective of the Primary Survey was to obtain information on baseline conditions covering various aspects related to LCS and Dhobighats, which included a total of 339 respondents.

Table 1.3 Number of Respondents for LCS and Dhobighats

Number of respondents	
LCS	**Dhobighats**
277	62

The interview schedule using Questionnaire Primary Surveys (refer Appendix A and Appendix B) included details about socio-economic aspects such as :

1. Household profile - number of members, monthly income, occupation details, type of house, expenditure pattern, and household amenities and assets;
2. Source of domestic water, distance from the source and payment details for water;
3. Sanitation - bathing area, presence of IHL, area of defecation, health problems, type of IHL, response to pit toilet, reasons for satisfaction/dissatisfaction, CTC usage, distance from CTC, willingness to construct IHL, availability of space for IHL, natures of contribution for IHL, presence or absence of sewerage connection;
4. Awareness about hygiene and safer sanitation practices;
5. The data collected through the QPS was supplemented by notes made by surveyors in their notebooks on issues, which could not be covered in the standard format.

A **Transect** through the slum areas was done to gain an understanding of the habitat pattern spatially. **Mapping involved** spatial analysis of a wide range of issues culminating in the creation of Social Maps. These maps include details pertaining to houses, services, facilities, main roads, lanes and streets in the surveyed slum areas. The services and facilities identified on the maps reveal not only the location details, but also the issues that people perceive as "important".

1.5.4 Focus Group Discussions (FGD)

FGDs is one of the participatory techniques used to understand the behavioural aspects of the population and existing scenario with respect to specific issues. The main aim of FGDs was to understand and analyse the problems of river pollution, sanitation and environment which are very much related to the behavioural patterns and awareness of people.

FGDs were conducted with the Dhobis, DUDA officials, prominent local NGO and the community leaders in the target areas. During FGDs, the people were encouraged to express their views about the requirement and use of dhobighats. It was observed during the discussion that most of them are not satisfied with existing conditions of dhobighat. They are willing to contribute towards the construction and improvement of dhobighats. Most of them are of opinion that dhobighats should be managed by their associations. There is need to strengthen the existing institutional mechanism for more pro-active participation by dhobi community.

Majority of respondents have highlighted remuneration as major reason for the dissatisfaction. Availability of space was another reason. They were also of the opinion that dhobighats should be

constructed sector wise on the basis of settlements of dhobis.

FGDs were carried out with different sets of groups within the identified slums or target communities. Community issues, preferences and choices as well as the most suitable technological option for sanitation or management of waste water, and options for O&M were identified during the FGDs. The FGDs comprised, besides key members of the Consultants' project team, the following different sets of people:

- Traditional and informal organization(s) that existed within the community (existing groups);
- Women in the community(ies) - this allowed the women to freely express their opinion on sanitation related issues.;
- Local Community Leaders;
- Group representing the younger generation; and
- Representatives from different caste, class and income levels;

Issues identified during various FGDs are provided in ***FGD and Social maps*** in Appendix C.

1.6 STAKEHOLDER MEETING

The Consultants (Project Team) held one workshop on 16th December, 2004 in Allahabad which was chaired by the Mandal Ayukta Dr Lalit Verma, IAS and included all the concerned government officials, stakeholders, the JICA Study Team representatives and the Project Team. The workshop included an overview/ presentation of the ongoing assessment/study to the various stakeholders, policy makers, officials of ULBs and other government authorities/agencies. The agenda was to discuss the findings of the study through discussions on various aspects covered in the study. Owing to their own involvement in sanitation and hygiene aspects in slums, the participants at the workshop provided further insights and nuances on the areas covered in the study. The outcome of the workshop provided a "way forward" and laid ground for future course of action and approach for implementation and preparation of guidelines for replication of the programme proposed to be implemented through pilot project in Allahabad.

Proceedings and details of the workshop are given in Appendix D, and attendance list in Appendix E and attendance sheet in Appendix F.

CHAPTER 2

EXISTING SCENARIO

CHAPTER 2 EXISTING SCENARIO

Chapter 2 presents the baseline environmental and socio-economic information for the city of Allahabad, its slums, state of sanitation, Community Toilet Complexes (CTCs) and Dhobighats. The chapter also discusses institutional and legal aspects including existing programmes and activities of various agencies involved in Low Cost Sanitation.

2.1 STUDY AREA PROFILE

Allahabad is among the largest cities of Uttar Pradesh and is situated at the confluence of rivers - Ganga and Yamuna. The city is located at 25^{o} 28' latitude and 81^{o} 54' longitude at an average height of 98 m above msl.

2.1.1 City Profile

- Situated at the confluence of rivers – Ganga and Yamuna and a major urban, educational and administrative centre of the Uttar Pradesh (UP);
- Geographical Location: Situated at Between latitude 25^{o} 28' latitude and 81^{o} 54' longitude;
- General elevation ~ 98 m above mean sea level (MSL);
- Study Area - Municipal limits of the city, municipal area is divided into 70 wards;
- Total Urban Population: As per census 2001 Allahabad has a total population of 12,06,785, with population density of 911 persons per sq km, sex ratio of 879 and literacy rate of 62.1 %. 21.6 % of population consists of Scheduled Caste population and 0.1 % of Scheduled Tribes (Detailed demographic profile provided in Appendix G);
- Sub-tropical Climate: The climate of the Allahabad is sub-tropical. Hot and dry air with high wind velocity during peak summer and thick fog during chilly winter are the peculiar climatic features of the area.

2.1.2 Slum Profile

The city has 185 slums having a total population of 3,30,000 covering almost 27.4% of the total Allahabad population with 111 CTCs. The literacy level in Allahabad is approximately 43%. The decadal increase in slum population is given in Table 2.1:

Table 2.1 Slum population of Allahabad (1991-2001)

Year	Total Population (in lakhs)	Slum Population (in lakhs)	Percentage of Total Population
1991	7.93	0.83	10.5
2001	12.06	3.30	27.4

Source: Census of India, SUDA

The three-fold growth of slums in the last decade can be attributed to a combination of factors (refer box below).

- Poor economic conditions - can neither pay rent for proper housing nor can afford to buy a house;
- Lack of family planning measures lead to a disproportionate growth of population in slums;
- Desire to live close to one's own community;
- Involvement of religious or political groups who have vested interests in developing slums; Inability on the part of the local administration to prevent encroachment of government-owned land;
- Large-scale emergence of nuclear families;

The rapid growth and development of slums in the Allahabad city area has led to deterioration of its physical environment. Majority of slums have very poor water supply and sanitation facilities; most are either un-sewered or partially sewered, with disposal of household waste water and solid wastes taking place directly into open "nalas", which adversely affects drainage in these areas, leading to water logging. The poor environmental conditions within the slum areas have adversely affected the health of the residents. Financial constraints on the part of civic authorities and un-authorized nature of the slums have also contributed to non-delivery or partial delivery of basic amenities. The map showing slum locations is provided in Appendix H and the list of slums in Appendix I.

Social Stratification, Social and Cultural Features

- The city has two major religious communities: Hindu and Muslim. Hindus are 80% of the total population while Muslims are 18% of the population. Rest of the 2 % constitute the minorities like Sikhs, Christians and Buddhists.
- Hindus are divided into different castes including Brahmin, Thakur (Kshatriya), Bhumihars, Vaishya, Yadava, Scheduled Castes and OBCs.
- Muslims are primarily Sunnis with insignificant Shia population.
- Majority of the population speaks Hindi but some people also speak Bhojpuri (a dialect spoken in eastern U.P. and Bihar)
- In Allahabad, several festivals are celebrated, important among them include Mahashivratri in the month of February; Holi, in the month of March; Navratri culminating in Ramnavami, coming twice a year first in the months of March-April and second in month of October; Krishna Janmashthami in August-September.
- In the Hindu month of Magh (mid January to mid-february), a fair called Magh Mela takes place on the riverbanks. Every 12th year Allahabad is the venue of Kumbh Mela in which millions of pilgrims attend this festival, coming from all over India.
- One very important fact is that the city has always been known for its 'Babu Culture' implying slow and laid back nature of people.

Profile of Selected Slums

Most of the slums are well connected with roads, but the inside roads are kutcha (in poor condition) and the sanitary condition is unhygienic.. The modes of disposal are either through sewer line or open nalas. Most of slums have electricity and telephone lines.
Brief profiles of some of the major slums surveyed during the study in terms of their population, connectivity, socio-economic profile etc. are presented below:

a. Kasari Masari

Population	~ 2100
Connectivity	Poor
Local body responsible for water supply and sanitation facilities	Allahabad Nagar Nigam
Type of Drainage	Open drain
Disposal	Nullah
Current facilities	Electricity, telephone, water
Sanitation practice	Open defecation (> 75 per cent of the residents) need for a CTC now stronger as open area hitherto available is now being used to develop a new housing colony
Socio-economic profile	Mostly labourers

b. Chak Bhatei

Population	~ 560
Connectivity	Good; well-connected to a main road in Naini

Local body responsible for water supply and sanitation facilities	Allahabad Nagar Nigam
Type of Drainage	Open drains
Disposal	Open field
Current facilities	Electricity, water; poor drainage
Sanitation practice	Existing CTC not in working condition; open defecation; need to revive the existing CTC, and also construct a new CTC;
Socio-economic profile	A good mix of people of all caste and religions; low literacy and lack of awareness; women and girls in the area are trained by CDS in tailoring, beautician's activities and in making soft toys;

c. Salory

Population	3862
Connectivity	Connected to a main road via a kutcha road
Local body responsible for water supply and sanitation facilities	Allahabad Nagar Nigam
Type of Drainage	Open nullahs
Current facilities	Electricity, piped water supply
Sanitation practice	open defecation; strong demand for a CTC;
Socio-economic profile	Majority of the residents poor and illiterate; awareness level among women high, but due to non-availability of sanitation facilities majority carry out open defecation

d. Kalindi

Population	NA
Connectivity	Connected to a main road via a kutcha road
Local body responsible for water supply and sanitation facilities	Allahabad Nagar Nigam
Type of Drainage	Open drainage
Disposal	Open area
Current facilities	Electricity, telephone, no piped water supply; ground water drawn using hand-pumps/jet pumps
Sanitation practice	open defecation; preference for IHL; CTC not preferred due to difficulties in O&M; as need to revive the existing CTC, and also construct a new CTC;

e. Phaphamau

Population	5949
Connectivity	No proper roads, but well connected to a main road
Local body responsible for water supply and sanitation facilities	Allahabad Nagar Nigam
Type of Drainage	Open drainage
Disposal	Open area
Current facilities	Electricity, telephone, no piped water supply; hand-pumps/jet pumps
Sanitation practice	open defecation practiced and preferred; not interested in a CTC;
Socio-economic profile	Area dominated by Hindus with the majority belonging to the backward class; most people belong to the lower income group; majority are farmers with some involved in petty businesses;

Health Conditions and Risk

Lack of adequate sanitation facilities lead to severe health problems for the residents, and incidence of various diseases. The most prominent diseases include Dermatitis, Scabies, Bronchitis, Anemia, Poliomyelitis, Encephalitis, Tuberculosis, Lung Cancer & Asthma, Amoebiasis, Gastroenteritis, Diarrhoea/ Dysentery, Worms Manifestation Disease (Ascariasis, Tape worm), Hook worm Disease (Ankylastomiasis), Conjunctivitis & Cataract, High Infant Mortality & Miscarriage, Typhoid, Filaria & Malaria, Dengue and Malnutrition. Open defecation and unhygienic disposal of night soil can be a cause of various diseases mentioned above.

Environmental Situation

During the survey it was seen that Ganga River at Allahabad is severely polluted. Location of this city on the river bank has made the river water more vulnerable to pollution making it gradually unfit for agriculture, industrial and domestic use and to future socio-economic imbalance and ill health. Major sources of pollution include lack of sanitation facilities leading to open defecation. Most of the slums do not have any sewerage system leading to open defecation in various open areas including river banks and river flood plains adding to the pollution to the rivers.

2.1.3 Dhobighats

Allahabad has 5 constructed Dhobighats.

- Civil Lines (Kanpur Road)
- Lala Lajpat Rai Road
- Mumfordganj
- Medical Chauraha (Panna Lal Road)
- Cantonment Area

Although dhobighats are prohibited on river banks, some clandestine activity goes on river Yamuna banks.

Health Condition and Risks

The protection of health of the washermen does not seem to have been a matter of concern to any one, compared to the way concern has been shown by the government and the non-government organisations to the health hazards faced by the scavengers. The washer men collect soiled clothes from households, hotels, hospitals and other establishments for cleaning. These clothes may be soiled with pathogenic bacteria and other hazardous stuff.
Chemicals used by dhobis .i.e. detergents, solvents, bleaching agents, dyes, cause various diseases including skin diseases. Common diseases prevalent among the dhobis include Dermatitis, Eczema, Throat Irritation, Dizziness, Chronic Bronchitis,Asthma, Amoebiasis, Gastroenteritis (Diarrhoea & Dysentery), Worm Disease (Ascariasis), Hook worm Disease (Ankylastomiasis), Anemia, Conjunctivitis, Cataract, Miscarriage, Typhoid, Malaria and dengue.

Environmental Status

The waste water from the Dhobighats goes directly into the open drains without any treatment and the Dhobighats do not have adequate toilet facilities. Disposal of waste water without any preliminary treatment to the drains finally finds its way to the river, contributing to the river pollution. The lack of toilet facilities at the Dhobighats also leads to open defecation or urination. The general maintenance of the ghats was found to be poor, the Nagar Nigam is responsible for the overall management of these ghats, but the day to day maintenance is taken care of by their respective associations. Dhobighats do

not have sheds for shelter, toilets, small drying space and resting place.

2.2 INSTITUTIONAL AND LEGAL ASPECTS

This section presents a review of the existing institutional and legal framework that exists at the National and State levels. In order to meet the ultimate objective of "Pollution Abatement in River Ganga", the institutional and legal framework at the two levels essentially require close co-operation. For example, whilst the support from the National River Conservation Directorate (NRCD) under the Ministry of Environment and Forests (MoEF) to the Uttar Pradesh Government focuses on improving the collection and transmission of waste water through trunk sewers to waste water treatment plant(s), the various state level agencies have the mandate to develop/augment/strengthen sewerage networks (the "branches") in different localities, directly influencing the water quality in the rivers, and their connection to the trunk sewers. For overall abatement of pollution in the rivers the two development processes should work in a coordinated manner.

2.2.1 Relevant National and State Level Laws and Regulations

The relevant laws and regulations at National and State Levels are as follows:

- **National Level**
  - Water (Prevention and Control of Pollution Act) 1974 (amended in 1988);
  - Solid Waste Management: The Municipal Solid Wastes (Management and Handling) Rules, 2000;
  - 74th Amendment to the Indian Constitution, 1992;
  - The Employment Of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993
  - Water Quality Standards notified by CPCB.

- **State Level**
  - The U.P Slum Areas (Improvement and Clearance) Act, 1962 (amended in 1986);
  - The U.P. Water Supply and Sewerage Act, 1975;
  - Uttar Pradesh Municipal Corporation Act, 1959 (amended in 1994)

National Level Laws and Regulations

Water (Prevention and Control of Pollution Act) 1974 (amended in 1988): The Water (Prevention and Control of Pollution) Act 1974 resulted in the establishment of the Central and State level Pollution Control Boards whose responsibilities include managing water quality and effluent standards, monitoring water quality, prosecuting offenders and issuing licenses for construction and operation of certain facilities. Under this Act, the sewage must be treated before being discharged into the river. Hence for both CTCs and dhobighats, treatment is obligatory before being discharged into river/land.

Solid Waste Management: The Municipal Solid Wastes (Management and Handling) Rules, 2000 : The Solid Waste Management and Handling Rules were notified by the Central Government by exercising its powers conferred under the sections 3, 6 and 25 of EPA. These rules are applicable to all municipal authorities responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid wastes. According to these rules, every municipal authority, within its area of jurisdiction, shall be responsible for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes. The rule stress upon the need for decentralization of solid waste management and hence more pro-active role of community based organizations (CBOs).

74th Amendment to the Indian Constitution, 1992 : The Constitution of India was amended (74th Amendment Act) in 1992 to incorporate a separate Chapter on "Urban Local Bodies" (ULBs). Some of the salient features of this amendment are presented hereunder:

ULBs, to be known as Municipal Corporations, Municipal Councils or Nagar "Panchayats", depending on the population of the urban area, shall be constituted through universal adult franchise in each notified urban area of the country;

The Legislature of a State may, by law, entrust these bodies such powers and authority as may be necessary to enable them to carry out "functions", including those listed in the Twelfth Schedule, as an Institution of Local Self Government; Slum improvement and upgradation is one of the important aspects listed in the Twelfth Schedule of the Constitution;

The Employment Of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993: The Act was enacted by the Parliament on the authority of State Legislatures of Andhra Pradesh, Goa, Karnataka, Maharashtra, Tripura and West Bengal. Subsequently it was adopted by other States. The Act prohibits the construction and maintenance of dry latrines and employment of person for manual scavenging of human excreta.

Violation of the Act shall be a cognisable offence, with imprisonment for a term which may extend to one year.

Water Quality Standards : Central Pollution Control Board (CPCB) has categorised surface water into the following categories as follows:

Class A: drinking water source without conventional treatment but after disinfection;
Class B: outdoors bathing (organized);
Class C: drinking water source with conventional treatment followed by disinfection;
Class D: propagation of wildlife and fisheries;
Class E: irrigation, industrial cooling and controlled waste disposal;

There should be no visible discharge of domestic and industrial wastes into Class A waters. In case of Class B and C waters, the discharge shall be regulated/treated to ensure maintenance of the stream standards.

Ground water quality is required to meet the standards for drinking water specified in IS: 10500: Specifications for drinking water.

State Level Laws and Regulations

The U.P. Slum Areas (Improvement And Clearance) Act, 1962 [U.P. Act No. 18 of 1962 as amended up to U.P. Act 23 of 1986] : *This Act provides for the improvement and clearance of slum areas, rehabilitation of their residents and protection from eviction of tenants of such areas. The Act also makes encroachment of government lands a cognisable offence.*

The U.P. Water Supply and Sewerage Act, 1975 [U.P. Act 43 of 1975]**:** *This act provides for the establishment of a corporation, authorities and/or organization for the development and regulation of water supply and sewerage services, and for all matters therewith. It also relates to establishment, conduct of business, functions and powers of the Nagar Nigams and Jal Sansthans, all of which have a definite role in providing sanitation in the cities.*

Uttar Pradesh Municipal Corporation Act, 1959 *[Amended in 1004]*: The UP Municipal Corporation Act governs the Municipal Corporation (MC) of the city and the Water Supply and Sewerage Act governs the Jal Sansthan. These two bodies perform their respective functions as defined in the Acts but recently the 74th Constitutional Amendment has been put in place which makes

it necessary for some changes to be made in existing structures that govern *Allahabad*. The Act (UP Act No. 11 of 1959) was amended by UP Act No. 12 of 1994.

2.2.2 Institutional Framework

The water and sanitation services at city level are implemented by AJS, UPJN and Allahabad Nagar Nigam. Of these Nagar Nigam has the direct responsibility for all services and construction activities related to water and sanitation. State Urban Development Authority (SUDA) is the apex, policy making and monitoring agency for the urban areas of the UP State. The field work is done by District Urban Development Authority (DUDA) in their respective districts, which includes development of slum communities, construction of CTCs, assistance in construction of IHLs, creation of awareness etc. Figure 2.1, depicts the relationship of these organizations in connection with water and sanitation in the realm of community-based programmes.

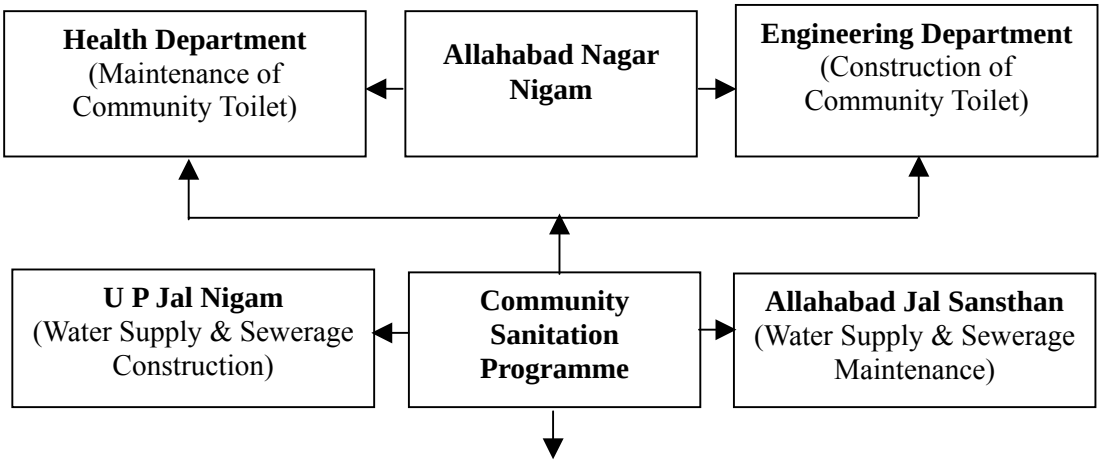


Figure 2.1 Role of Various Agencies in relation to water and Sanitation Services

State Urban Development Authority (SUDA)

SUDA is responsible for providing overall guidance to DUDA for implementation of community development programmes related to water and sanitation. State Urban Development Authority (SUDA) is the apex, policy making and monitoring agency for the urban areas of the UP State. SUDA provides overall guidance to DUDA for implementation of community development programmes related to water and sanitation. The implementation work in the field is done by District Urban Development Authority (DUDA) in their respective districts.

District Urban Development Authority (DUDA)

The responsibilities of DUDA in terms of slum development activities include

- Development of slum communities
- Construction of community toilets in slums;
- Assistance in construction of IHLs.
- Construction of drains and small bore sewers in slums;
- Upgradation of streets and roads; and
- Coordination with Community Development Societies (CDSs) for awareness building and community participation.

Although there is overlap in the nature of works carried out by DUDA and Allahabad Nagar Nigam, the activities of the Nagar Nigam are limited to the areas over which their jurisdiction extends. DUDA takes a district level viewpoint, which includes new areas of development.

Allahabad Nagar Nigam

Figure 2.2 depicts the organizational structure of Allahabad Nagar Nigam. Table 2.2, the responsibilities in relation to water and sanitation services under Nagar Nigams are listed in terms of the responsible departments within the Nagar Nigam.

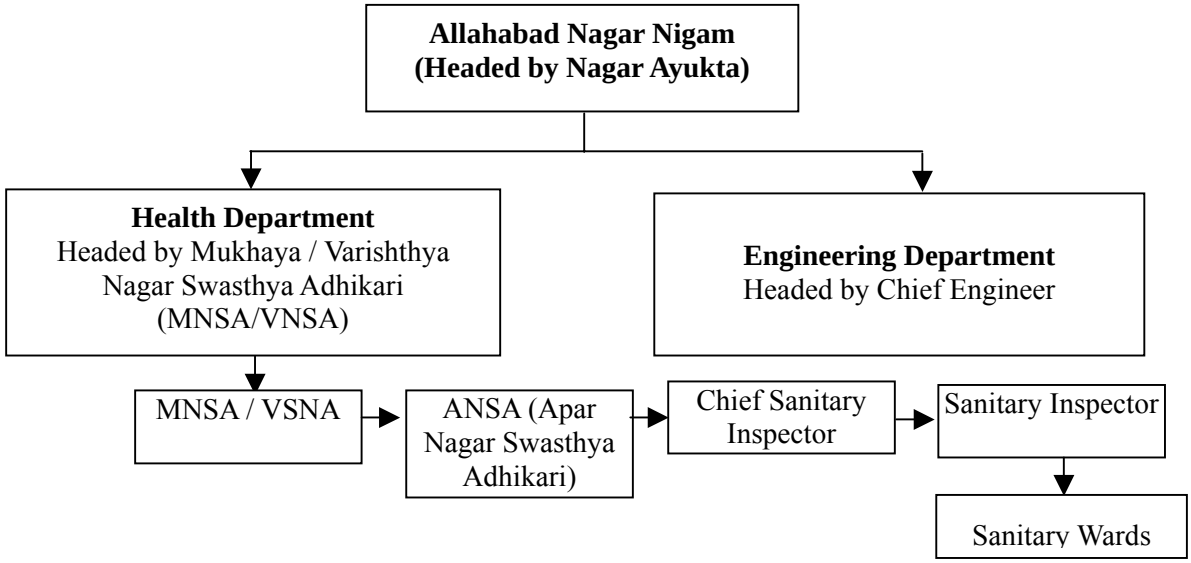


Figure 2.2 Organisational Structure of Nagar Nigam

Table 2.2 Responsibilities of Different Departments within the Allahabad Nagar Nigam

Activity	Responsibility
Construction of community toilet facilities in the slum areas	Engineering Department
Operations and Maintenance of community toilets	Health Department
PP/PA programmes related to public health	Health Department
Women and Child Development	Welfare Department

The other agencies/departments/authorities who are directly related to urban development activities at State/district/city levels are presented in Table 2.3.

Table 2.3 Other Key Organizations related to Urban Development and their Responsibilities

Organization	Responsibility(ies)
Uttar Pradesh Jal Nigam (UPJN)	Construction of water supply and sewerage network for the cities and rural areas
Allahabad Jal Sansthan (AJS)	▪ Provision of supply of potable water ▪ O&M of water supply and sewerage networks
Allahabad Development Authority (ADA)	Development of new areas, provision for housing for Allahabad city alongwith necessary infrastructure.
Non-Conventional Energy Development Agency (NEDA)	▪ Nodal agency for promotion and development of non-conventional energy sources in Uttar Pradesh ▪ Development of a new set of energy alternatives to supplement the growing energy needs

2.2.3 Relevant CBOs, NGOs and Local Associations

Community-Based Organizations

The various community-based organizations form the last, but probably the most critical link between the authorities and programme implementing agencies. These organizations are involved in community development activities and therefore, play the role of "catalyst". Their position is vital to the success of future low cost sanitation programmes in the target cities. These organizations typically have a three-tiered structure:

- Community Development Societies (CDSs)
- Neighbourhood Committees (NHCs)
- Neighbourhood Groups (NHGs)

Community Development Societies

CDSs or Samudai Vikas Samitis comprise 10 or more NHCs representing about 2500 families. These societies or samitis are created among communities to empower women in the decision-making process and enable them to put forward their needs and demands. The number of samitis in Allahabad is 30. Typically, each "samiti" has 20 members, all women, and is headed also by a woman. Meetings are held every month and proposals for funding are presented to the "Nagar Ayukta" for possible financial support. These "samitis" also network with the Health Department of the Nagar Nigams and other urban development organizations. The duties attributable to the "samitis" include:

- Identification of beneficiaries;
- Preparation of community plans and mobilizing resources;
- Monitoring of repayment and recovery;
- Liaise with Governmental and non- governmental agencies; and
- Creation of community assets and maintenance of the same.

Neighbourhood Committees

NHCs comprise 10-12 Resident Community Volunteers (RCVs) representing about 250. They are responsible for identifying the local "problems", motivating the NHGs and developing community-based credit thrift societies. They also facilitate the process of identifying the training needs and capacity building programmes.

Neighbourhood Groups

NHGs comprises women from 10-40 households with a RCV as its head. They facilitate the processes related to:

- Planning, implementation and monitoring of activities at the cluster level;
- Formation of credit and thrift society; and
- Collection of household data

2.3 EXISTING PROGRAMMES / PLAN AND ACTIVITIES (DUDA, NN, HUDCO)

2.3.1 Low Cost Sanitation Programmes & Plan

National Slum Development Programme (NSDP)

Under National Slum Development Programme, Additional Central Assistance (ACA) is being released to the States/UTs for the development of urban slums. The objectives of this programme is upgradation of urban slums by providing physical amenities like water supply, storm water drains,

community bath, widening and paving of existing lanes, sewers, community latrines, street lights etc. Besides the funds under NSDP can be used for provision of community infrastructure and social amenities like pre school education, non formal education, adult education, maternity, child health and primary health care including immunization etc. The programme also has a component of shelter upgradation or construction of new houses. An amount of almost 400 million INR was released under this program for the state of Uttar Pradesh.

Major Constraints

Field survey identified a number of constraints for the project. Constraints were technical, institutional, community related constraints, constrains of facilities etc. For successful implementation of the project following constraints need to be dealt with effectively.

Pre-Construction and Construction Stage Constraints

Technical constraints: Non-availability of sewerage in affected areas, and where available, inadequacy of capacity because of which designs could not be integrated with the most preferred option of final disposal.

Availability of Space: Availability of space is major constraint despite large open spaces lying unused in several parts. Series of discussions with Nagar Nigam, Government departments and Developmental Authorities would be necessary to finalise sites for project especially if it include resumption or acquisition of land. This will however involve resettlement of evicted residents

Support Services: For sanitation programme to be successful sufficient water supply is a must, without which well-designed CTCs would be ineffective very soon. Irregular electric supply is another constraint which hinders people from using the constructed facility at night, specially the women and children. It also hinders pumping of water for cleaning purpose.

Operation and Maintenance Constraints

Operation and maintenance of CTCs existing in slum areas causes serious problems. The amounts collected through user-charges are not sufficient to sustain the operation.

Apart from these constraints, there is no proper institutional mechanism for supervising day to day maintenance and also absence of periodical monitoring by concerned agencies. The related institutional and community constraints are discussed below:

Institutional Constraints

No effective interaction between two government agencies working for slums i.e DUDA and Nagar Nigam.

No coordination between government and community. There is no mechanism by which either DUDA or Nagar Nigam gets feedback relating to satisfaction of community

Community Constraints

Communities have less belief in organisation like Nagar Nigam despite of the fact that its Council is an elected body, as they have failed to provide adequate sanitation facilities.
Difficult to change social habits like open defecation
Mobilising community is a tedious process which becomes complicated due to heterogeneous mix of city slums.

Dhobighats

Facility Constrains

The followings explain constrains and situation of existing Constructed Dhobighats.

- No shading
- Not enough space for drying clothes
- Leaked tanks and pipes

Sl. No.	Name of Dhobi Ghat	No. of Unit/	No. of Users/ day	User Fee	No. of cloths / person	Water Supply	Waste water Disposal	O&M Organisation
1	Kanpur Road near Boys High School	40	20 to 25	No Fee	50	Jal Sansthan	Into Nala	Local Dhobi Association
2	Mumford Ganj	29	25 to 30	No Fee	25	Tubewell	Into Nala	Local Dhobi Association
3	Mori Daraganj	16	8	No Fee	60 to 75	Jal Sansthan	Into Nala	Local Dhobi Association
4	Behind Medical College on Pannalal Road	30	15	Rs. 800/- for electricity	40 to 50	Tubewell	Into Nala	Local Dhobi Association
5	Meera pur near Kalyani Devi	10	8 to 12	No Fee	30 to 35	Jal Sansthan	Into Nala	Local Dhobi Association

O&M Constraints

Dhobis have their own O&M through their associations for which each member makes contribution. One of the important constraint relating to O&M in Dhobighats is the lack of funds. Water for washing clothes is another constraint. No assistance or guidance is provided by the Nagar Nigam. The wastewater generated is also directly discharged into the nearby open nala.

CHAPTER 3

SITUATION ANALYSIS

CHAPTER 3 SITUATION ANALYSIS

3.1 ANALYSIS OF SANITATION CONDITIONS IN SLUMS

3.1.1 Baseline Environmental Status

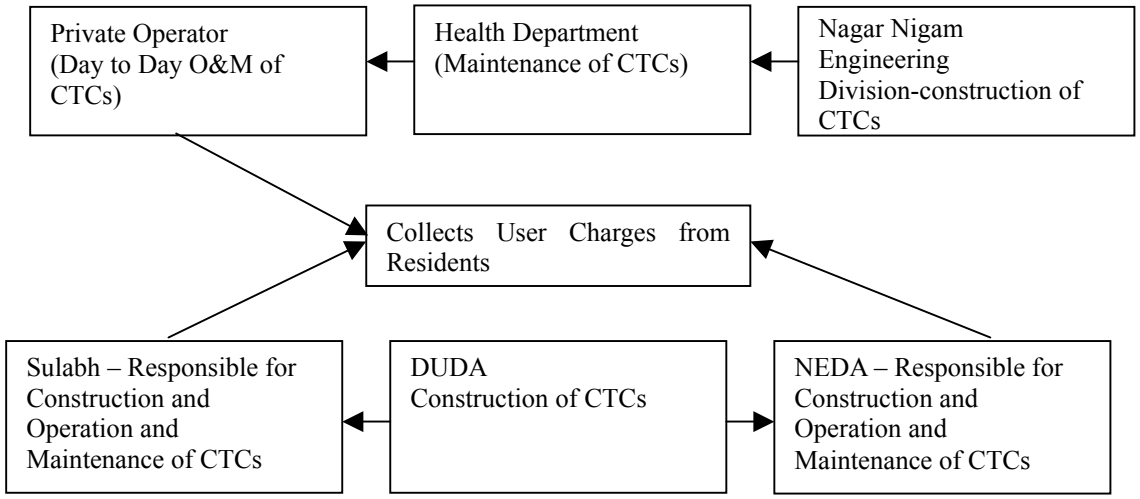
Ground Water Level and Quality: The depth of ground water varies from 1.85 m to 20.0 m mostly in a shallow aquifer. The analysis of ground water quality is given in Table in Appendix J. In most of the areas the water quality parameters including nitrates, total hardness and Fluorides have either exceeded the desirable limit or are very close to the permissible limits defined in per IS: 10500 (BIS 1991).

3.1.2 Lessons from Existing Facilities and O&M Issues

An overview of LCS facilities in Allahabad

There are 111 CTCs situated at different locations in the city which are not adequate resulting in majority of the slum population carrying out open defecation. Of the total CTCs 91 CTCs have been constructed by Nagar Nigam and 20 by DUDA. Out of these 103 are operational and 8 non operational. In 23 Toilet Complexes there is no reliable source of water, whereas only 81 are electrified and 30 do not have any electricity supply. For disposal of wastewater, 27 CTCs have septic tank and 84 are connected to the sewers.
The existing institutional mechanism for construction and O&M of CTCs is graphically presented in Figure 3.1. The major constraints that affect the existing institutional framework are:

- Lack of availability of space for construction of CTCs and/or IHLs;
- Limited disposal options for the waste water as majority of areas are not covered by the existing sewerage system;
- Lack of sense of ownership among the residents - facilities are looked upon as something that has been provided by the government, and it is the government's responsibility to "run" the CTCs;
- Almost no involvement of the residents in design, location or O&M of the CTCs;
- Difficulty in maintaining facilities that are affected by poor quality of construction resulting in frequent breakdowns, and eventual non-functioning of the CTCs;
- Erratic power supply leading to non-functioning of pumps and thereby inadequate water supply affecting the cleaning of CTCs;
- Resistance to payment of user charges in certain pockets leading to inadequate financial resources for O&M - "why pay for poor facilities?"
- Lack of cohesiveness or coordination between different agencies in implementation of the LCS programmes;
- No mechanism for obtaining feedback from the users for any improvements;



Note : O&M entrusted to Sulabh/ NEDA is also done through local contractors

Figure 3.1 Existing Institutional Mechanism for Community Toilet Complexes (CTC)

3.1.3 Survey Details and Findings

In order to assess the need and demand for LCS facilities in the slums, and to identify various issues and concerns of the slum dwellers pertaining to LCS, a combination of quantitative and qualitative assessment techniques were used, which have been described in detail in Chapter 1 section 1.4.1.

While the Participatory methodologies were used to get a qualitative insight of the issues and concerns of the inhabitants, and their preferences and priorities for the LCS programme, the interview schedule was used to get in-depth quantitative information about the inhabitants, their socio economic profile, availability of infrastructure, sanitation details, and their capacity and willingness to pay for the preferred service. The results of the assessment were used to derive the most appropriate and sustainable solution for the community. Primary survey was carried out based on scientifically designed questionnaire covering 25 slums i.e., almost 15 percent of the total slums. The slums for primary surveys were decided in close consultation with Nagar Nigam, Jal Sansthan, District Urban Development Authority and social organizations working in the related field. List of slums alongwith the number of respondents are given in Table 3.1.

Table 3.1 List of Slums Surveyed

Name	**Name**
Ambedkar Nagar	Kailash puri
Bhim Nagar	Kalindi
Chak Bhatei	Kasari Masari
Chakadaud Nagar	Mulai Ka Pura
Chakia daakkhana	Naini
Chand pur	Phaphamau
Chauphatka	Pura Fateh Mohammad Talab
Dakshin Lokapuri	Rajroop Pur
Gaderian Pur	Ram Pur Patpar
Jai Ram Pur	Salori
Jodhwal	Swaraj nagar
Kaaji Pur	Telia Ganj
	Yamuna Bank Road

Analysis and Outcome of Sample Survey of LCS

In order to assess the need and demand for LCS facilities in the slums, and to identify various issues and concerns of the slum dwellers pertaining to LCS, a combination of quantitative and qualitative assessment techniques were used. The techniques used for the current study include different participatory methodologies, focus group discussions (FGDs), workshops with different stakeholders, and structured interview schedule.
While the Participatory methodologies were used to get a qualitative insight of the issues and concerns of the inhabitants, and their preferences and priorities for the LCS programme, the interview schedule was used to get in-depth quantitative information about the inhabitants, their socio economic profile, availability of infrastructure, sanitation details, and their capacity and willingness to pay for the preferred service. The results of the assessment were used to derive the most appropriate and sustainable solution for the community.

Quantitative Assessment

Respondent's Profile

The percentage of male and female respondents was 74.8% and 25.2% respectively.

Literacy Level

Survey indicates that the literacy level in slums in Allahabad is only 43.79% as compared to city's average of 62.1%. This is mainly due to low economic status of people residing in slums and the lack of educational facilities. Of the 25 slums surveyed, the respondents in 2 slums i.e. Ambedkar Nagar and Yamuna Bank Road were illiterate.

Table 3.2 Level of Education among the Respondents

Sr No	Educational level	Percentage
1	10^{th} pass	11.67%
2	11^{th} pass	0.36%
3	12^{th} pass	0.36%
4	8^{th} Pass	7.67%
5	Below Primary Status	11.67%
6	Graduate	7.31%
7	Inter mediate	0.00%
8	Literate	3.28%
9	Post graduate	1.47%

Percentage of Literate Respondents

Literate	43.79%
Illiterate	56.21%

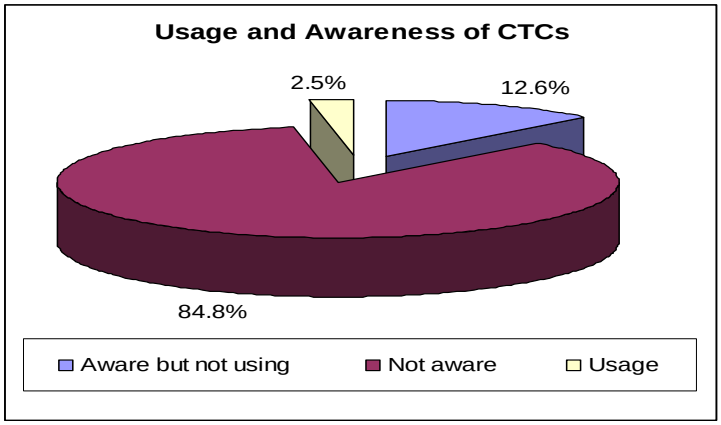
Source: Primary Survey, October 2004

Monthly Income

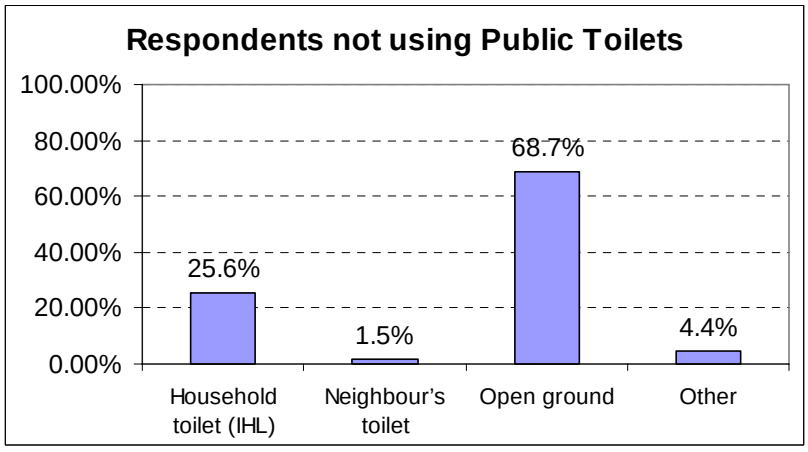
Monthly income of the family is an indicator of ability to pay for the services. However it was observed during the survey that most of the respondents were hesitant to disclose correct information about their household income. Survey results showed that the average income of respondents was approximately Rs. 1,879 per month, which is slightly above the poverty line of the state (Rs 22,548 per year).

Usage and Awareness Community Toilet Complexes

Awareness of CTCs is low i.e. about 15 percent, only about 2.5 percent population is using CTC and about 13 percent of the respondents are aware of the CTC but do not use the facility, as shown in the following graph.



Source: Primary Survey, October 2004



As per the primary survey findings about 67% (97.5% x 68.7 %) of population in slums carries out open defecation and 25% has IHL. Bhimnagar, Chakadaud Nagar and Naini are the places where maximum people (~25%) are using CTCs. These places also have higher literacy levels.

It has been observed that of all the people using CTC, maximum number of people (>70%) use the CTCs for defecation purpose followed by urination. All the residents of Chakdaud Nagar use public toilet for defecation.

Various reasons along with the percentage for non usage of existing CTCs are given in Table 3.3.

Table 3.3 Reasons for not using the CTC

Response	Percentage
Do not know	1.1%
Not clean	25.2%
Very far	1.9%
No Privacy	0.8%
Pay Money	0.00%
Other	71.2%

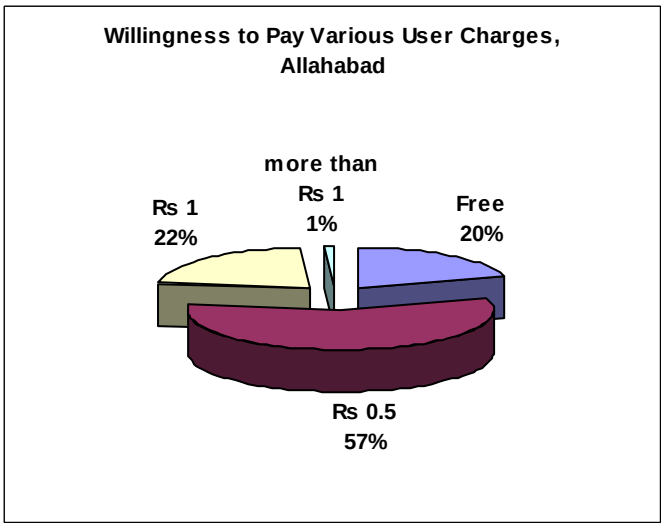
Other-Mixed type of answers
Source: Primary Survey, October 2004

Residents of Chauphatka, Kalindi and Telia Ganj cite cleanliness as the main reason for not using CTCs. About 86 percent of respondents in the slums are willing to participate in the Operation and Maintenance Activities of the CTCs as shown in Table 3.4.

Table 3.4 Willingness to Participate in Operation and Maintenance

City	Yes	No	No answer
Allahabad	85.6	13.4%	1.0%

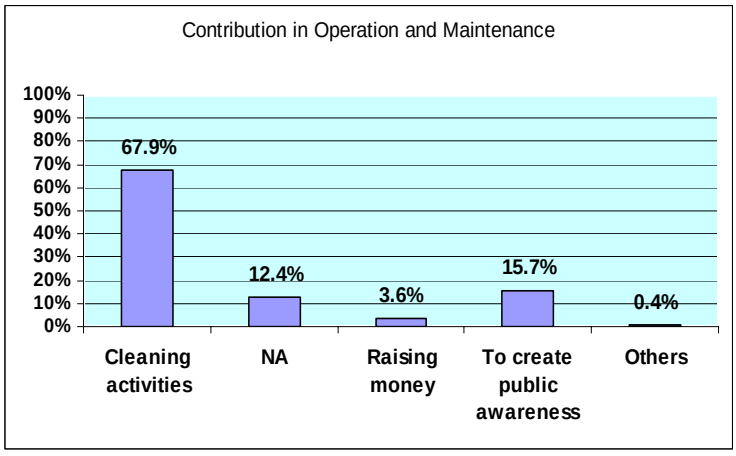
About 20 percent of users are want the CTC facility to be free of cost and various usage charges are given in the following graph.



The various ways in which the respondents are willing to participate in O&M activities with about 68 percent agreeing to contribute in cleaning activities, all the residents of Chak Bhatei, Chakia daakkhana, Chand pur, Mulai Ka Pura and Yamuna Bank Road want to contribute in cleanliness.

Community Health

The most prominent disease being Dermatitis, Scabies, Bronchitis, Anaemia, Poliomyelitis, Encephalitis, Tuberculosis, Lung Cancer & Asthma, Amoebiasis, Gastroenteritis, Diarrhoea, Dysentery, Worms Manifestation Disease (Ascariasis, Tape worm), Hook worm Disease (Ankylastomiasis), Conjunctivitis & Cataract, Typhoid, Filaria & Malaria, Dengue etc. There is also high Infant Mortality, Miscarriage and Malnutrition



Therefore preparations of action plan for sustainable development, abatement of pollution and restoration of the purity of natural resources for cleaner and healthy environment. Therefore health education and awareness has to be incorporated with any development plan if we want to derive success from it.

Health Planning at every level to minimize deficiency in preventive measures and providing safe water supply, clean surroundings, and environment will help in reducing the problems.

Observations

- Out of the total 277 respondents, the split between male and female respondents is 3:1;
- The average literacy rate in the slums surveyed is only 43.79 per cent as against the city average of 62.1 per cent. The main contributing factors are poor economic conditions and lack of access to educational facilities. In case of slums at Ambedkar Nagar and Yamuna Bank Road, the illiteracy level is almost 100 per cent;
- Monthly income of a household is an indicator of ability to pay for the services. During the survey, majority of the respondents were unwilling to disclose correct information about their household income; the average monthly income is estimated at Rs. 1880 approximately;
- The present usage level of public toilets is one of the indicators for determining the need for construction of CTCs. In case of Allahabad, most of the respondents (> 97.5 per cent) do not use public toilets. They have their own toilet (IHL), or use their neighbour's toilet, or simply go for

open defecation. When asked the reason for not using the existing public toilets, majority of the residents felt inhibited in giving a clear answer. In case of Chauphatka, Kalindi and Telia Ganj, lack of cleanliness was cited as the main reason for not using the existing facilities. The usage level in localities such as Bhimnagar, Chakadaud Nagar and Naini is higher than the other areas surveyed at about 25 per cent. In case of Chakadaud Nagar, the usage of public toilet for defecation is almost 100 per cent. In case of localities such as Kaaji Pur, Pura Fateh Mohammed Talab, Ram Pur Patpar and Yamuna Bank Road, all the residents use open grounds for defecation.

- Almost all residents in slums, when asked to choose between IHL and CTC preferred the former as, in their perception, the O&M of CTCs was difficult, a view point probably borne out of the existing situation in terms of lack of cleanliness. However, almost 70 per cent of the present non-users are willing to pay for use of public toilets provided the quality of service delivery (e.g. cleanliness) meets their expectations. 85 per cent of the respondents are even willing to participate in the O&M of CTCs. Besides the willingness to pay user charges, there are a variety of ways in which the respondents are willing to participate in O&M activities. This includes cleaning, mobilizing collection of funds and initiating public awareness.
- Most of the respondents (88 per cent) were aware of the environmental pollution caused by open defecation. Very few slum residents were aware of the direct linkage between the open defecation and health hazards.

3.1.4 Summary of Findings

Need for toilets in slums can be calculated by assessing the number of households practicing open defecation. The analysis of primary data revealed that 68.7 % of carry out open defecation that must be prevented by adding adequate CTCs for improving slum sanitation and consequently control river pollution.

Need for upgradation can be quantified by knowing the percentage of respondents who are not satisfied with the existing level of service and expressed a need for better operation and maintenance through various means. Almost 25% of the respondents do not use existing CTCs because of operation and maintenance problem i.e. they are not clean. This excludes a vast majority of respondents (~70%) who preferred not to answer the question. This is due to their reluctance to say anything, which possibly suggest consciousness of impropriety of the practice. Hence it can be concluded that proper operation and maintenance is must for ensuring optimal utilisation and sustainability of assets created.

Demand for the service is linked to individuals or households preference for the service. In order to sustain operation and carry out necessary maintenance, willingness to pay for the service or participate in some other way such as shramdan or community service is most crucial. It can be inferred from primary survey that more than 85% of respondents are willing to participate in operation and maintenance. This is also in consonance with reported willingness to pay cash for operation and maintenance which is more than 70% for Allahabad. But since the sustainability of operation can only be achieved if the user charge is Rs. 1.0 or more which is only 27%.

The demand for CTCs is also substantiated as maximum percentage of respondents are willing to contribute in different ways like cleaning activities, raising money, creating public awareness for operation and maintenance.

Availability of space in their houses for construction of IHLs is a major constraint for slum residents. This clearly underscores the need for CTCs. Various participatory techniques need to be applied in further increasing willingness to pay for service.

Slum dwellers are paying Rs. 30 per month per household as users charges. About 80% households do not pay user charges while some of them opt for open defecation. It has been observed that only about 30 households use a 10 seater CTC in slum areas. Thus fund generated as user charges is Rs. 900 per

month. The general conditions and maintenance of CTCs are not upto the desired standard, which leads to poor utilisation of these CTCs. There are slums like Kaaji Pur, Pura Fateh Mohammad Talab, Ram Pur Patpar and Yamuna Bank Road where all residents go for open defecation.

Ability to pay user charges as many of them are below poverty line - There are some of the slums like Chak Bhatei, Chakia daakkhana, Chand pur, Mulai Ka Pura and Yamuna Bank Road where all the residents want to contribute in cleanliness.

Bhimnagar, Chakadaud Nagar and Naini are places where people (~25%) are using public toilet. These are places where literacy level is higher than other slums. The level of awareness can be increased by IEC and different participatory techniques like focus group discussions, informal meetings, workshops, etc.

3.2 DHOBIGHATS

3.2.1 Environmental Status

The baseline environmental condition of the Dhobighats in Allahabad are similar to the ones in the slums as mentioned above. The environmental considerations specific to Dhobighats are related to the use of water, consumption and discharge of chemicals contained in soap, detergent and other materials used in the process, and the impact of the activities on the health, especially the skin of the washer men.

The wastewater is discharged into an adjoining drain which discharges untreated water into Ganga River.

3.2.2 Lessons from Existing Facilities and O&M Issues

Nagar Nigam is overall responsible for the management of these ghats and day to day maintenance is taken care of by their respective associations. The maintenance of the ghats was found to be poor. Majority (>80%) of the respondents are of opinion that the ghats should be managed by their own association i.e. continuation of the present practice. There is no user fee that is levied on dhobis
In general, the existing constructed Dhobighats suffer from the lack or inadequacy of the following services or facilities:

- Insufficient water supply; near absence of potable drinking water
- Absence of any roof cover for protection during the hot summer months, or any other shelter to take rest or eat food
- No arrangement for drying clothes
- No toilet facilities; absence of sanitation has made the general working environment unhealthy
- Absence of any safety arrangement for their clothes
- Effect on water supply when either the tube-well fails or there is no electricity
- No arrangement for processing washed clothes with ultramarine and bleaching agents
- Direct disposal of waste water directly into open drains without any treatment
- The arrangement of washing area necessitates washing of clothes while standing in water

3.2.3 Survey Details and Findings

Generally, the washer men carry out preliminary activities at their homes. The earlier practice was to add some reh (alkaline soil) and put the clothes in bhatti (steam vessel). The practice is giving way to the use of detergents for soaking the dirty linen but it is still persisting. The cubicles of the existing constructed dhobi ghats are only partially utilised. Reasons stated for under-utilization of the cubicles range from inadequate or uncertain supply of water to availability of more convenient alternative of temporary ghats along the river.

Selection of Study Area
The approach adopted for the study was participatory in nature. The methodology included detailed consultation with the stakeholders including officials from various development authorities like developmental authorities, Nagar Nigams, etc. Attempts have been to cover all the major dhobighats covering more than 50% of the sample size. Allahabad has only constructed ghats. Traditional dhobi ghats have been banned by government. Ghats selected for sample survey are stated below:

- Civil Lines (Kanpur Road)
- Lala Lajpat Rai Road
- Mumfordganj
- Medical Chauraha (Panna Lal Road)

Sample of the Study
The respondents were selected on the basis of purposive random sampling. 62 respondents were selected from ghats.

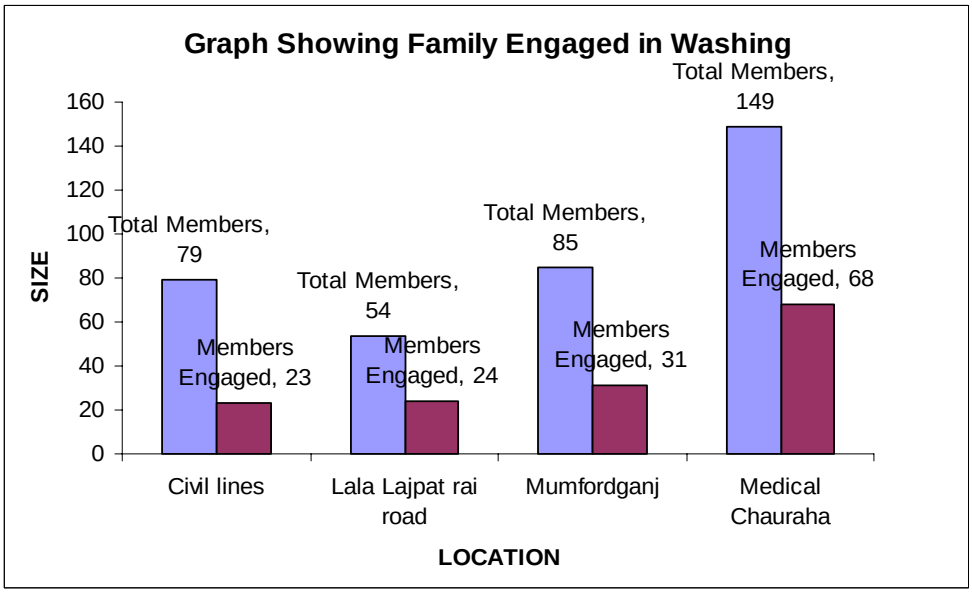
Tools of the Study
The data was collected from primary and secondary sources. The primary data was collected by interview schedule (format used is annexed in Appendix A and Appendix B), observation guidelines and 'focus group discussions' (one of PRA methods). This helped the team in the collection of qualitative and quantitative data. In 'focus group discussions' the stakeholders, opinion leaders and other formal elected members of their Panchayat had participated in the discussions to explain their perceptions on different issues for formulating and articulating the alternative strategies to solve their problems. Secondary data were collected from Nagar Nigam, Jal Nigam, census 2001, DUDA and Allahabad Development Authority.

Analysis of Data in Qualitative Frame of Reference
The findings of the structured interview schedule have been substantiated with the information gathered through focused group discussions (FGDs) conducted with the members of local population in the target areas. During FGDs the people were encouraged to air their point of view about the requirement and use of dhobighats. Almost all the FGDs had more than 50 respondents. It was observed during the discussions that most of them are not satisfied with existing condition of dhobighats. They are willing to contribute towards the construction of dhobi ghats. Most of them are of opinion that ghats should be managed by their associations only. The details of FGDs are given in Appendix C. Majority of respondents were male who operated at dhobighats with women actively participating in the activities like pressing the clothes. The literacy rate among the male (24.16%) are higher than that of female (9.15%). The literacy percentage in the study area is given in Table 3.5:

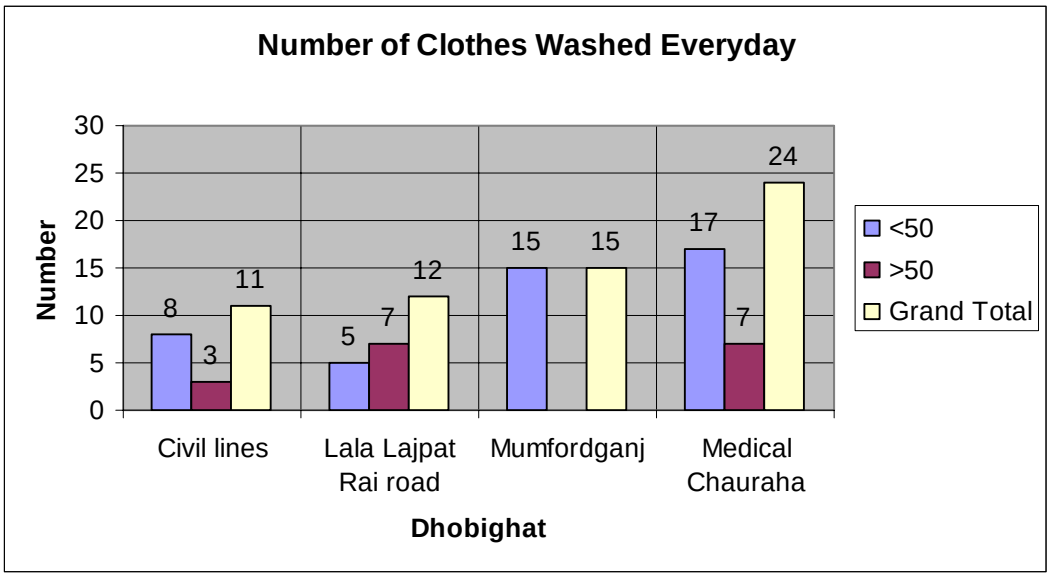
Table 3.5 Literacy Rate among the Respondents

Sex	**Percentage Literates**
Male	24.16
Female	9.15
School going children (M)	19.39
School going children (F)	3.22

The graph below indicates that the almost 40% of the family members of the respondents are engaged in washing clothes. Field survey revealed that average number of family members engaged in washing activity is largest in the Medical Chauraha ghat.

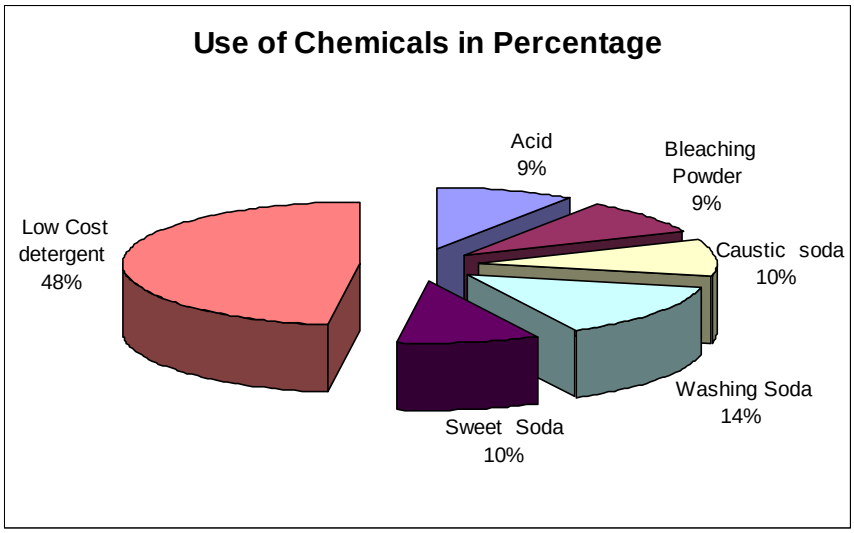


The average number of clothes washed per day by each dhobis is an important parameter for planning facilities while remodelling /relocating of ghats. An assessment was done of the number of clothes washed per day. The following graph summarizes the average number of clothes washed per day at various Dhobighats.



Use of Detergents and other material in washing clothes

Washing material used by the washermen includes soap, detergents and soda. The following table presents average quantity of material consumed per day.



Sources of water and Disposal

The source of water for all the ghats surveyed is borewell or through Jal Sansthan. In the Dhobighats surveyed, water was drawn from borewell and disposal was in the respective open drains, Nala in the vicinity.

Membership of Association

All the dhobighats are managed by their own association. More than 65% of the respondents are members of association. The Association plays a significant role in the integration of the community. Association is a forum for dhobis to collectively address or raise their issues through dialogue with the concerned local body. It also plays a significant role in solving intra-community disputes.

Table 3.6 Membership of Association

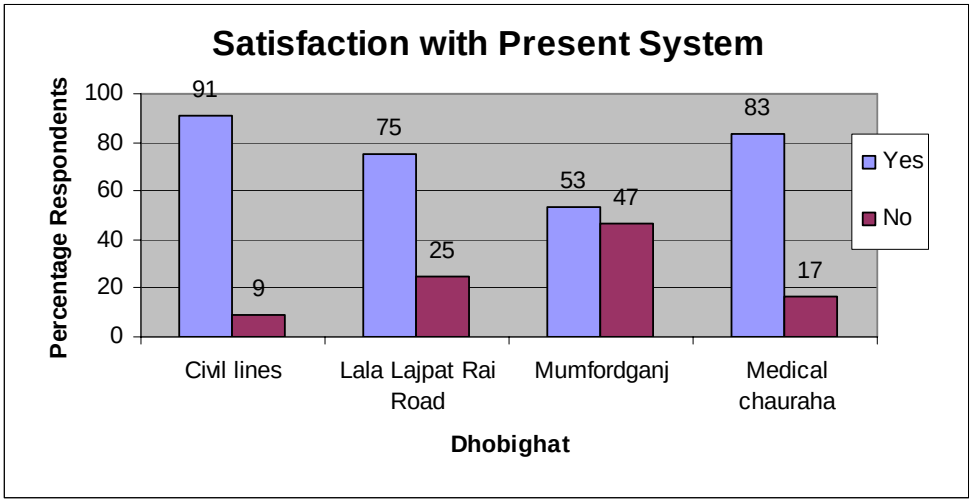
Area	**No**	**Yes**
Civil lines	3	8
Lala Lajpat Rai Road	1	11
Mumfordganj	1	14
Medical Chauraha	15	9
Total	**20**	**42**

Amount Charged per Item of Clothing

There is no uniform pattern in the charges per item of clothing, fluctuating from Rs. 2 to Rs. 10. It appears that the higher charges per item may be related to the clothes. They pointed out that it is very difficult to increase the charges per piece due to the resistance from the customers.

Satisfaction with the Present System

Most (75%) of respondents are satisfied with the present level of facilities provided at the ghats. The satisfaction level is maximum in case of Civil Lines (91%) and least in Mumfordganj (53%) as shown in the graph below.



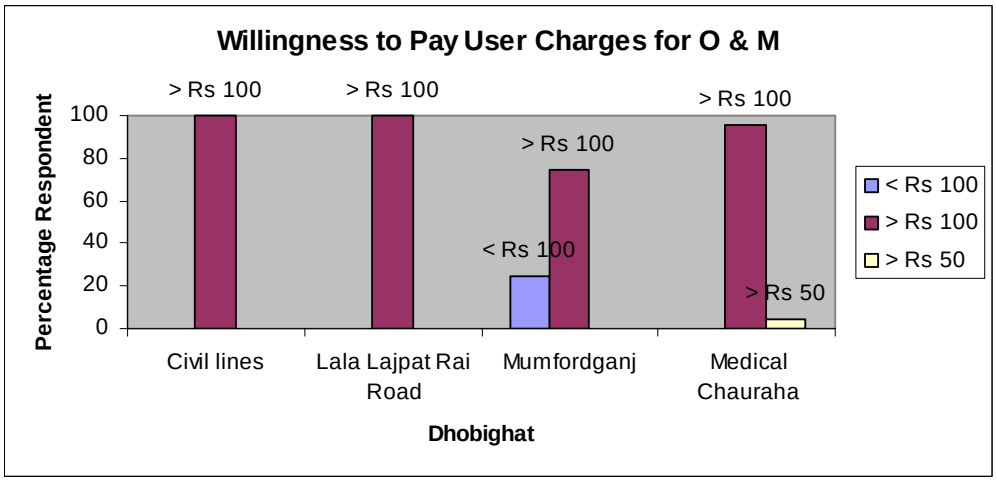
Requirements in Order of Priority

Majority of respondents have highlighted remuneration as major reason for the dissatisfaction. Availability of space was another reason. During FGDs, dhobis indicated that the dhobighats should be constructed sector wise on the basis of settlements of dhobis. They should be within the radius of one to two km so that they can save time and energy.

Willingness to Pay

Table 3.7 Willingness to Contribute for the Construction of Dhobighats

Area	In cash	In cash/shramdan	Shramdan	Grand Total
Civil lines	1	5	5	11
Lala lajpat rai road	1	4	7	12
Mamfordganj	1	2	12	15
Medical chauraha	4	1	19	24
	7	12	43	62



Observations

The O&M of the facility is done by the local Dhobi association. The number of user per Dhobighat varies from 8-25 per day. The amount of detergent used per Dhobi varies from 0.5 kg-2.0 kg per day. The Dhobis do not take any specific health protection measures either while collecting soiled clothes from households, hotels, hospitals and other establishments, or in their use of detergents and/or other chemicals.

Generally, the Dhobis carry out preliminary activities at their homes. Although the traditional practice of washing clothes by adding "ret" (alkaline soil) and putting them in a Bhatti (steam vessel) has given way to use of detergents, the formal practice is still prevalent.

The cubicles of the existing constructed Dhobighats are only partially utilized. Reasons expressed for under-utilization of the cubicles range from inadequate or uncertain supply of water to availability of more convenient alternative temporary Ghats along the river. Also, the latter proves to be more convenient as in case of some Dhobis, the constructed Dhobighats are far way from their place of residence.

No attention is paid to the aspect of conservation of water is followed; as such, the Dhobis are unaware of the environmental impact of washing clothes in the river.

Majority of Dhobis are men; women are actively involved in ironing of clothes; the literacy rate of males at 24.16 per cent is much higher than the females at 9.15 per cent.

Among the Dhobis surveyed, 40 per cent of their family members are engaged in washing clothes. In the Medical Chauraha Ghat, the average number of family members engaged in washing activities is the highest.

Majority of the respondents (70 per cent) wash less than 50 clothes per day. This is mainly related to lack of infrastructure facilities available at the constructed Dhobighats such as drying place, covered areas for taking rest etc. The largest Dhobighat is located at Mumfordganj while the smallest is located on Lala Lajpat Rai Road.

The Dhobis use low cost detergents or soda for washing clothes. The quantity of detergent used is 1.70 kg per 100 clothes. The use of cheap detergents and soda is the prime reason for associated skin diseases prevalent among the Dhobis.

More than 65 per cent of the respondents are members of their Dhobi Associations, which play a significant role in the integration of the community. It acts as the forum where Dhobis collectively address issues through a process of dialogue with the concerned local government body. It also plays a significant role in solving intra-community disputes.

There is no uniform pattern in the amount charged by the Dhobis per item of clothing washed. It varies in the range of Rs. 2 to 10. The Dhobis contend that they are unable to increase the rates beyond the present level due to resistance faced from the customers and competition from washing machines - most middle class or upper class households either use domestic washing machines or hire an individual to wash clothes at their homes.

Majority of the Dhobis are willing pay user charges for the O&M of their facilities, and also willing to make contributions in one form or the other towards construction of new facilities, or improvement to existing constructed Dhobghats

3.2.4 Summary of Findings

This section identifies the issues related to relocation/ improvements of dhobighats. The need and demand assessment of dhobis relating to new construction/ improvement relates to:

- Lack of arrangement for drying clothes
- Proper water quantity not available
- Lack of proper shed
- Lack of shelter for taking rest and food
- Lack of toilet & urinals

- No facility of drinking water
- Lack of safety arrangement or emergency health services
- No arrangement for proper disposal and treatment of waste water
- Dhobis have to stand in water of cubicles, which affects their health due to chemicals and unhygienic conditions.

It has been observed from the study that almost 75% of respondents are satisfied with the present level of facilities provided at the dhobighats.

Field Survey indicates that almost 100% respondents are willing to pay user charges for operation and maintenance of dhobighats. It can be seen from above graph that Civil Lines and Lala Lajpat Rai Road dhobis have the maximum willingness to pay and are satisfied whereas in Mumfordganj satisfaction level with present condition is lowest. The dhobis of Mumfordganj are of opinion that it is the responsibility of Municipal Corporation and other governmental agencies to provide facilities for them.

CHAPTER 4

LOW COST SANITATION PROGRAMME

CHAPTER 4 LOW COST SANITATION PROGRAMME

4.1 INTRODUCTION

4.1.1 Low Cost Sanitation (LCS)

A large population in the city is living in sub-minimal conditions in slums lacking basic amenities and services leading to the practice of open defecation on a fairly large scale. This aspect has been discussed in the earlier chapters. Houses in the slums are too small and often built on encroached lands. The highly congested localities leave no scope for construction of IHLs in most slums. Given the conditions and the poor financial status, it becomes imperative to provide LCS alternatives for the slums. In the absence of space, the only alternative left is the CTCs, which again should be cost effective and sustainable with available funds for serving the large population in the slums.

4.1.2 Constraints and Requirements

Based on findings of the preliminary survey and lessons learnt from the current scenario, many constraints have been identified in O&M of existing CTCs discussed in the previous chapter. These primarily include those pertaining to assessing the need for CTC, technical needs, O&M requirements and community aspects.

The following table presents the key factors that have to be considered and/or the necessary actions required to be taken to overcome the constraints and meet the needs of the community through the implementation of a LCS programme involving construction of CTCs, and should be considered at the planning and designing stage of the proposed programme.

Need and Location	• Demand and Need Assessment • Priority to locations/areas with greater demand for CTCs • Locating CTCs near or in a portion of the existing major open defecation ground • Average distance of the CTC from dwelling units (recommended to be ≤ 500 m)
Technical requirements	• Appropriate design in terms of number of water closets (seats) and wastewater disposal • Adequate and consistent water supply for flushing and cleaning a must • Regular electricity supply essential especially for night-time usage, and where the source of water supply is a tube-well • Feasible cost recovery of O&M costs partly or wholly through user charges – a key to long-term financial viability • Appropriate institutional framework • Balance between a financial viable larger CTC (say, a 2-seater) and multiple smaller CTCs depending on the number of residents to be served and the coverage area – single CTC located too far away will probably make the users unwilling to use the CTC.
O&M requirements	• Regular cleaning • Mobilization of required resources • Training to the caretaker(s) in managing, operating and maintaining a CTC
Community or user requirements	• Building a sense of ownership amongst the community members through an effective PP/PA programme • Participation of the community at all stages of programme implementation • Willingness to pay for using the facility • Education on use of toilets • Encouragement to women to participate in the O&M activities, which will also facilitate the PP/PA processes as women are generally responsible for managing their households

4.2 PLANNING AND DESIGNING

4.2.1 Facility Required

The design of a CTC should ensure comfortable access to all individuals in order to meet their personal needs irrespective of their background or physical condition in an easy and efficient manner. The design should maximize comfort and safety, and cleanliness, which in turn will encourage people to use them.

The essential requirements in a CTC are:

- Separate sections for male and female users
- A separate WC for physically-challenged persons and children
- Separate bathing cubicles in the male and female sections
- Arrangement for water, preferably independent tube-well with over head storage tank
- Urinals
- Basin for hand wash with mirror and towel stand
- A caretaker room
- Store room for keeping cleaning materials
- Entrance lobby
- If space is not a constraint, then development of green areas around the CTC

4.2.2 Key Planning Factors

The key planning parameters for a typical CTC are:

- Proximity to a sewer line in case of sewered areas; in case of un-sewered areas, disposal of waste water would either be to a septic tank/soak pit or into an open drain after treatment;
- Adequate power supply;
- Sufficient space for the CTC with facilities of water closets in separate sections for male and female users; power back-up; provision for physically challenged persons and children; urinals and bathing cubicles;
- The design of the facility should be able to cater to peak usage levels (2-3 hours) in the morning and evening;
- Number of WCs (seats) on the basis of not more than 30 users per WC;
- Location of CTC in such a way that the maximum distance between the CTC and the farthest dwelling unit does not exceed 500 metres;
- Well designed brick and RCC Structure with adequate drainage system;
- Good ventilation and illumination of the premises.
- Presentable and pleasing reception and lobby area.
- Round the clock water supply system for cleaning and washing essential for offering hygienic toilets facilities with overhead storage tanks.
- Caretaker room to facilitate proper and round the clock cleaning and security of the premises.
- Use of high performance interiors and exterior material and fitments for regular and rugged use of modern public toilets on the streets corners and public places.

4.2.3 Number of Users

In slum areas or residential colonies, the CTCs should preferably not have more than 20 seats, which can cater to a population of 600 persons using the facility daily. According to the primary survey results, 68.7 per cent[3] of the population in the slums surveyed are estimated to carry out open defecation. The percentage of respondents willing to pay Re. 1 or more is 23. Based on these results, it can be estimated that actual population that will use the CTC would be 15.8 per cent. This would imply that a 20-seater CTC can be located in a slum area having a population of almost 4000. It is proposed that CTCs with 5, 10 and 20 seats with standard designs are provided in slum areas.

4.2.4 Location of CTC

Prior to site selection for construction of CTC, the following assessment should be carried out.

- Existing facilities - IHLs and CTCs
- Number of households, who do not have IHLs, and the floating population that may either be temporarily residing or visiting the area
- Population that would need the facility based on the estimated number carrying out open defecation and the percentage of persons willing to pay a user charge of at least Re. 1
- Number of water closets based 30 users per seat considered to be a practical parameter as usage levels are higher in the morning hours and in late evening

The number of CTCs, one or more in a particular slum area, would depend on the concentration of the households and the average distance from the dwelling units. A distance greater than 500 metres is considered to be impractical especially in the case of women, children and physically-challenged persons.

Once number of seats and complexes are worked out, the selection of site(s) would have to consider the following factors:

- Availability of sufficient space
- Availability of water and electricity
- Availability of sewer line
- Hydrological conditions
- Acceptability of the community in consideration to different groups and the their social habits
- Environmental aspects

4.2.5 Design Criteria

Based on the above factors that need to be considered for designing a CTC, Design Criteria for CTCs with 5, 10 and 20 WCs is presented in Table 4.1.

[3] Figure arrived at by including 50 per cent of the respondents who did not provide an answer during the questionnaire survey

Table 4.1 Design Criteria for a Community Toilet Complex (CTC)

Design Factor		**No. of Water Closets (WCs) in the CTC**		
		5 WCs	**10 WCs**	**20 WCs**
No. of users	No. of users per WC per day	30	30	30
	Total users per day	150	300	600
	Total families	25	50	100
No. of bath		1	2	4
No. of urinal		0	2	4
Water Supply Requirement	Total water supply per day (45 lpcd) in kilolitres incl. bathing use	9	18	36
	Capacity of Storage tanks on the basis of 50 per cent of daily requirement in kilolitres	4.5	9	18
Electricity	Pumps (KWH per day)	2.5	5	10
	General Lighting, fans etc. (KWH per day)	5	10	20
Area requirement for the CTC with septic tank and soak pit	Single-storied structure (sq.m)	120	250	470
	Double-storied structure (sq.m)	-	200	390
Distance criterion – location of the CTC from the furthest dwelling unit		≤500	≤500	≤500

Notes:
1. If sewer connection is available the area requirement will be reduced.
2. Average family size is assumed as 6.

4.2.6 Design Alternatives for Disposal

Among the existing 111 CTCs in the city, the method of disposal of waste water into a sewer line exists in 84 CTCs while 27 CTCs dispose waste water into a septic tank.

Following three alternatives for wastewater water disposal options are discussed in Table 4.2 in terms of advantage and disadvantage. The proposed layout for CTCs is attached at Appendix L.

- Disposal into a sewer line of the existing/proposed sewerage network
- Twin-pit system (see Appendix)
- Septic tank with a soak pit
- Mini-STP

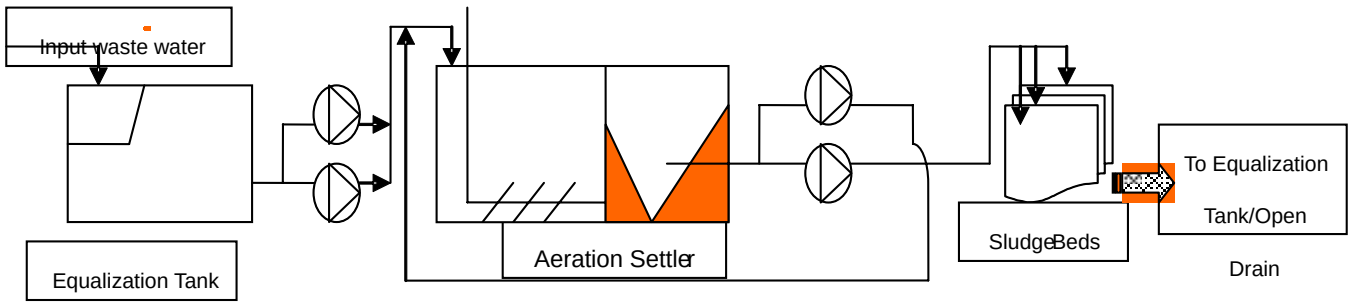


Figure 4.1 Mini-STP Treatments Scheme

Table 4.2 Comparison of Alternative for Disposal

Option	Advantages	Disadvantages
Disposal into a sewer line of the existing/proposed sewerage network	- Off-site disposal with no necessity for any on-site treatment - Best option from the environmental aspect - Reduces the burden on O&M by obviating the need for on-site disposal - No additional land requirement at the CTC location - Almost no impact on ground water pollution - **Best option if sewer is available**	- Flow generated necessitates greater slopes than normally required to ensure self-cleansing velocity - Periodic de-siltation necessary to prevent blockages - Needs a well-developed sewerage network - Low coverage of present sewerage network, and long time period required for its expansion leads to delays in meeting the sanitation requirements of the local population - Locating CTCs to provide convenient access to slum-dwellers becomes difficult
Twin-pit system	- On-site disposal - Need for emptying the pits (one pit) in 1½-2 years only - Low requirement of water (1½-2 litres) for flushing out the excreta	- **more suited for IHLs** - not suitable in soil conditions where the maximum ground water level from the bottom of the pit is less than 2 metres in case of soils with effective size greater than 2 mm – preferable to have an impervious bottom in such a situation
Septic tank with a soak pit	- on-site disposal - can be conveniently used up to 300 users per day	- de-sludging necessary at least once a year (therefore, close monitoring by ULB necessary) - chances of over-septicization if de-sludging not carried out at the required time intervals - need for multiple septic tanks for 10-seater and 20-seater CTCs - BOD levels higher than permissible levels
Mini-STP	- Re-use of treated wastewater possible for non-human contact purposes - Reduces potable water consumption - Effluent characteristics meet discharge standards - Can be effectively applied in areas where the time horizon for implementation of new sewerage network is large	- Greater requirement of electricity and therefore, susceptible to failures due to the power cuts - Greater requirement of both capital and O&M costs - More suited for local area application wherein a group of CTCs can be connected to one STP - More skilled manpower required to carry out O&M; also, O&M costs higher

Table 4.3 shows the costs of disposal options. Significantly higher capital and O&M costs are required for mini-STP, which is financially not feasible. Anticipated environmental impact and proposed mitigation majors have been outlined in Appendix M. Besides, there is a requirement of skilled manpower for O&M and the electricity consumption is higher warranting the need for stable power supply although the environmental advantage is noteworthy as highlighted in table 4.2

Table 4.3 Costs for Disposal Options

	5 WCs	10 WCs	20 WCs
1. Capital Cost			
(1) Main building	325,250	553,500	1,011,000
(2) Disposal options			
a) Sewer line	25,000	25,000	25,000
b) Septic tank/soak pit	105,000	175,000	315,000
c) Mini-STP	360,000	530,000	785,000
2. O&M Cost			
(1) Main building	4,910	5,525	7,735
(2) Disposal options			
a) Sewer connection	nil	nil	nil
b) Septic tank/soak pit (de-sludging)	350	450	600
c) Mini-STP	6,800	7,400	9,100

4.2.7 Recommendations for Wastewater Disposal

The following wastewater disposal option is recommended based on the comparison for various alternatives outlined in the previous section.

(1) CTCs should be connected to existing/proposed sewer line if nearby sewer is available; and
(2) If not available, then Septic tank/soak pit system is recommended.

4.3 OPERATION AND MAINTENANCE

4.3.1 Alternative institutional arrangements for sustainable O &M

It is important to motivate the affected communities to use the CTCs on consistent and regular basis. For this, it is imperative that the project beneficiaries perceive as well as are convinced about the crucial link between the health of their families and their other problems with the practice of open defecation, and how it can be mitigated by using CTCs.

Since the ULBs are reluctant to undertake responsibilities of O&M of new/refurbished CTCs, the other institutional alternatives for O&M are through/by:

- Private contractors
- NGOs
- CBOs/SHGs

The various options available for O&M of CTCs have been presented in a matrix form in Table 4.4 with an analysis of the pros and cons for each option.

Table 4.4 Evaluation of Alternatives for Institutional Mechanism

O&M by	Pros	Cons
Private contractors	▪ Services offered as a commercial venture; ▪ Private contractors shall ensure that the facilities are well-maintained otherwise the prospective users will not be attracted; ▪ Reduction of financial burden on the Nagar Nigam; ▪ Private contractors have the drive to make profits, which shall result in maximum utilization of resources and harnessing of opportunities to generate higher revenue	▪ Providing sanitation facilities may not be a very attractive business proposition for private contractors; may not generate adequate profits in some cases; ▪ May demand minimum usage guarantees in terms of number of users; ▪ May not be willing to take up the responsibility of O&M for long-time horizons (e.g. greater than 10 years); ▪ If venture fails, the CTC will suffer, and the situation will return to "square one"
NGOs	▪ Dedicated to focused community development activities; with profit not being their motive, the NGOs are likely to be more committed than private contractors in situations where there is huge deficit in O & M of CTCs; ▪ Can also be responsible for IEC Programme for increasing awareness on the direct link between open defecation and personal health and hygiene	▪ NGOS may not be able to carry on O & M in case there is a consistent and growing deficit in operation of CTC since most of NGOs do not have surplus income and unfunded activities; ▪ NGOs may see O & M of CTC as commercial activities, though some NGOs, specially Friends of Vrindavan, Vrindavan see this activity as furthering their environmental interventions.
CBOs or SHGs	▪ Sense of ownership; will ensure optimal utilization; ▪ Self- drive for surplus/ income generation by SHGs shall result in well maintained and working CTCs encouraging maximum usage ▪ Willingness of residents to contribute towards various activities as part of O&M can help build the ownership spirit. ▪ The availability of such ready infrastructure for revenue generation against usages shall attract several SHGs involved in income –generating urban services activities.	▪ Acceptance level low; Resistance to being associated with cleaning activities in some pockets ▪ Need "hand-holding" over initial year in respect of technical matters such as repair and maintenance works ▪ Lack of homogeneity among the slum dwellers can lead to many members resisting payment of same user charges.

Each of the options has its pros and cons. The former two are already in place for the existing CTCs although in general, the performance is unsatisfactory. The option of creating a CBO or SHG has not been attempted before. However, with CDSs already involved in activities such as savings and loan societies, minor infrastructure works etc., this option can be successfully experimented provided that there is legal and institutional support from all angles - technical and financial. Also, NGOs can be involved in the training and PP/PA activities. The role of women will be vital as they are more susceptible to diseases caused by poor sanitation. Some noteworthy examples of this approach of management of basic urban services in the economically weaker sections of the society by the community themselves are highlighted in the following paragraph.

In the rapidly-growing city of Pune in Maharashtra, the municipality's commitment to ensure that the poor have access to sanitation has produced a major example of community-driven provision of services. The municipality involved a number of NGOs in reconstructing dilapidated toilet blocks, and work contracts for maintenance of these toilets were given to members of the community. Women play a key role in these activities. This experience is being taken forward in the cities of Bangalore and Mumbai. In Mumbai, the community work of the National Slum Dwellers' Federation, and the Society for Promotion of Area Resource Centres (SPARC) has been recognised as path-breaking by the UN

Centre for Housing and Services (Habitat). Working jointly, the two Mumbai organisations have been instrumental in designing and construction of low-cost housing, developing waste disposal systems capable of reducing waste output from slums by up to 70 per cent, designing, constructing and maintaining toilets at very low costs, and sharing their best practices with other countries.

Although no single model of O&M can be applicable to all areas, the above examples demonstrate that community-driven approaches led by women have a far more positive track record than top-down ones.

4.3.2 CBO/SHG setting up

A non-conventional institutional mechanism is sought to be used for realizing the objective of the proposed project. It is suggested that O&M is handled by women-centric SHGs, who also provide urban services as a partner of ULBs. SHGs can handle urban services as an income-generating activity in addition to the usual financial services activities (savings, loan and insurance). The SHGs handle O&M of these facilities and collect levies as mutually agreed by them. Institutional measures are to be assessed based upon their expected contribution to O&M activities.

The mission of the CBO/SHG earmarked for O&M of CTC should be clearly agreed by members. For example, one such suggested mission is "Improvement of quality of lives of Members of Specific area". The goals and objectives of each such CBO/ SHG should be clearly delineated. These should include the following:-

- Regular and consistent use of CTCs by all its members
- Maintenance of the hygiene conditions and cleanliness in and around CTC.
- Maintenance of CTCs in good and usable condition all the time;
- Generation of Income from CTCs through user charges and other sources to exceed the projected O&M costs of CTCs; and
- Strive to generate surplus through use of CTC

For the finalization of the CBO structure and its institutional set-up, the byelaws shall be prepared along with consultation with stakeholders. The CBO/SHG should select a President, Secretary and a Treasurer. The role of each position should be defined so as to avoid ambiguity and achievement of its objectives.

4.3.3 Capacity Building and Training

The CBOs/SHGs face serious constraints, which are to be identified, and actions taken to overcome them. Careful analysis of constraints is becoming a hallmark of successful community development programmes. The categories of constraints are:

- Poor management skills
- Lack of technical skills related to O & M of CTCs.
- Lack of access to financial resources

The interventions are to be targeted to overcome these constraints. Following table is an indicative list of activities, which may be required for institutional strengthening of the CBOs/SHGs;

CAPACITY BUILDING ACTIVITY LIST

Definition: Capacity-building activities are undertaken to strengthen the institutional capacity of CBOs/SHGs

- Leadership training for board members e.g. conduct of meetings, conflict resolution etc.
- Develop business plans for profitable operation of economic activities like O & M of CTCs.
- Developing linkages with local, state and central government social welfare schemes
- Improving internal administrative and financial procedures (accounting, personnel etc.)
- Role definition and its monitoring
- Determination of user charges and periodic financial reviews
- Defining operating policies (i.e disbursement approvals, use of equipment, collection of user charges etc.)
- Technical capacity-building for O & M and its supervision
- Determination of benchmarks for O & M for periodic review
- Sharing /dissemination of best practices

The capacity building and training for CBOs/SHGs should be organized by NGOs/Consultants. It is recommended that a Training Centre under the auspices of Nagar Nigam in consultation with DUDA or SUDA is planned with the objective of capacity-building of members of CBOs/SHGs as well as all stakeholders. This training centre can also be equipped with a full-scale working model of a CTC (also for daily use at the proposed training centre) to facilitate hands-on training to key members of the CBO responsible for O&M.

4.3.4 Responsible Organization

Currently, several organizations, i.e., Nagar Nigam, SUDA, DUDA, NEDA etc. are implementing LCS schemes. Ideally, one single agency should be made responsible for all aspects of public sanitation to have proper control, integrated planning, implementation and monitoring.

4.3.5 Suggested Institutional Mechanism for Sustainable O & M of CTCs

The implementing agency transfers the responsibility and accountability for sustainable O & M of CTCs / Dhobhighats to PMUs in each city. The PMU shall be responsible, inter alia, for the following:-

- Construction and completion of the pilot as well as the main components of the project;
- Involvement of and ownership by communities during implementation of the project;
- Create a community apex institution which shall be responsible for sustainable O & M as well as capacity building institution for the CBOs/SHGs during and after the project is completed;
- Perform necessary monitoring and evaluation functions for successful implementation of the project with full accountability to IAs and funding agencies.
- Responsible for funds allocation and management to Training/Capacity Building Centres/ Apex body for CBOs/SHGs
- Dissemination of information about the project
- Accountable for the specific and measurable project deliverables.

In each city, the PMU shall be headed by Project coordinator with accountability to the concerned Implementing Agency in the city, State department and donor agency. The PMU shall have

representation from IA, elected representatives involving affected communities, a representative each from DUDA & SUDA, apex body of CBOs and prominent NGOs known for their contributions for promotion of health and hygiene and environmental work in affected communities.

Initially, A Training /Capacity-building Centre in each city shall be set up through concerted efforts, which shall be responsible for capacity building of CBOs/SHGs during implementation and after completion of the project on self-sustainable basis. This unit shall be headed by a competent and experienced Training Officer with capability to manage capacity-building initiatives. This unit shall also have a community mobilization specialist who shall guide and assist in creation and strengthening the CBOs/ SHGs. During implementation of the project as well as after the project is completed, this unit shall be responsible for continued awareness building, technical and managerial capacity-building as per attached institutional framework.

As the project proceeds towards completion, the management of the Training Centre shall be handed over to a newly created apex body representing CBOs / SHGs. The general body members of this apex body should have representative from each CBO. The resources created under the project shall also be handed over to the Apex body of CBOs/ SHGs.

It is recommended that this apex body is registered under Society Registration Act. This representative body shall be undertaking the responsibility for sustainable O & M after the project is completed. This unit should be able to sustain itself through mutually agreed contributions from individual CBOs, IAs and other relevant departments responsible for health, hygiene, urban development and poverty alleviations.

4.4 OPERATION AND MAINTENANCE COST RECOVERY

A sustainable O&M cost recovery model is the key to the success of any LCS Programme as capital costs (refer next section) are proposed to be from grant funds in this project.

4.4.1 Cost Estimation

(1) Capital Cost

The capital cost for the Community Toilet Complex with 5, 10 and 20 water closets with alternative design options with regard to water supply and disposal of waste water are summarized in Table 4.5.

Table 4.5 Summary of Capital Costs (Indian Rupees)

	5 WCs	10 WCs	20 WCs
Main building			
(I) Civil works	289,000	481,000	866,000
(II) Electrical works	18,250	36,500	73,000
(III) Storage tank	18,000	36,000	72,000
Total	325,250	553,500	1,011,000
Water supply options			
(a) Jal Sansthan	25,000	25,000	25,000
(b) Bore well with pump	60,000	60,000	60,000
Disposal options			
(a) Sewer line	25,000	25,000	25,000
(b) Septic tank/soak pit	105,000	175,000	315,000
Capital cost summary by disposal option			
(A) JS Water			
(I) Sewer connection	353,000	583,500	1,037,000
(II) Open drain with septic tank/soak pit	458,000	758,500	1,352,000
(B) Bore Well			
(I) Sewer connection	413,000	683,500	1,217,000
(II) Open drain with septic tank/soak pit	518,000	858,500	1,532,000
Average Capital Costs	**445,250**	**708,500**	**1,236,000**

(2) Operation and Maintenance Cost

The O&M costs for a CTC comprise costs related to electricity charges, cost of cleaning chemicals, salary and wages for the supervisors, attendants and sweepers, repairs/replacements due to normal wear-and-tear etc. Among all the cost heads, the main components are wages and electricity. The O&M cost for the Community Toilet Complex with 5, 10 and 20 water costs with septic tank and soak pit are summarized in Table 4.6. In Table 4.6, cost recovery from users is also estimated. Users of 5, 10, and 20-seater CTC have to pay Rs.276, Rs.161 and Rs.102 per family per month respectively. These amounts do not consider any subsidization such as exemption from paying electricity charges or de-sludging of septic tank.

Table 4.6 Operation & Maintenance Cost Estimate (INR per month)

Description	5 WCs	10 WCs	20 WCs
Manpower	5,000	5,000	5,000
Chemicals	300	500	900
General Maintenance	300	500	900
Electricity	945	1,575	2,835
Desludging for septic tank	350	450	600
Total	**6,895**	**8,025**	**10,235**
*Cost per family per month	**276**	**161**	**102**
*Cost per person per month	**46**	**27**	**17**
*Cost per person per day	**1.53**	**0.89**	**0.57**

*As can be observed from the above table that the cost per family/ person is on much higher side without any subsidization. The amount has been derived assuming utilization of CTCs at the rate of 30 persons per seat. The average household size has been taken as 6.

4.4.2 O & M Cost Recovery

(1) Affordability

According to the preliminary survey, the average family monthly income is estimated at around Rs.1,879. Generally, 2-4 per cent of the income (5 per cent maximum) can be spent for sanitation. Assuming 3 per cent of income can be spent for sanitation, affordable monthly charge for CTC would be around Rs.60 per household.

(2) Number of users

While working out the design, it is assumed that one seat will not be able to serve more than 30 persons as most of the users in slum areas use CTCs during two to three hours in morning and/or late evening. It is needless to say that CTCs in slum areas can not be compared with those in public places where the users turn up during all hours of the day. The average household size has been taken as 6.

(3) Cost Recovery Measures

Sustainability of the project will depend on the cost recovery models. In this project, the facilities are provided by the government and O&M costs should be recovered by users and local bodies. To recover the costs the following alternatives are studied.

Alternative 1: All the costs are recovered through user fee
Alternative 2: Electricity charge and sludge disposal are covered by the Nagar Nigam
Alternative 3: Alternative 2 plus 50 per cent of the cost of caretakers is provided through community labour

The following cases of user fee are studied.

Case 1: Rs.30 per family (1 adult in a family pays Re. 1 per day and children are free)
Case 2: Rs.60 per family (2 adults in a family pay Re. 1 each per day and children are free)
Case 3: Rs.90 per family (3 adults in a family pay Re. 1 each per day or 2 adults in a family pay Rs.1.50 each per day and children are free)

The results of financial analysis are presented in Table 4.8. The following alternatives and cases are

financially feasible.

(1) 20 WCs CTC

- Cost Recovery @ **Rs. 60** per family per month;
- Electricity charges and sludge disposal are covered by Nagar Nigam; and
- 50 per cent of manpower costs (caretaker) is covered through community labour.

Or

- Cost Recovery @ **Rs. 90** per family per month; and
- Electricity charges and sludge disposal are covered by Nagar Nigam.

(2) 10 WCs CTC

- Cost Recovery @ Rs. 90 per family per month;
- Electricity charges, and sludge disposal are covered by Nagar Nigam; and
- 50 per cent of manpower cost (caretaker) is covered through community labour.

(3) 5 WCs CTC

- No alternatives and cases are feasible.

Table 4.7 Cost Recovery Financial Analysis –CTCs

User Charge Cases		Alternative A			Alternative B			Alternative C		
	Number of WCs (seats)	5 Seater	10 Seater	20 Seater	5 Seater	10 Seater	20 Seater	5 Seater	10 Seater	20 Seater
	Monthly O & M Costs	6,895	8,025	10,235	5,600	6,000	6,800	3,100	3,500	4,300
Case 1	Cost Recovery @ **Rs. 30** per family per month	750	1,500	3,000	750	1,500	3,000	750	1,500	3,000
	Surplus/ (Deficit) required from other sources	(6,145)	(6,525)	(7,235)	(4,850)	(4,500)	(3,800)	(2,350)	(2,000)	(1,300)
	% Surplus/(Deficit)	(89)	(81)	(71)	(87)	(75)	(56)	(76)	(57)	(30)
Case 2	Cost Recovery @ **Rs. 60** per family per month	1,500	3,000	6,000	1,500	3,000	6,000	1,500	3,000	6,000
	Surplus/ (Deficit) required from other sources	(5,395)	(5,025)	(4,235)	(4,100)	(3,000)	(800)	(1,600)	(500)	1,700
	% Surplus/(Deficit)	(78)	(63)	(41)	(73)	(50)	(12)	(52)	(14)	40
Case 3	Cost Recovery @ **Rs.90** per family per month	2,250	4,500	9,000	2,250	4,500	9,000	2,250	4,500	9,000
	Surplus/ (Deficit) required from other sources	(4,645)	(3,525)	(1,235)	(3,350)	(1,500)	2,200	(850)	1,000	4,700
	% Surplus/(Deficit)	(67)	(44)	(12)	(60)	(25)	32	(27)	29	109

Notes:
1. Revenue alternatives
Alternative A: All the costs are recovered through user fees
Alternative B: Electricity charges and sludge disposal are covered by Nagar Nigam
Alternative C: Alternative 2 and 50 per cent of the cost of care takers is provided by community labour
2. User charge cases
Case 1: Rs. 30 per family (1 adult in a family pays Re. 1 per day and children are free)
Case 2: Rs. 60 per family (2 adults in a family pay Re. 1 each per day and children are free)
Case 3: Rs. 90 per family (3 adults in a family pay Re. 1 each per day or 2 adults in a family pay Rs.1.50 each per day and children are free)
3. Financially feasible option

4.4.3 Conclusions and Recommendations

- Cost recovery at prevailing monthly rates of Rs. 30 per family are totally un-remunerative as they do not even cover subsidized costs for all types of CTCs.
- A minimum charge of Rs. 60 per household per month (20-seater CTC) is required to be levied for sustainability.
- 5-seater CTCs are not viable from the point of sustainability of O&M, and therefore not recommended.
- Part of the costs - electricity costs and sludge disposal costs should be borne by the Government considering the social and environmental importance of this project.
- Part of the manpower costs for caretakers should be shared through community involvement such as contribution in carrying out regular O&M works.
- Manpower costs should be minimized by sharing of O&M activities through allocation of duties amongst the members (of the CBO) on voluntary basis.

It is further recommended that full cost recovery of O&M can be facilitated through the following policy interventions:-

- Strict and disciplined enforcement of regulations by ULBs against defaulters in respect of defecation at places other than CTCs; and
- Imposition of market induced user charges and generation of income from other sources by the CBOs/ SHGs as part of their income-generation urban services activities such as
  - User charges per visit from non-community members;
  - Income form hoardings/ advertisements from private parties;
  - Community mobilization charges from local, state and central development agencies

4.5 SOCIAL AND ECONOMIC BENEFITS

This section deals with the social and economic benefits of community toilet complexes.

According to the World Health Organisation (WHO) and the United Nations Children's Fund's (UNICEF) Global Water Supply and Sanitation Assessment 2000 Report, 2.4 billion people did not have access to any sanitary means of human waste disposal. The consequences are devastating. This is a major cause of diarrhea and disease, which claims 2.2 million deaths annually, many of them young children as per Gender and Water Development Report 2003.

Providing access to sanitation facilities, though relatively inexpensive, could halve the death toll among those who do not currently enjoy this fundamental human right. The incidence of infectious diseases is four times higher in India than in China, despite India's higher per capita expenditure on health. In India, millions of people live in slums and squatter settlements that are latticed by ditches clogged with faeces, rubbish and fetid water.

This project shall generate intangible benefits that are more difficult to express in monetary terms. These benefits can be conveniently classified in the following groups:

(1) Environmental benefits:

The construction of all CTCs envisaged under the project is expected to reduce the pollution indirectly caused by open defecation. The project shall generate important health benefits and positive environmental externalities. This project also targets poverty reduction through raising the living standards of the poor and environmental protection and improvement. The surrounding areas for the local communities are likely to improve with the absence of incidence of open defecation.

(2) Economic Benefits:

Economic benefits include productivity gains, secondary economic benefits and developmental impact due to improved health and lower incidence of water –borne diseases. This project shall ensure access to quality services for the urban poor and the affected communities at affordable prices. Besides, the project shall provide self-employment and income-generating opportunities to several community members especially women members of Self-help Groups.

(3) Health-related benefits:

Experience shows that inadequate water and poor sanitation aggravates poverty in urban areas, as the poor are forced into a vicious cycle where they have to spend their limited resources on health-care to treat water-borne diseases, a major cause of mortality and morbidity throughout India. This project is expected to reduce the incidence of diarrhoea resulting from poor sanitation and hygiene and responsible for the death of impoverished children each year in the communities;

(4) Social or equity benefits:

These include gender, regional and income-related equity. Where there are no toilets, girls commonly avoid school; without access to toilets women and girls must wait until it is dark to defecate, exposing themselves to harassment and sexual assault. In an era of increasingly competing demands for water and other resources and services, the key is de-centralized management, especially by women's groups. This project shall empower the women's groups and assist in improved earnings for the communities.

(5) Institutional benefits:

The project is expected to strengthen the CBOs/SHGs through capacity–building in areas like financial management and contract management, and lead to empowered community organizations;

4.6 IMPLEMENTATION OF PROPOSED PROGRAMME

4.6.1 Estimation of number of Community Toilets Complexes required

(1) Estimation of number of Community Toilets Complexes required

Need assessment for toilets in slums in Allahabad has been carried out on the basis of findings of the primary survey and data from JICA Study Reports, DUDA and Nagar Nigam. The requirement for CTC has been calculated for the population practicing open defecation combined with willingness to pay for the usage of CTC facility. As per the analysis of primary surveys, almost 68.7 per cent of the respondents practice open defecation in Allahabad, which is the target group for which CTCs have to be proposed for restricting open defecation.

One Rupee per usage has been considered as a benchmark for calculating the willingness to pay for a sustainable O&M model for CTCs. It has been found from the primary surveys that about 23 per cent of the target is willing to pay Re. 1 or more per usage. Total slum-wise population for Allahabad has been updated based on information from various secondary sources including Nagar Nigam and DUDA data. One seat for every thirty persons has been considered as norm for calculating the number of seats required for the target group. The proposed CTCs have been categorized into two categories - 10 seater and 20 seater, which for Allahabad has been calculated as 95 and 14 respectively adding up to a total of 109 CTCs. The slum-wise CTC requirement for Allahabad city has been provided in Appendix K.

(2) Rapid Survey for Availability of Land and Utilities for CTCs

To confirm land availability and existing utilities (water supply, electricity and wastewater disposal) near the proposed site for CTC, a rapid sample survey to collect the following information was conducted. The questionnaire is attached in the annex.

- Approximate population
- Existence of CTC
- Proposed sites for CTC (250 Sq mtr in case of 10 seats)
- Current status of the land
- Current source of water supply in the slum
- Electricity supply
- Wastewater disposal
- Site map

26 slums were selected for the rapid survey in the slums that preliminary survey was done. The results of the survey confirmed that 16 slums expressed the needs of CTC and land is available in 15 slums In 3 slums demand for CTC were not confirmed. The results of the survey are attached in the annex.

4.6.2 Programme Implementation Strategy

(1) Project Implementation Concepts

As highlighted earlier, the foremost constraint with regard to CTCs is O&M activities. The O&M by private contractors and NGOs are already in place for the existing CTCs although in general, the performance is unsatisfactory.

The proposed LCS programme to improve slum sanitation adopts a needs-driven and community-driven approach in planning, implementing, operating and maintaining CTCs and it is proposed that the O&M of CTCs is facilitated through local CBOs/SHGs. However, the creation of a CBO/SHG for O&M of CTCs has not been attempted before. Therefore, the JICA Study Team recommends that a pilot project to manage CTC through CBO be implemented and a good example or model for O&M of CTC be created before implementing full-scale project. This model project can then be extended to full-scale projects.

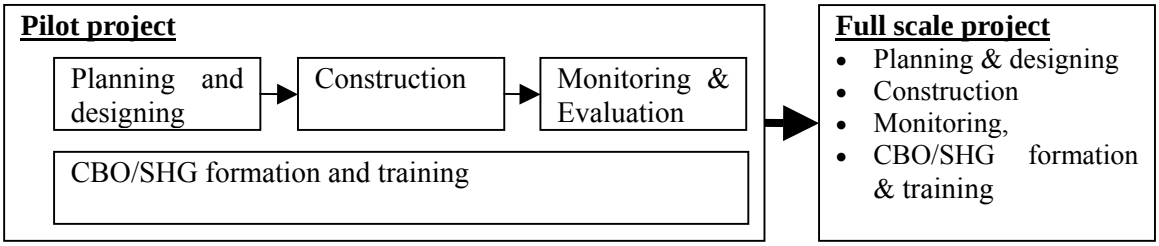


Figure 4.2 Programme Implementation Strategy

(2) Institutional Setting Up for Monitoring

The proposed institutional set-up is graphically presented in Figure 4.3. Nagar Nigam being the main body responsible for health and hygiene should regularly monitor the functioning of the CTCs within Municipal limits. It should interact with the coordination committee, which should consist of elected members of the community and representatives of the Health Officer of the Nagar Nigam. This committee will discuss the problems of the community in respect of the CTC(s) in an area and try to solve them. This will also provide an opportunity to the Nagar Nigam to obtain feedback on the experience of the community supervisors of the respective CTCs. Each CTC will be supervised by the community itself, while the O&M will be done by members/volunteers from the community.

Supervision and monitoring can be also be carried out through Women Watching Groups (WWGs). These monitoring activities will have to be carried out in coordination with the proposed activities of Public Participation and Awareness for non-sewerage schemes, which is discussed in the separate chapter of this report.

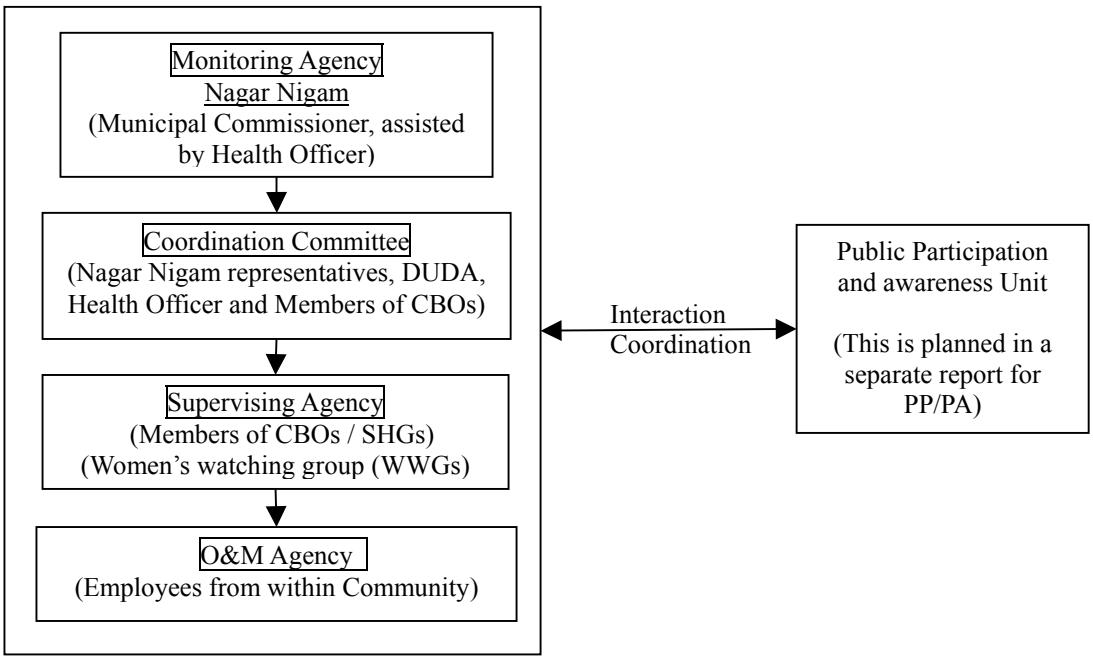


Figure 4.3 Proposed Institutional Set Up for CTC Monitoring

(3) Programme Monitoring

After completion of construction of the CTC and setting up the required institutional framework, the pilot has to be monitored regularly to test the efficacy of the proposed system, the community response etc. It must be allowed some time to enable the assessment of its full impact and PP/PA exercise must continue in full vigor. Any meaningful evaluation would be available only after a few months. The monitoring and evaluation of the pilots will provide the basis for judging the suitability for replication.

The evaluation of performance should be done against a checklist and anticipated responses. The deviations will need to be carefully recorded and appraisal carried out. It is quite possible that the feedback received from the two pilots will be different. This will provide a sound basis for assessment. The common short comings noticed can be kept in view for corrective actions in full scale projects. Variations in the findings of the two pilots will need to be examined with reference to their specific locations, which in turn will provide insight into the kind of expectations the different communities might have. This would form the starting point for making changes for specific locations.

(4) Programme Implementation Procedure

The proposed Programme will be implemented through following steps.

- Step 1: Slum Survey
- Step 2: Creation of CBOs/SHGs
- Step 3: Planning and designing
- Step 4: Selection of location of CTC including land acquisition clearance
- Step 5: Construction
- Step 6: Training of CBOs/SHGs

- Step 7: Operation & Maintenance
- Step 8: Monitoring, Evaluation and Learning
- Step 9: Feed back

Following information in slums will be required for detailed planning of CTC facility and O&M:

- Socio-economic situation (population, number of household, average wage, etc)
- Existing infrastructure
- Existing water supply mode and its status
- Existing sanitation mode and its status
- Need for CTC, willingness to pay, willingness to participate
- Health standards
- Housing and availability of land
- Characteristics of the community
- Awareness level

Following information collection tools are proposed for surveys:

- Secondary data collection
- Questionnaire survey
- Focus group discussion (FGD)
- Mapping
- Transect walk
- Workshops

(5) Operation and Maintenance Plan

Considering the O&M costs in light of the poor capacity of the users to pay for the services, the ULB and the CBO/SHG should jointly share the responsibility to "run" the CTC. The local body should subscribe to the deficit amount after accounting for the resources that can be generated through contributions from the beneficiaries.

The day to day O&M can be entrusted to CBO. In any case, the local community should be involved in O&M as a monitoring and evaluation body.

Guidelines for the following are Appendix O:

- Supervision of construction
- O&M
- Users of the CTC
- Monitoring and Evaluation of O&M by ULB

(6) Public Participation and Awareness for LCS Programme[4]

The Consultants recommend that the proposed IEC programme is carried out by CDSs/"Samudai Vikas Samitis" with the close assistance of Nagar Nigam in three phases as a process running parallel to the proposed pilot projects. The involvement of voluntary groups and school children will also be vital. The particulars mentioned in the following sections refer primarily to LCS programmes, although the basic structure of PP/PA framework can be used, with certain modifications for the constructed Dhobighats.

[4] PP/PA programme for Non-sewerage scheme and its project cost estimation are also discussed in Part III, Public Participation and Awareness.

Inculcating the sense of ownership and ensuring proper operation and maintenance are key to meeting the stated objective of cleaning Ganga and her tributaries; The ultimate objective of the PP/PA programme should be to raise the consciousness to a level where inhabitants begin to demand their rights and carry out their duties without external impetus and move towards a regime of self-help.

With more and more migration of the rural poor expected to take place in the future in search of a livelihood, the habit of open defecation may continue even after adequate toilet facilities are created in different areas. Therefore, there is a need for propagating the hygiene virtues, making PP/PA a continuous process and it should begin with young children - best way to educate is to catch them young - and women.

Phase I – Awareness for needs and design (Pre-Construction Phase)

Inception Workshops should be organized at the community level to explain the objective and benefits of the LCS programme. Workshops should clarify roles and responsibilities of different stakeholders, and the key elements of the LCS programme such as the lay-outs, construction material, and importance of treatment of waste water before disposal, and O&M issues, akin to an "orientation" programme. Topics should be designed in a manner that they encourage participation of all sections of the stakeholders. The target group would include persons of all age groups, women and children; vulnerable sections must be given special attention. The programme should cover the following aspects:

- Problems of arising from "un-sanitary" conditions, such as adverse impact on health and the vicious cycle of poverty, pollution and ill-health.
- Initiatives that would help in improving the living conditions through improved sanitation i.e. long term benefits of health , better earnings and living standard;
- The need to keep one's environment clean.
- Rationale behind the proposed action plan must be explained and their objections and fears looked after. The inputs received from the community can form the basis of initiation and content of PP/PA programme.
- After the initiation, different groups may be formed to enable special job-oriented training being imparted to the persons selected for various tasks such as manager, operator and office bearers of the CBO.

Community-Based Organizations (CBOs) would need representation of both the elders/community leaders, who are looked up to as well as the youth for guiding them to the path of better living. CBOs are expected to not only function as managers of CTCs, but also as multipurpose societies. One of the major objectives may be to act as credit societies, which can help setting up small business as avenue for income generation. CBOs can involve some of the semi-trained/trained residents, and pay them service charges for routine management and maintenance work. Those at lower rung of ability and education can be appointed for cleaning, gardening and other simple activities and earn a reasonable income.

Phase II - Training - a participatory approach (Construction Phase)- 2 months

This phase runs parallel to the construction phase, and continues after the construction activities are completed, wherein people's participation in the entire process is further encouraged or strengthened by stressing on issues related to hygiene, "right" sanitation practices etc. This will focus on training of trainers -mostly community workers. They should be given special orientation in PR work and behavioural aspects of communities and hands on training for use of various training tools. This training should ideally be imparted by experts in group psychology and organisational behaviour. It will involve:

- Formation and training of women's groups - recent success stories have shown that women play an important role in the creation of Self Help Groups (SHG);
- Audit of CTC construction;
- Developing CTC not merely a place for public "conveniences", but as a centre of community activities with various allied facilities such as a community centre with some basic recreation facilities, landscaping etc.;
- Environmental education for school children;
- Hygiene assessment and "collective" action.

This phase could also be utilised for selection of managers, operators from among the literate/educated members and formation of formal CBO.

Phase III - Final Phase (Operation and Maintenance)- 5 months

This phase should have a separate module for prospective managers, operators and supervisors etc. training would include lessons in running repairs, trouble shooting, efficient O&M practices, simple account keeping , handling of chemicals and cleaning agents and approach to improving ambience. They should also be given insight into topics like water /hydrological cycle and need to conserve water, water borne diseases, causes and their prevention, cost benefit aspects of sanitation, environmental issues and ambience of neighbourhood.

It is expected that by the time the third phase begins, the construction process of CTCs would either be near competition or would have been completed in certain areas. For the community as a whole, Phase III should be treated as a continuation of PP/PA programme and cover, inter alia, formal and informal education, , vocational training to help setting SMEs, or jobs in them; issues like housing and development, drainage, electricity, water, rights and duties leading to empowerment and welfare possibilities and gender bias. The emphasis of this phase would be on the following aspects:

- Maintaining cleanliness of CTC;
- Prudent usage and conservation of water;
- "Dos and Don'ts" of using the sanitation facilities;
- Need to assist O&M regime;
- Be role model for other communities.

This section relates to mechanisms in assessing the various components of the ongoing programme to ensure effectiveness and efficiency.

(7) Monitoring, Evaluation and Learning (MEL)

LCS Programme

Based on the guidelines suggested in this report, the implementing agency should develop a mechanism for MEL considering the following aspects:

- It has to be an ongoing process – assess the situation, analyse it, take corrective measures where necessary and record the same as part of the lessons learnt;
- Follow-up on the above to ensure that the members of the CBO are learning from successes and mistakes;
- Implementation plans should be prepared on an annual basis; the process should incorporate quarterly, half-yearly and annual assessments besides regular fortnightly visits to enable trouble-shooting; the intermediate assessments will also facilitate revisions to the implementation plan wherever necessary;
- The reports should be delivered to the responsible departments/agencies at city/district/state government/central government levels as well as the funding agency; this process will facilitate any initiatives that may become necessary at legal or policy levels;

Table 4.8 Items to be Monitored

Data requirement	Frequency of data collection	Data collectors
Increase/decrease of number of households using CTCs	Quarterly report	CBO/SHG
Power supply	Monthly report	CBO/SHG
Water usage	Monthly report	CBO/SHG
Presence of caretaker any time of the day	Monthly Women's watch group report (WWG)	CBO/SHG
Regular presence of cleaner	Monthly Women's watch group report	CBO/SHG
Odour	Monthly Women's watch group report	CBO/SHG
Willingness to pay for use	Payment register	CBO/SHG
Recurring Monthly maintenance expense	Stock register	CBO/SHG
Maintenance of stock register for cleaning material	Random cross-checking	Implementation Agency (CBO/SHG)
Monthly internal review meetings to assess the situation of operation and maintenance		Implementation Agency (CBO/SHG)
Quarterly review meetings to assess the situation of operation and maintenance		Local body, Community representatives
Corrective actions taken	Monthly reporting internal and external as appropriate	CBO/SHG

Public Participation and Awareness

The implementing agency should develop a monitoring and review system in order to make an ongoing assessment of the programme and take action where necessary. Stepping back from time to time will allow the facilitators to ask questions and ensure that they are learning from successes and mistakes. In this context, annual planning, regular monitoring and reporting, assessment, annual and mid-term reviews, and programme revision, if appropriate, are important management tools.

The project activities – PP/PA which are for a fixed period of one year should be evaluated mid term and end term. The programme should be evaluation as per the objectives of the project. Table given below provides an indicative list of indicators for evaluation of PP/ PA programme:

Table 4.9 Items to be Monitored and Evaluated for PP/PA programme

Effect	Indicators
Improvement in general health	• Money spent on medications/ physicians for health problems related to vector and water borne disease.
Higher level of awareness on health and hygiene in comparison to the situation before the PP/PA	• Increased demand for CTCs • Increased demand of IHLs • Decrease in open defecation • Increase in water consumption for personal hygiene. • Demand for bathing facilities • Concern over general hygiene conditions among family members
Increased awareness, knowledge about environmental conservation.	• Decrease in littering • Decrease in burning leaves and garbage • Increase in burial of biodegradable waste • Decrease in wastage of water • Decrease in cutting of trees
Improvement in general cleanliness of habitat	• Decrease in disposal of garbage in drains • Alternate garbage disposal mechanisms. • Cleaner pavement • Decrease in use of open drains as urinals and toilets • Restricted movement of cattle (if any) • Decrease in littering of food waste
Higher demand of Municipal support	• Spraying of insect repellant • Regular lifting of garbage • Sweeping of lanes • Clean water supply • Cleaning of Septic tanks and sewer (if any) • Reporting municipal irregularities to higher authorities
Reflection of higher self esteem among women	• Increased demand for IHLs/CTCs • Demand for adequate bathing facilities resulting in privacy
School children as agents of change	• Averse to open defecation • Propagation of ill effects of the same at home • Developing of hygienic habits • Trying to inculcate the same among family members and peer group • Sensitive to apathy towards health and hygiene issues
Elderly as guardian of society	• Active participation in awareness campaign. • Act as opinion leaders during social functions • Influence children to develop hygienic habits

(8) Requirements for Feasibility of CTC Programme

The evaluation of feasibility of setting up a CTC at a particular location is proposed on the basis of a feasibility matrix that will consider the following factors:

- Availability of land
- Sewage (waste-water) disposal system
- Water supply
- Electricity supply

To identify and evaluate the above factors, and promote planning and training, consultants/ NGOs

should be hired for the following purposes:

- To assist finding needs and demands
- To plan and design facility
- To assist forming CBO/SHG
- To train CBO/SHG
- To assist monitoring and evaluating CTC Programme

(9) Feasibility Matrix

The feasibility matrix evaluates the feasibility of setting up a community toilet complex (CTC) at a particular location on the basis of the factors mentioned hereinabove. By allotting a maximum feasibility score of 5 to each of four factors (as underlined), a scale from 0 to 20 evaluates the feasibility of the proposal to determine whether the project is immediately feasible (high priority), feasible after taking certain specific actions (medium/low priority depending on the length of time required to take the suggested actions), and un-feasible. The following examples illustrate this categorization:

- A clear space without any encumbrances and belonging to the project implementation agency satisfying the area and distance criteria (see table) is allotted a maximum feasibility evaluation score (FES) of 5. Waste water disposal into the existing underground sewerage or open storm water drainage system will respectively contribute 5 and 4 points to the FES. Provision of bore-well for water supply and back-up generator facility will contribute 3 points each to the maximum feasibility score. This leads to a total score of 16/15 points out of 20.
- If the land identified is in the realm of private ownership and is not free from encumbrances, then the practical difficulties involved in acquiring such a piece of land render the location un-feasible, and obviate the need to evaluate the other feasibility factors. In fact, the key factor is availability of land while the other hindrances can be tackled by making suitable investment decisions.

The immediate feasibility (high priority) of the proposed CTC can be considered if the minimum contribution of each feasibility factor to the FES is as follows subject to a total minimum score of 13:

- Availability of land = 4
- Sewage disposal system = 3
- Water supply = 3
- Electricity supply = 3

The medium/low priority projects will require a minimum score of 8 and can be considered as feasible if the minimum contribution of each feasibility factor to the FES is as follows:

- Availability of land = 1
- Sewage disposal system = 2
- Water supply = 3
- Electricity supply = 2

The matrix outlined in Appendix P is primarily a decision making tool, and is expected to be applied once the need-and-demand assessment has been completed. It is recommended that those areas, wherein residents demonstrate a greater desire to self-manage the CTCs, and willing to pay user charges should be accorded high priority.

4.6.3 Total Programme Cost of Proposed Community Toilets Complexes

The total capital costs for proposed CTC for Allahabad has been calculated as Rs. 84.6 million, the details of the same are given in the following table.

Table 4.10 Cost Details of CTCs Required for Allahabad City

Type of CTCs	Cost per CTC(In Rs)	No of Proposed CTCs	Total Cost(In Rs)
10 Seater	708,500	95	67,307,500
20 Seater	1,236,000	14	17,304,000
Total Capital Cost			84,611,500 say **84,611,000**

4.6.4 Implementation Schedule for CTCs

The estimated total project duration, including planning/design and construction phases is six months. However, it is expected that the MEL activities will span a longer period of time. The details of the implementation schedule are given in the following table:

Table 4.11 Proposed Implementation Schedule

Activity	Month							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Need survey								
2. Identification of location for CTC								
3. Detailed Design & Engg Studies								
4. Construction								
5. Evaluation								
6. CBO formation and PPPA activities								

Note: PPPA activities are planned in the different volume of report.

4.6.5 Preliminary Implementation Cost for CTCs

Based on following assumption, the total project costs with a yearly break-up (2007-2011) is presented in table below. Total project implementation cost will be Rs.105 million.

- The project duration is 5 year staring in 2007;
- Physical contingency is 5 per cent of the capital cost;
- Consulting and engineering costs is 10 per cent of the capital cost;
- Project Administration costs is 10 per cent of the capital cost;

Table 4.12 Total Implementation Cost with Yearly Break-up

Allahabad	Year				
	2007	2008	2009	2010	2011
	Pilot Project	Full Scale Projects			
No of construction of 10 seater	2	23	23	23	24
No of construction of 20 seater		4	4	4	2
Capital Costs	1,417,000	21,239,500	21,239,500	21,239,500	19,476,000
Physical contingency (5%)	70,850	1,061,975	1,061,975	1,061,975	973,800
Consulting and Engineering Costs (10%)	141,700	2,123,950	2,123,950	2,123,950	1,947,600
Project Administration Costs (10%)	141,700	2,123,950	2,123,950	2,123,950	1,947,600
Total	1,771,250	26,549,375	26,549,375	26,549,375	24,345,000
					105,764,375

4.6.6 Pilot Project

As proposed earlier in this chapter, since considerable new ground will need to be covered, two pilot projects should first be built, evaluated and used for a successful model case.
Based on the baseline surveys and need assessment, Consultants have identified some two possible locations where pilots can be considered. These locations are:

(1) Kasari Masari
(2) Salori Malin Basti

These locations have been short listed on the basis of the need assessment and willingness to pay.

(1) Pilot Study Site: Kasari Masari

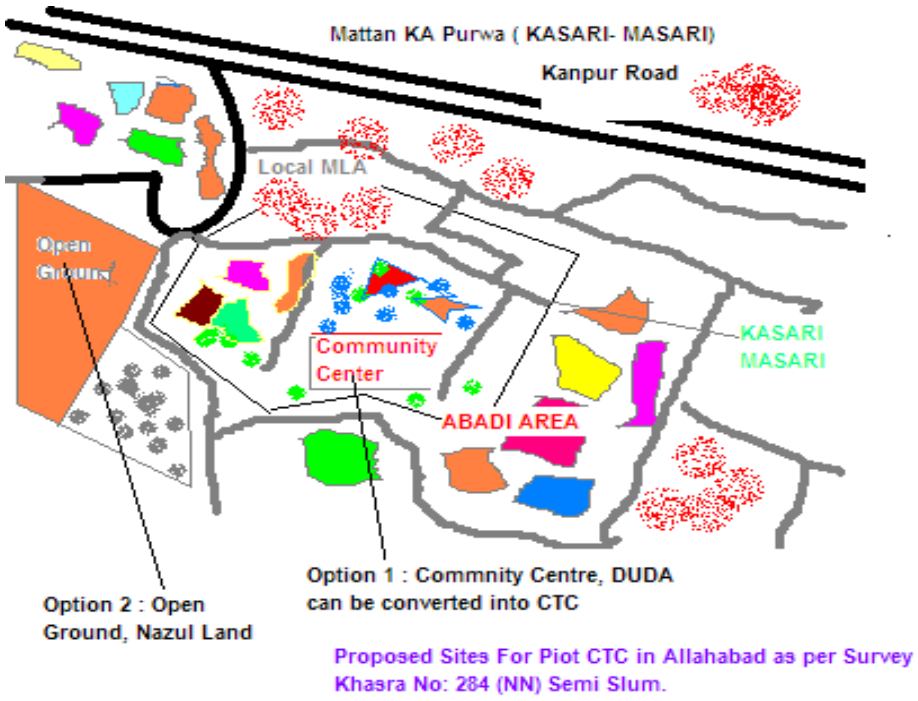


Table 4.13 Feasibility Matrix for Kasari-Masari Pilot Project

Feasibility Factor	Maximum Feasibility Evaluation Score (FES)	Check List	Existing Status	Proposed Action
Availability of Land	5	✓ Ownership of the space or area identified ✓ Land free from all encumbrances ✓ Adequacy-of-area criterion – adequacy of space for the construction of a community toilet complex (CTC) comprising the number of toilet seats determined on the basis of demand-and-need analysis ✓ Farthest-distance criterion – the distance between the farthest dwelling unit in the area covered by proposed CTC does not exceed 500 metres	• Land belongs to DUDA/Nagar Nigam • CTC proposed at the location of the existing Community Centre; Build a two-storied structure with a CTC at the ground floor level and the community centre at the first floor level, or at the present open ground used for defecation • The two criteria of adequacy-of-area, and farthest-distance are satisfied	• Allot 5 points to the FES • Proceed to evaluate the next feasibility factor
Sewage (waste-water) disposal	5	✓ Location of the closest point on the existing sewerage system ✓ Location of the closest point on the existing open storm water drainage system ✓ Soil conditions and ground water status	• The cost of construction of an on-site waste-water disposal system is lower than the cost of laying a sewer line as no sewerage system exists within the area	• Evaluate the feasibility of setting-up an on-site waste-water treatment and disposal system considering the existing soil and ground water conditions
			• Existing soil and ground water conditions considered suitable for setting-up an on-site waste-water treatment and disposal system comprising a septic tank and a soak pit	• Choose the option of on-site waste-water treatment and disposal system comprising a septic tank and a soak pit • Allot 3 points to the FES • Proceed to evaluate the next feasibility factor
Water and Electricity Supply	5, 5	✓ Availability of water either through piped supply or through bore-well ✓ Availability of electricity through normal city supply or diesel generator set	• Piped water supply is available, but not adequate • Adequate electricity supply is available	• Provide for bore-well and pumping arrangements to supplement piped water supply; Allot 4 points to the FES • Allot 5 points to the FES • Allot 5 points to the FES

The feasibility evaluation shows a score of 18, which points to high priority and can therefore be taken up. According to the primary survey, the number of WCs (seats) required in the CTC is 10.

(2) Pilot Study Site: Salori Malin Basti

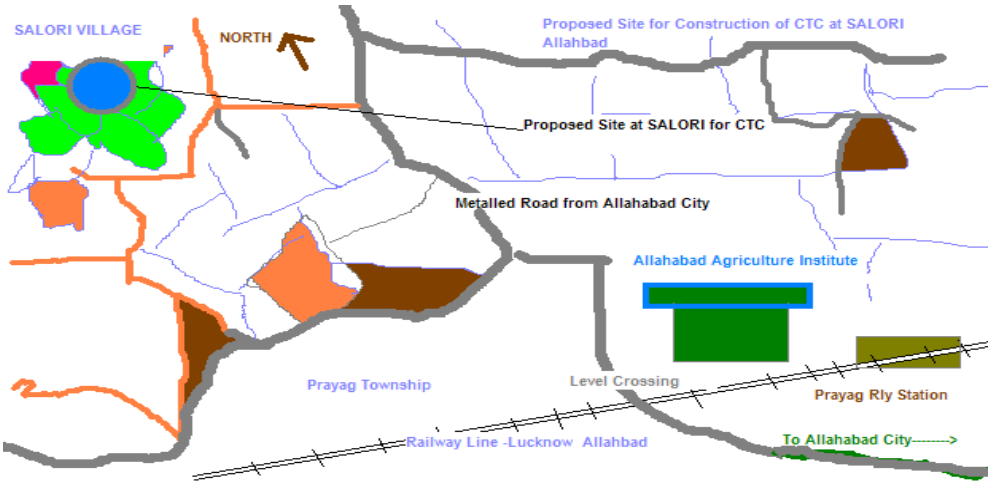


Table 4.14 Feasibility Matrix for Salori Malin Basti Pilot Project

Feasibility Factor	Maximum Feasibility Evaluation Score (FES)	Check List	Existing Status	Proposed Action
Availability of Land	5	✓ Ownership of the space or area identified ✓ Land free from all encumbrances ✓ Adequacy-of-area criterion – adequacy of space for the construction of a community toilet complex (CTC) comprising the number of toilet seats determined on the basis of demand-and-need analysis ✓ Farthest-distance criterion – the distance between the farthest dwelling unit in the area covered by proposed CTC does not exceed 500 metres	• Land belongs to DUDA/Nagar Nigam • CTC proposed at the present open ground used for defecation • The two criteria of adequacy-of-area, and farthest-distance are satisfied	• Allot 5 points to the FES • Proceed to evaluate the next feasibility factor
Sewage (waste-water) disposal	5	✓ Location of the closest point on the existing sewerage system ✓ Location of the closest point on the existing open storm water drainage system ✓ Soil conditions and ground water status	• The cost of construction of an on-site waste-water disposal system is lower than the cost of laying a sewer line as no sewerage system exists within the area	• Evaluate the feasibility of setting-up an on-site waste-water treatment and disposal system considering the existing soil and ground water conditions
			• Existing soil and ground water conditions considered suitable for setting-up an on-site waste-water treatment and disposal system comprising a septic tank and a soak pit	• Choose the option of on-site waste-water treatment and disposal system comprising a septic tank and a soak pit • Allot 3 points to the FES • Proceed to evaluate the next feasibility factor

Feasibility Factor	**Maximum Feasibility Evaluation Score (FES)**	**Check List**	**Existing Status**	**Proposed Action**
Water and Electricity Supply	5, 5	✓ Availability of water either through piped supply or through bore-well ✓ Availability of electricity through normal city supply or diesel generator set	• Piped water supply is available, but not adequate • Adequate electricity supply is available	• Provide for bore-well and pumping arrangements to supplement piped water supply; Allot 4 points to the FES • Allot 5 points to the FES • Allot 5 points to the FES

The feasibility evaluation shows a score of 18, which points to high priority and can therefore be taken up. According to the primary survey, the number of WCs (seats) required in the CTC is 10.

CHAPTER 5

CONSTRUCTED DHOBIGHAT PROGRAMME

CHAPTER 5 CONSTRUCTED DHOBIGHAT PROGRAMME

5.1 PLANNING AND DESIGNING

5.1.1 Key Planning Factors

The findings of the primary survey and the lessons learnt thereof on the existing scenario of traditional/constructed Dhobighats in Allahabad identifies the shortcomings in the ongoing construction Dhobighat (DG) programme, the constraints faced with regard to design and O&M and the key factors that have to be considered for successfully implementing a constructed DG programme involving construction of new Dhobighats/rehabilitating the existing ones.

Key Factors
- The demand-and-need assessment for the facility(ies)
- Collective ownership for O&M with clear cut formulation of roles and responsibilities for the users and project implementation agency(ies)
- Formation/strengthening of Dhobi associations to build in conflict resolution mechanisms; for the development of an understanding on the importance of self-management of the facility for a sustainable livelihood within the group; for the participation of the users in planning, design and project implementation stages; for assisting the Dhobis in becoming financially independent; and for the development of leaders who can provide direction to the association

The key planning parameters are:
- Number of Dhobis estimated to use the proposed facility/are using the existing facility
- Average distance of the residence of Dhobis from the Ghats
- Number of existing traditional DGs, and possibility of providing of one or more constructed DGs as a common facility for the present users of the traditional DGs
- Existing relationship, if any, between the Dhobi associations at different DGs0
- Availability of land
- Availability/requirement of water and electricity
- Disposal of used water

Technical appropriateness of the design would depend on factors listed below. Therefore, the implementing agency should take into account these factors in the best of their ability to design a technically appropriate option for DGs.

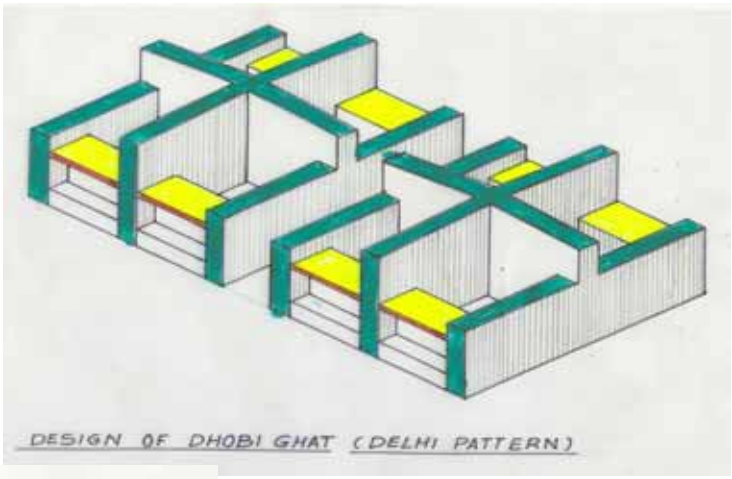
- Cultural acceptability
- Environmentally safe and user friendly (Design should match the method of working of the Dhobis to the extent possible. If changes are necessary, then the PP/PA programmes will require to mobilize the Dhobis to adapt themselves to the changes with particular emphasis on the benefits of these changes for environment protection in general, and their personal health and hygiene in particular)
- Adequate and consistent availability of water
- Affordability
- Usage in a day
- Land availability
- Legal clearances
- Occupational hazards
- Space requirement for each Dhobi (while washing clothes)
- Type and permeability of soil, if on-site sanitation disposal is warranted.

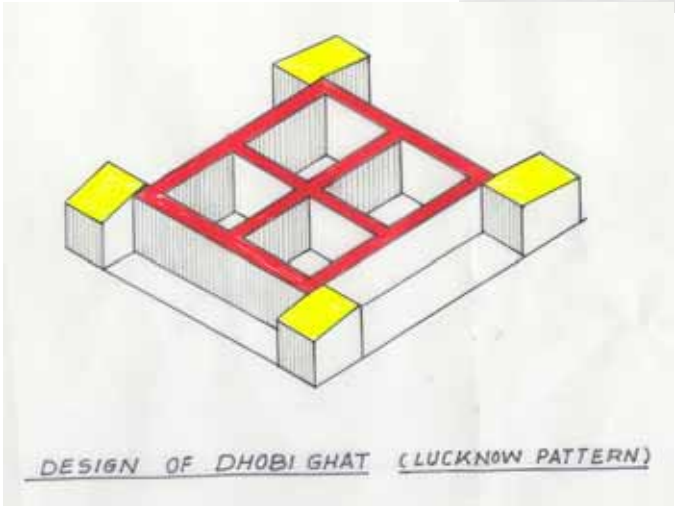
5.1.2 Design Alternatives

Based on single cubicle:

(a) Dhobi stands inside the cubicle:

- Dhobis stands inside the cubicle while washing clothes.
- While doing so, the Dhobi has to stand in polluted water for long periods, which not only is harmful to the skin but also may affect the general efficiency.
- Also, the design in itself is inconvenient as the Dhobi has to jump over the platform to get into the cubicle.



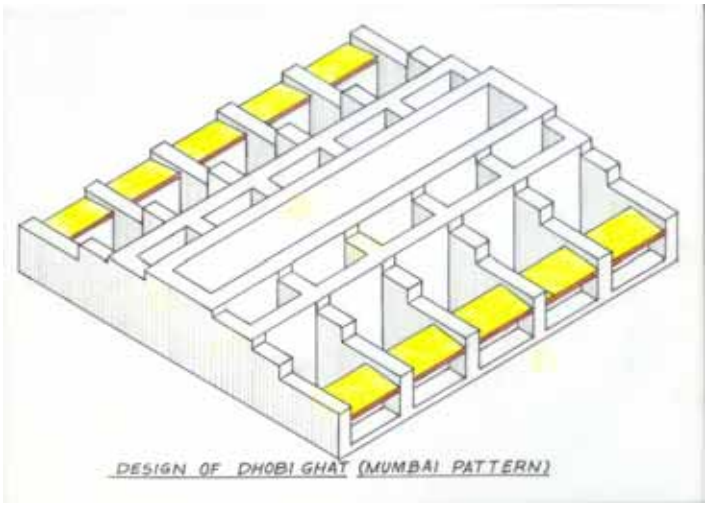


(b) Dhobi standing outside the cubicle: this option obviates the impact of having to stand in water containing washing chemicals

In both (a) and (b), the Dhobi first washes clothes by beating them on the platform and then empties the cubicle and fills it with clean water for final rinsing. This not only increases the time required to complete the washing operation but also leads to higher consumption of water.

(c) Based on combined cubicle:

In this option, there are two cubicles for the Dhobi – step one of the operation of beating and rubbing of clothes is done using water filled in one of the cubicles and step two of rinsing in done in a second cubicle, which contains clean water. In this system, the time taken for complete operations is less and consumption of water is comparatively lesser than the single cubicle system.



5.1.3 Planning Parameters

The planning parameters for a DG are described in the following passages focusing on cubicles, water supply, wastewater disposal etc.

Cubicles

- One cubicle is required for 6 Dhobi on the basis that three shifts in a day with each Dhobi using the DG once in 2 days.
- The optimum size of cubicle is 1200 mm x 1200 mm x 600 mm. The number of cubicles at a DG depends on the number of Dhobis using or likely to use the DG. While firming up on the location of a new constructed DG, it is desirable that distance of travel for a Dhobi from his place of residence does not exceed 2 Km.

Water supply

- Undoubtedly, reliable water supply in sufficient quantity is a must for proper functioning of a DG. This can be either from a piped water supply system or an independent tube-well, or a combination of the two sources, which is recommended option.
- The provision of a standby pumping set for the tube-well is desirable to facilitate regular maintenance or in the eventuality of a break-down to ensure that the operations at the DG run smoothly.

Disposal waste water

- Method of disposal of wastewater should ensure that there is no adverse effect on soil, ground water and the general environment in around the DG.
- It is recommended that the disposal takes place into a sewer or a drain provided they are tapped for diversion to a wastewater treatment plant. In the absence of these options, a mini-ETP with the provision of re-using part of the wastewater after recycling will have to be considered despite additional capital and O&M costs, and susceptibility to failures in electricity supply.

Space for drying clothes

- Sufficient paved space with proper arrangement for spreading the clothes should be available. Normally a Dhobi washes 20-50 clothes per day depending on the size and type of clothes. The space for drying should be planned on the basis of number of Dhobis working in one shift.

Shed over cubicles

- A shed over the cubicles should be provided to facilitate continuous operations under all weather conditions.
- The roof area can be used for providing space for ironing and drying of clothes.

Store for soiled clothes

- Provision for a lockable store should be made to enable the Dhobis to keep the unwashed clothes.

Rest room

- Rest room for the Dhobis and their family members should also be provided to enable the Dhobis to take necessary breaks during their working time.

Bhattis (boiling arrangement)

- Soaking of clothes in hot/warm water becomes essential in case of some of the soiled clothes to remove “adamant” stains.

Toilets

- Separate toilet blocks both for men as well as women should be provided
- Stand-post should be provided for drinking water

Safety

- Boundary wall with a gate all along the periphery of the DG should be provided for safety of clothes and belongings of the Dhobis. A plan showing the arrangements of various facilities is provided in Appendix L.

5.1.4 Wastewater Disposal Options

The effluent from the DG primarily comprises suspended solids from dirty clothes and phosphate from soaps, detergents, washing soda and other materials used in the washing process. The best option is to dispose the used water into the nearest sewer, or an open drain provided the latter is being tapped for diverting the wastewater to a treatment plant. In most urban cities, the domestic and industrial wastewater is getting mixed with the storm water, and direct disposal of the discharge into the river is causing significant pollution to the river although the share of Dhobighats can be considered to be insignificant. Disposal of the wastewater into stagnant water bodies can cause development of algae and other aquatic plants such as the water hyacinth.

The option of setting of a small effluent treatment plant, although offering the benefit of recycling part of the wastewater, does not appear to be financially feasible, and also has its own O&M difficulties in cities which witness long hours of no electricity supply.

Therefore, the ideal option is to connect the wastewater disposal to the nearest sewer. If not available, the facility has to be connected to a drain, which is finally tapped and diverted to a municipal sewage treatment plant.

5.2 OPERATION AND MAINTENANCE

5.2.1 Institutional arrangement for sustainable O &M

The primary survey shows that the Dhobis are members of their own Association. Considering that the Nagar Nigam is reluctant to take the responsibility of O&M of constructed DGs, it is best to hand over the O&M to the respective Dhobi associations, the willingness for which has been confirmed by the primary survey.

5.2.2 Evaluation of the Proposed Institutional Mechanism

The following table brings out the pros and cons of handing over the responsibility of O&M to the Dhobi Association.

O&M by	Pros	Cons
Dhobi Association	▪ Sense of ownership; will ensure optimal utilization; ▪ Willingness of users to contribute towards various activities as part of O&M can help build the ownership spirit. ▪ The availability of such ready infrastructure for commercial activities (e.g. Chicken clothing for domestic and export demand) can generate additional revenue for O &M	▪ Need "hand-holding" over initial year in respect of technical matters such as repair and maintenance works.

5.2.3 Set-up for a Dhobi Association

All present and potential users should be encouraged to join and form a Dhobi Association identifiable by a specific name/location. Institutional capacity building measures are to be assessed based upon their expected contribution to O&M activities. Such Association may be informal or registered under Society Act.

The mission of the Dhobi Association earmarked for O&M of a DG should be clearly agreed by members. The goals and objectives for a Dhobi Association could include:

- Regular and consistent use by all its members;
- Maintenance of the hygienic conditions and cleanliness in and around the DG;
- Maintenance of Dhobighat in good and usable condition at times; and
- Generation of revenue for O&M through the levy of user charges and other sources to exceed the projected O&M costs.

For the finalization of the structure and its institutional set-up, the bye-laws should be prepared in consultation with the different stakeholders. The Dhobi Association should select/elect a President, a Secretary, a Treasurer and Members of the Management Committee either on a rotational basis or through an annual election process. The responsibilities and duties for each position should be defined so as to avoid ambiguity and achieve the underlying objectives.

5.2.4 Capacity Building and Training

All community-based organizations face constraints that need to be understood, analyzed and overcome to make a success of any community development programme, which also has a parallel programme for environment improvement.

The general constraints faced by a community-based organization can be categorized as follows:

- Poor management skills
- Lack of technical skills related to O&M (for example, carrying out civil or mechanical repairs)
- Limited financial resources and difficulties in accessing donor agencies

The capacity building and training measures have to target overcoming the aforesaid constraints. The following list is an indicative list of activities, which may be required for institutional strengthening of the Dhobi Associations:

- Leadership training for committee members; e.g. conducting meetings, conflict resolution etc.
- Developing business plans for O&M with the objective of generating revenue surplus necessary for the creation of a fund to be used for future capital works and provision of pension schemes
- Developing linkages with local, state and central government social welfare schemes
- Improving internal administrative and financial procedures (accounting, personnel etc.)
- Role definition and its monitoring
- Determination of user charges and periodic financial reviews
- Defining operating policies (i.e disbursement approvals, use of equipment, collection of user charges etc.)
- Training on technical aspects such as civil and mechanical repair works and capacity-building for supervision of these works
- Determination of benchmarks for O&M for periodic review
- Sharing/dissemination of best practices

5.2.5 Suggested Institutional Mechanism for Sustainable O&M Dhobighats

The implementing agency transfers the responsibility and accountability for sustainable O & M of Dhobighats to PMUs in each city. The PMU shall be responsible , inter alia, for the following:-

- Construction and completion of the pilot as well as the main components of the project;
- Involvement of and ownership by communities during implementation of the project;
- Create a community apex institution which shall be responsible for sustainable O & M as well as

capacity building institution for the CBOs/SHGs/Dhobi Associations during and after the project is completed;
- Perform necessary monitoring and evaluation functions for successful implementation of the project with full accountability to IAs and funding agencies.
- Responsible for funds allocation and management to Training/Capacity Building Centres/ Apex body for CBOs/SHGs/Dhobi Associations
- Dissemination of information about the project
- Accountable for the specific and measurable project deliverables.

In each city, the PMU shall be headed by Project coordinator with accountability to the concerned Implementing Agency in the city, State department and donor agency. The PMU shall have representation from IA, elected representatives involving affected communities, a representative each from DUDA & SUDA, apex body of CBOs and prominent NGOs known for their contributions for promotion of health and hygiene and environmental work in affected communities.

Initially, A Training /Capacity-building Centre in each city shall be set up through concerted efforts, which shall be responsible for capacity building of CBOs/SHGs /Dhobi Associations during implementation and after completion of the project on self-sustainable basis. This unit shall be headed by a competent and experienced Training Officer with capability to manage capacity-building initiatives. This unit shall also have a community mobilization specialist who shall guide and assist in creation and strengthening the CBOs/ SHGs /Dhobi Associations. During implementation of the project as well as after the project is completed, this unit shall be responsible for continued awareness building, technical and managerial capacity-building as per attached institutional framework.

As the project proceeds towards completion, the management of the Training Centre shall be handed over to a newly created apex body representing CBOs, SHGs /Dhobi Associations. The general body members of this Apex body should have representative from each CBO. The resources created under the project shall also be handed over to the Apex body of CBOs/ SHGs /Dhobi Associations.

It is recommended that this apex body is registered under Society Registration Act. This representative body shall be undertaking the responsibility for sustainable O & M after the project is completed. This unit should be able to sustain itself through mutually agreed contributions from individual CBOs, IAs and other relevant departments responsible for health, hygiene, urban development and poverty alleviations.

5.3 OPERATION AND MAINTENANCE COST RECOVERY

The objective of the financial evaluation is to propose a cost recovery model aimed at sustainability of O&M considering that the capital costs (refer next section) are proposed to be provided through grant funds in this project.

(1) Capital Cost Estimation

The capital cost for Dhobighat comprising 25 and 50 washing cubicles are summarized below:-

Table 5.1 Preliminary Capital Costs (INR) for Constructed DG

	10 cubicles	25 cubicles	50 cubicles
Constructed Dhobighat	1,600,000	3,000,000	5,000,000

Note:
1. The facility includes roof, rest room, bore well (2 nos. for 25- and 50-cubicle DGs; for 10-cubicle DG, 1 bore-well and additional piped water supply recommended) and toilets.
2. Detail cost estimation is attached in Appendix.

Table 5.2 Rehabilitation of Existing Dhobighat

Facility	Purpose	Cost
Average cost of civil works	New building to cover the existing cubicles with space and facilities for ironing, resting, toilets etc. and boundary wall with gate	240,000
Provision for submersible pump, bore-well	Inadequacy of water supply has been noted; it is desirable to provide additional water supply arrangement from a bore-well to the existing piped water supply	50,000
Generator	Back up power supply	50,000
Electrical works	General lighting, ironing of clothes etc.	9,000
Average cost of rehabilitation per Dhobighat		**349,000** **Say 350,000**

(2) Operation and Maintenance Costs

The O&M costs for a Constructed DG comprise expenses/costs/charges for electricity, salary and wages for the supervisor and security, repairs etc. Among all the cost heads, the main components are wages and electricity. The O&M cost for a Constructed DG with 10, 25 and 50 cubicles are summarized below:-

Table 5.3 Estimated Monthly Operation and Maintenance Costs in INR

Cost Head	10 cubicles	25 cubicles	50 cubicles
Care taker cum watchman	2,500	2,500	2,500
Electricity	1,575	3,150	5,250
General Maintenance per month (average) including the pumps	450	900	1,500
Total	**4,525**	**6,550**	**9,250**

(3) Willingness to pay for O&M

The preliminary survey shows that most of dhobis expressed willingness to pay or to participate on a voluntary labour basis for O&M. Most of the Dhobis, who expressed willingness to pay, are ready pay more than Rs. 100 per month.

(4) Cost Recovery Measure

Sustainability of the project will depend on maximum usage of the DG. The criteria for cost recovery mechanism must have the following attributes:

- Simple to administer;
- Induce maximum usage (in the interest of project deliverables); and
- Ensure full recovery from the users.

To ensure full recovery, cost per family/Dhobi per month was estimated assuming DG usage levels of 100, 75 and 50 per cent as shown in Table below. A conservative usage level of 50 per cent may be assumed as a benchmark. However, the Dhobi Association should target to attain and achieve 100 per cent usage, i.e. operation and use of each of the cubicles in all the three shifts.

Table 5.4 O&M Cost per family/Dhobi per month in INR

	10 cubicles	25 cubicles	50 cubicles
Total operation & maintenance costs except electricity	2,940	3,400	4000
Electricity costs			
Full usage	1,575	3,150	5,250
75 % usage	1,181	2,363	3,938
50 % usage	788	1,575	2,625
Total costs by % of users			
Full usage	4,515	6,550	9,250
75 % usage	4,121	5,763	7,938
50 % usage	3,728	4,975	6,625
Cost per family/Dhobi per month per usage rate			
Assuming full usage	75	44	31
Assuming 75% usage	92	51	35
Assuming 50% usage	125	66	44

Note: One cubicle is assumed to be used by 6 Dhobis on the basis of three shifts/day and each Dhobi visits/uses the DG once in 2 days.

The above table clearly shows that the incidence of cost per family/person increases with decrease in usage level. Monthly user charges for 10-, 25- and 50 cubicle DG are Rs. 92, Rs. 51 and Rs. 35 per Dhobi for 75 per cent usage level. Based on the results of the primary survey, which indicated a willingness-to-pay user charges up to Rs. 100 per month, the project is expected to be financially sustainable and is therefore recommended. In case of the poor paying capacity of some of the users, these users should share the costs, especially of watchman through contribution of their labour.

5.4 SOCIAL AND ECONOMIC BENEFITS

This section deals with the benefits, both tangible and intangible, in respect of the construction/renovation of DGs. These benefits can be conveniently classified in the following groups:

(1) Environmental benefits:

Once all the constructed Dhobighats envisaged under this project become fully operational, the level of pollutants going into the rivers is expected to reduce. The construction of Dhobighats shall result in reduction of detergents flowing into the river every day. This shall, inter alia, result in improvement of quality of water in the rivers besides generating important health benefits and positive environmental externalities.

(2) Health-related benefits:

Improvement of water quality shall result in reduction in the incidence of water-borne diseases. Also, properly designed facility would also reduce the incidence of skin infections amongst the Dhobis.

(3) Institutional benefits:

The project is expected to strengthen the Dhobi Associations through capacity–building in areas like financial management and leadership, and will result in overall empowerment of community organizations.

(4) Economic Benefits:

Economic benefits include productivity gains, secondary economic benefits and developmental impact due to improved health and lower incidence of water-borne diseases. This project shall ensure access of convenient facilities to the Dhobis at affordable prices.

5.5 IMPLEMENTATION OF DG PROGRAMME

5.5.1 Requirement of DGs

Currently, washing activity on the banks of the rivers in Allahabad is prohibited and no permanent washing facility was found during the primary survey in October 2004. However, 14 small traditional DGs used by 170-180 Dhobis were identified during an earlier survey conducted by the JICA team. This can possibly be explained by the strict vigil of the "River Police". However, it is recommended that a 30-cubicle DG be set up in DG to rehabilitate the Dhobis who might be surreptitiously using the river banks (especially on Yamuna) for their washing activities.

(1) New Dhobighat Facility

At present, the following five (5) Constructed DGs have been planned by local authorities and sanctioned by the state government. These are being implemented by DUDA, Allahabad Development Authority (ADA) and Allahabad Nagar Nigam.

Table 5.5 Existing Plan for Constructed Dhobighats in Allahabad

No.	Location	Specification	Implementation Agency
1	Mori Daraganj	6 cubicles (12 users), expansion of existing facility	DUDA
2	Minto Park Ghat	5 cubicles (10 users), new facility	DUDA
3	To be identified		ANN
4	To be identified		ANN
5	To be identified		ADA

These planned dhobighats have the capacity to cater to the existing needs of Constructed Dhobighat.

(2) Improvement of Existing Dhobighat

Following rehabilitation works have been identified during preliminary survey and through discussions with DUDA.

- New building to cover the existing cubicles with space and facilities for ironing, resting and toilets etc.
- New submersible pump, generator and electricity works
- Boundary wall with gate

The estimated capital cost of improvement works per Dhobighat is Rs. 350,000.00. Five existing Dhobighats have been identified in Allahabad. Therefore, the total capital cost of improvement works for the existing facilities is estimated as Rs. 1,750,000.00.

5.5.2 Programme Implementation Strategy

(1) Project Implementation Concepts for Improvement of Existing Constructed DGs

The proposed Dhobighat programme to relocate the existing traditional DGs/improve or renovate the existing DGs adopts a community-based approach in planning, implementing, operating and maintaining Constructed DGs. In Allahabad, no new facilities (besides those already on the anvil) have been proposed in this project, although improvement works have been proposed. To manage the improved facilities in an appropriate manner, the functioning of the existing Dhobi Associations will require improvements through a process of capacity building. To do so, the JICA Study Team recommends that a pilot project to manage Constructed DGs be implemented and a good example or model for O&M be created. This model project can then be extended to other facilities in the City.

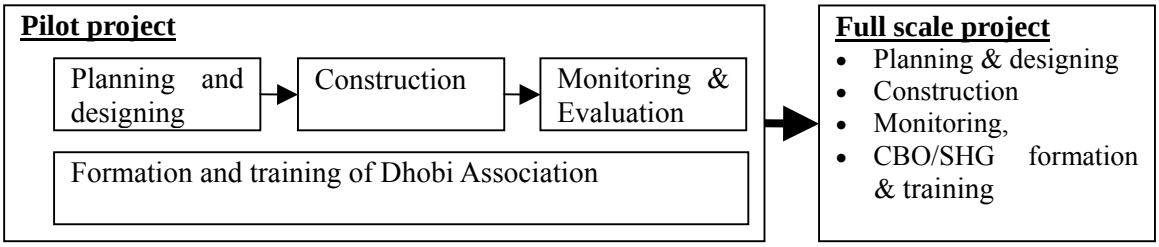


Figure 5.1 Program Implementation Strategy

(2) Institutional Setting Up for Monitoring

The proposed institutional set-up is graphically presented in Figure 5.2. Nagar Nigam, the main body responsible for health and hygiene, should regularly monitor the functioning of the DGs within Municipal limits. It should interact with the coordination committee comprising elected members of the Associations and representatives of DUDA and ADA besides their own representatives including the Health Officer. This committee will discuss the problems faced by the associations in the O&M of DGs and find solutions, elicit feedback from the associations and facilitate the monitoring, evaluation and learning process. These activities will have to be dovetailed with the proposed activities of Public Participation and Awareness for non-sewerage schemes.

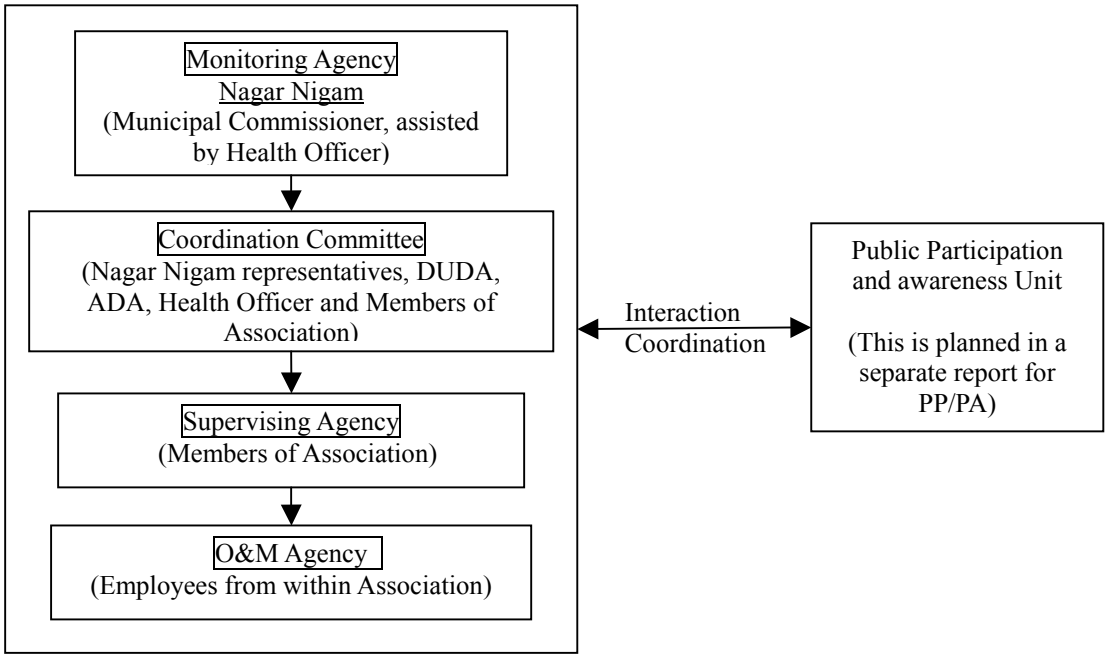


Figure 5.2 Proposed Institutional Set Up for Dhobighat Monitoring

(3) Operation & Maintenance and Monitoring Plan

The day to day O&M is proposed under the aegis of respective Dhobi Associations. They will also be key players in the monitoring and evaluation process.

Based on the guidelines suggested in this report, the implementing agency should develop a mechanism for monitoring and evaluation considering the following aspects:

- It has to be an ongoing process – assess the situation, analyze it, take corrective measures where necessary and record the same as part of the lessons learnt;
- Follow-up on the above to ensure that the members of the Dhobi Association are learning from successes and mistakes;
- Implementation plans should be prepared on an annual basis; the process should incorporate quarterly, half-yearly and annual assessments besides regular fortnightly visits to enable trouble-shooting; the intermediate assessments will also facilitate revisions to the implementation plan wherever necessary;
- The reports should be delivered to the responsible departments/agencies at city/district/state government/central government levels as well as the funding agency; this process will facilitate any initiatives that may become necessary at legal or policy levels;

The "Constructed Dhobi Ghat" monitoring and evaluation cell constituted at Nagar Nigam will monitor the programme in order to make an ongoing assessment of the program and take action where necessary. The Dhobi Association will monitor construction of ghats, and water and electricity supply required for their work.

The evaluation cell should comprise representatives of the Nagar Nigam, DUDA, SUDA, Jal Sansthan, State Electricity Board, Dhobi Association and other social groups whose leadership is valued and who are currently active in improving the working conditions of the Dhobis.

(4) Public Participation and Awareness for Constructed DG Programme

The role of PP/PA does not get diminished for Dhobighats by virtue of their relative simplicity of O&M. In addition to educating the members about the norms to be observed for use of ghat, use of chemicals and monitoring devices, they can also be assisted in preparing checklists and fixing periodicity for O&M. As in the case of CTCs, role of PP/PA can extend beyond O&M and supervision, and include extension programmes for family and community welfare.

The PP/PA programme in case of Dhobighats will have to address some of the following critical issues:

- Educating the Dhobis on the negative impact of washing clothes/fabrics on the river banks;
- Explaining the benefits of constructed Dhobighats;
- Developing a CBO wherein an environment to facilitate exchange of ideas on adopting new practices (e.g. better detergents instead of a harmful mix of acid and "soda") can be created;
- Involving the association(s) of Dhobis to build a sense of ownership, and transfer the responsibility of O&M to the users of the constructed Dhobighats; this can not only facilitate change in practices, but also encourage acceptance of "new" ideas, and facilitate suitable cost recovery model - "pay-as-you-use";

Capacity building and awareness campaign

Orientation workshop should be held so as to include representatives of dhobis associations and their sub-groups from all the ghats. The recommended agenda for these workshops is as follows:

- Presentation on institutional arrangement
- Overview on formation of CBO
- Overview on functioning, role and responsibility of CBO
- User charges and collection; accounting and book-keeping
- Role of urban local bodies
- Operation and maintenance
- Monitoring of Dhobighats
- Maintenance of water pump and other facilities at the constructed Dhobighats
- Reporting to the Nagar Nigam
- Mobilizing membership
- Setting ground rules for members User charge recovery accounting and bookkeeping
- Operation and maintenance log
- Monitoring of Dhobi ghats

(5) Programme Monitoring

The process of monitoring, evaluation and learning will serve the need for interventions where necessary and facilitate improvements on an ongoing basis. A checklist with the benchmarks is proposed to identify any deviations and initiate course-correction measures. Table 5.6 proposes a schedule for different monitoring activities.

Table 5.6 Monitoring Items

Data requirement	**Frequency of data collection**	**Data collectors**
Training		
Number of workshop held	Monthly reports	Implementing agency (NGO/Consultants)
Number of participants in workshops	Monthly reports	Implementing agency (NGO/Consultants)
Program expense	Monthly reports	Implementing agency (NGO/Consultants)
Distribution of communication material	Monthly report	Implementing agency (NGO/Consultants)
Construction related		
Number of dhobi ghats developed	Monthly report	Dhobi association and Local Body
Adherence to approved drawing and estimates	Periodically	Engineering div, Local Body
Progress of construction as per time chart	Periodically	Engineering div, Local Body
Quality of construction	Regular checking during construction	Engineering div, Local Body
Operation and maintenance		
Water consumption pattern	Monthly	Water Dept/Local body
Electricity consumption	Monthly	Electricity department

Quality of maintenance Of the ghat and the facilities	Random checking	Local Body
Evaluation		
Indicators		
Degree of abatement of pollution in the river	Quarterly	Pollution control board
Rate of acceptability of ghats	Quarterly	Dhobi association and local body
Improvement in general health of dhobis	Six monthly	Health department

5.5.3 Total Program Cost of Improvement Works for DGs

Table 5.7 Cost Details of Improvement Works for DGs for Allahabad City

Type of Works	Cost per Dhobighat (In Rs)	No of Proposed Dhobighat	Total Cost(In Rs)
Improvement works	350,000	5	1,750,000
Total Capital Cost	-	5	**1,750,000**

5.5.4 Preliminary Implementation Cost for Improvement Works in DGs

Based on following planning conditions, yearly total project costs have been worked as shown in Table below. Total project implementation cost will be Rs.2.2 million.

- One pilot project
- Improvement works only
- Physical contingency is 5 per cent of the capital cost
- Consulting and engineering costs is 10 per cent of the capital cost
- Project Administration costs is 10 per cent of the capital cost

Allahabad	**Year**		
	2007	**2008**	**Total**
New facility	0	0	0
Improvement works	1	4	5
Capital Costs	350,000	1,400,000	1,750,000
Physical contingency (5%)	17,500	70,000	87,500
Consulting and Engineering Costs (10%)	35,000	140,000	175,000
Project Administration Costs (10%)	35,000	140,000	175,000
Total	437,500	1,750,000	2,187,500

CHAPTER 6

CONCLUSION AND RECOMMENDATION

CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

The objectives of this study are to formulate programs of development/ management of Community Toilet Complexes (CTCs) and Constructed Dhobighats (DG); to assess the technical, institutional, financial and economic viability; and to assess the environmental and social soundness of the proposed programs.

The objective of the proposed programmes is to improve slums and DGs' sanitary conditions, thus improving water quality of rivers.

The shortcomings in the operation and maintenance (O&M) of existing CTCs in slum areas and Dhobighats are causing serious problems in proper functioning and general sanitation in the surrounding areas. O&M aspect is one of the main factors to be considered in formulating sustainable programmes of CTC and Constructed DG. Keeping this in mind and on the basis of the assessment of existing conditions of the target areas and facilities as well as the needs and demand of slum dwellers / Dhobis, the proposed programmes are formulated.

The proposed programmes adopt a needs-driven and community-driven approach in planning, implementing, operating and maintaining the facilities and suggest that the O&M is facilitated through local CBOs/SHGs or local Dhobi Associations. Implementation by this approach will make the programmes technically, financially, socially and culturally viable.

For successful implementation or the programmes, the following are required:

- Involvement and assistance of NGOs/Consultants for training and monitoring
- Regular monitoring, evaluation and feedback on the functioning of CTCs and Constructed DGs by Nagar Nigam in coordination with SUDA, DUDA and representatives of CBO/SHG.
- Appropriate implementation steps as follows to ensure involvement and training of CBOs/SHGs or Dhobi Associations:

Step 1:	Needs survey of slum / Constructed DG
Step 2:	Creation of CBOs/SHGs/ Dhobi Association
Step 3:	Planning and designing
Step 4:	Selection of location of CTC/Constructed DG including land acquisition clearance
Step 5:	Construction
Step 6:	Training of CBOs/SHGs/ Dhobi Association during construction
Step 7:	Operation and maintenance
Step 8:	Monitoring, evaluation and learning
Step 9:	Feed back

Creation of a CBO/SHG for O&M of CTCs has not been attempted earlier. Therefore, it is proposed that a pilot project to manage CTC through CBO be implemented and a good model for O&M of CTC be created before implementing full-scale project. Similarly, to manage the improved or new facilities of Constructed DGs in an appropriate manner, the functioning of the existing Dhobi Associations will require improvements through a process of capacity building. This capacity building will be also tested through a pilot project. This model project can then be extended to other proposed facilities.

One of the important constraints relating to O&M is the lack of funds. To make the project financially feasible, a minimum monthly charge of Rs. 70 per household, is required to be levied alongwith subsidy for electricity and sludge disposal costs (where applicable) by the local bodies and part of manpower costs being provided by the community through voluntary activities. This level of user charge was assessed affordable and acceptable even for low-income communities as their willingness to participate in the project is very high. Besides, if the facilities are well maintained and kept clean the willingness to pay will improve and the project will become financially more viable.

The estimated monthly user charge per member for O&M of a Constructed DG is Rs. 35 to Rs. 92. Based on the results of the primary survey, which indicated a willingness to pay user charges up to Rs. 100 per month, the project is expected to be financially feasible.

If followings are considered in the proposed facilities, the projects are expected to be technically feasible and would also ensure adequate O&M of the facilities.

CTCs
- Constant water supply for flushing and cleaning of water closets (seats)
- Sufficient capacity of storage tank for constant water supply
- Regular electricity for tube well and lighting

Constructed DGs
- Appropriate design and quality of construction to ensure no leakage
- Constant water supply
- Amenities (toilet, rest room, safety measure, shed, etc)

Land availability for both CTC and Constructed DG facilities is the most critical aspect for the feasibility of the study. The results of a rapid survey to assess the land availability in several slums indicated that the land for CTC can be made available in half of the slums surveyed. These lands are mostly owned by the various government bodies and efforts have been made to select lands without any disputes or encumbrance. However, more detailed surveys are required to decide the best location by matching the demand for CTC and the availability of lands. A detailed study should be done at the detailed design stage with the help of hired NGO/Consultants and communities.

Environment and sanitation condition of slums and DG will improve by the implementation of these programmes by reducing pollution load caused by open defecation and improving the facilities. However, if wastewater of the facilities is not properly disposed off, it would create other problems for the environment. In the programme, on-site wastewater treatment plant is not proposed since it requires very high capital and operation and maintenance costs and is not financially feasible at present. Also it requires high skill and technical knowledge to operate and maintain. Therefore, it is recommended that CTCs and Constructed DGs be connected to existing/proposed sewer line if nearby sewer is available and if not available, then septic tank/soak pit system could be connected with CTCs. As for Dhobighat, if no sewer line is available, the facility has to be connected to a drain, which should be finally tapped and diverted to a municipal sewage treatment plant.

The project shall generate tangible and intangible benefits as follows:

- Environmental benefits are expressed through reduction of pollution load caused by open defecation
- Health-related benefits include reduction of the incidence of water-borne diseases resulting from poor sanitation.
- Economic benefits include productive gains, secondary economic benefits and developmental impact due to improved health and reduced health costs
- Social or equity benefits include gender, regional and income-related equity through appropriate sanitation for women and girls who are most affected by poor sanitation. This project empowers the women's group and assists in improving earnings for the communities. Also, this project ensures access to quality services for affected communities.
- Institutional benefits are expressed to strengthen the CBO/SHGs through capacity-building.

Appendix A

SURVEY SHEET FOR ABATEMENT OF POLLUTION IN REGARD TO COMMUNITY IN LUCKNOW / KANPUR & ALLAHABAD CITY

Schdule no.		Name of investigator		date
1	Name			
1.2	Gender	Male		female
1.3	Educational status	a) Illiterate b) Literate c) Below primary status d) 8th pass e) 10th pass f) graduate g) Post graduate h) Other		
1.4	Average monthly income.	Rupees		
1.5	Are you belong to this city	Yes	No	
1.6	If not from where			
1.7	Since when are you living here			
2	**General questions**			
2-1	Do you take care of your health?	Yes		No
2-2	Are you aware of microorganismsand diseases caused by them?.	Yes		No
2-3	Are you aware of the garbage around your habitation	Yes		No
3	**Community toilet complexes**			
3-11-	Do you know about the existence of the public toilet in your area?	Yes	No	
3-2	If yes how do you know about them?	a) Poster b) Through Public awareness programmes c) Regional /community politician d) Health center e) other		
3-3	Do you utilise the public toilets?	yes	no	
	If the answer is no then see Q 3-20			

3-4	If yes how many times	Always / daily Often Very often	
3-5	What is the main concept of having public toilets (etc)	a) For defecation b) For urination c) For bath d) Other	
3-6	Do you pay for using public toilets	Yes	No
3-7	If yes than what amount.	Rupees (per person / daily) Rupees (family / monthly)	
3-8	What is your opinion about the cost ?	a) costly b) Resonable c) Low d) Can't say	
3-9	Why do you use public toilets?	e) No indiviual household toilet f) Privacy g) Near to house h) Prohibit diseases tospread i) Other	
3-10	Do you know the advantages of using public toilets?	Yes	No
3-11	If yes ,what is it ? .	a) To have a clean environment b) To stop spreading the diseases c) Privacy d) Other	
3-12	Where did you go for defecation before construction of the toilets in your area.	e) Public toilets in other areas f) Open area g) Neighbour's toilet h) Other	
3-13	Do you intend to utilise these public toilets always	a) Yes b) No c) Can't say d) Not aware of	
3-14	You the think the no. of seats of public toilets are enough .	Yes	No
3-15	Do you want bathing facility in the public toilets also	Yes	No
3-16	How is the maintanece of this public toilets?.	a) Very good b) Satisfactory c) Bad d) Very bad	

3-17	According to you what are the loopholes in the upkeepment of the public toilet.	a) Not clean/hygienic b) Water scracity c) Lack of Privacy d) Erratic power supply e) Others	
3-18	Do you have any improved idea to make these public toilets more effective.	Yes	No
3-19	If yes than what are these? Please inform	a) Increase public awareness programme b) Impart Training to the care takers. c) Lodge complain to Nagar Nigam from time to time about existing problems. d) Don't know / not aware. e) Other	
Responder who has given the answer of question no.3-3 in no :Qno.3-20 to 3-22			
3-20	Current poisition of public toilet.	a) Household toilet b) Nieghbour 's toilet c) Open ground d) Other	
3-21	What are the reasons for not using the public toilets.	a) Don't know b) Pay money c) Very far d) Not clean e) No privacy f) Other	
3-22	What are your suggesstions to make the public toilets more effective and better.	Specify:	
4	**River and related issues:-**		
4-1	What is your opinion about the quality of river water.	a) clean b) Polluted c) Don't know / can't say	
4-2	Do you think that there is need to improve the quality of river water.	Yes	No
4-3	In your opinion, What are the main sources of river pollution?	Household sewage water Live stock / sewerge Loundary /dhobi Bathing Disposal of dead bodies Open defecation Others	
4-4	Do you know that open defecation is harmful for health and environment .	Yes	No

4-5	Do you think that public toilet should be constructed to reduce river pollution.	Yes No Can't say /don't know	
4-6	Are you willing to pay for using public toilets.	Yes	No
		Can't say / don't know	
4-7	If yes what amount .	50p 1Rs Others	
5	**People 's Participation**		
5-1	Do you like to participate in community programmes for reducing river pollution.	Yes	No
5-2	If yes then how do you want to participate.	Cleaning activities Raising Money To initiate Public awareness programmes Others	
5-3	How do you like to participate in increasing optimal uitilisation of public toilets among common people?	By initiating public awareness programmes. By paritcipating in operationand maintenance of the facilities . Others	

Personal Observations

Focused Group Discussion

Appendix B

SURVEY SHEET FOR ABATEMENT OF POLLUTION IN REGARD TO DHOBIGHATS IN LUCKNOW / KANPUR & ALLAHABAD CITY

Name of Investigator: Mr. / Ms

Date of investigation: /October / 2004.

1	**Socio-economic Profile**								
1.1	Name of the Respondent								
1.2	Address								
1.3	Location								
1.4	Name of the head of the household								
1.5	Religion								
1.6	Type of the family	Joint		Nuclear		Extended			
1.7	Total no of family members								
1.8	Total no of adults in the household								
1.9	Total no of children in the household								
		Male		Age		Female		Age	
1.10	Total no of male/ female								
1.11	Literate/illiterate								
1.12	Children going to school & collages								
1.13	Total no. of family members engaged in washing								
1.14	Any other occupation undertaken by the family	Specify							
1.15	Are you suffering from any Chronic Disease	a) Eyes b) Breathing Problem c) Skin Infection d) Stomach e) Any Other							
1.16	Where do you go for your Treatment?	a) Private Clinic b) Govt. Hospital c) Vaid d) Homeopathic e) Self Treatment							
2	**Current Practices**								
2.1	Average no. of clothes washed everyday	> 50	< 50						
2.2	Material Used	Acid	Beaching Powder	Castic Soda	Washing soda	Sweet Soda	Low cost detergent	Other	All of them
2.3	Quantity used per day								
2.4	Source of water	River	Pond	Well	Bore Well	Other			
2.5	Water Disposal system								
3	**Current Status**								
3.1	Facilities currently available	a) Water b) Electricity c) Drying Space d) CTCs. e) Any other							

3.2	Are you a member of any association	Yes	No	
3.3	If yes, give details of Association			
3.4	Amount charged for washing per item of Clothing			
3.5	Are you satisfied with the present system for carrying out the washing practices	Yes		No
3.6	If 'No' give reasons			
3.7	DO you want a comprehensive complex to be constructed	Yes		No
3.8	Where to constructed			
3.9	What do you think are the requirements for a Dhobighat	a) Water b) Electricity c) Platform d) Drying Area e) Distance From Home f) Provision of Bhatti g) Space For Ironing h) Crèche Cum School i) Medical Room j) Rest Room (Male/Female) k) Canteen l) Approach road m) Mode of transport		
3.10	Do you think the rate of washing need to be enhanced to meet the extra burden	Yes		No
3.11	If yes, indicate the revised rate of washing			
4	**Level of awareness**			
4.1	Do you think that the present system of washing clothes is polluting water of river	Yes		No
4.2	If 'Yes' what are your suggestions to check the pollution			
5	**Operation & Maintenance**			
5.1	Are you willing to contribute for the construction of Dhobighats	Yes		No
5.2	If yes, then How will you contribute	a) In cash b) Sharamdan c) Any other		

5.3	Would you like to pay charges for facilities to be provided for improving Dhobighats	YES		NO	
5.4	If yes, indicate the amount per month which you can pay	<100	>100		
5.5	How would you like to manage the ghats	Nagar Nigam	DUDA	NGOs	Own Association
5.6	Any other suggestion/comments				

Personal Observations

Focused Group Discussion

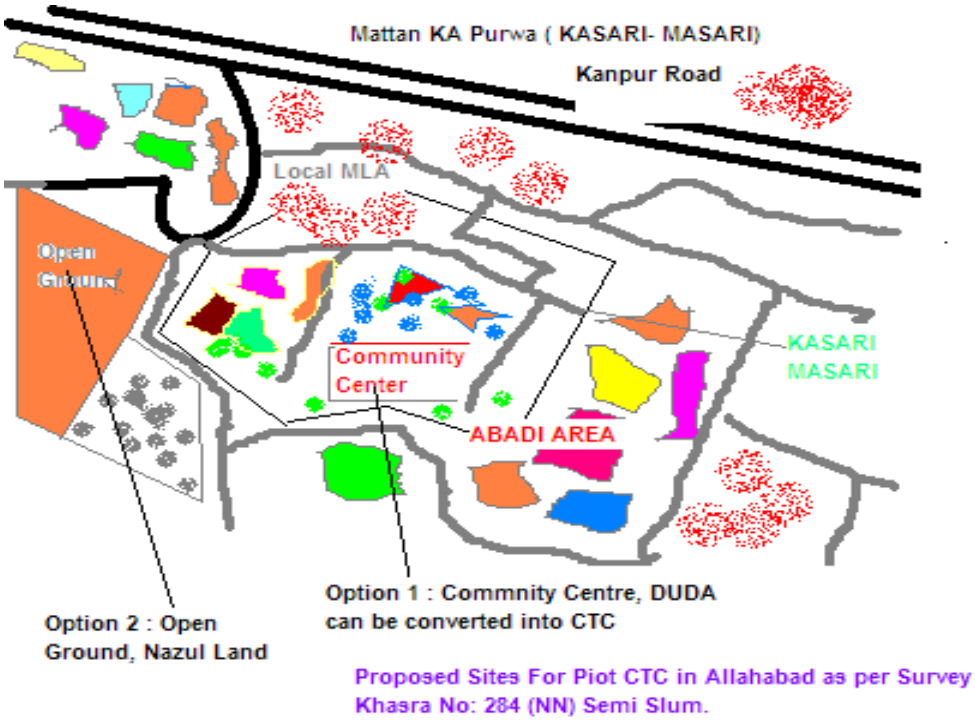
Appendix C

FOCUS GROUP DISCUSSIONS AND SOCIAL MAPS – ALLAHABAD
1. Area Name: Mattan Ka Purwa. (WEST).

Socio Economic Profile:

KASARI – MASARI as known locally has brick lined pavement inside the congested housing hutments developed by DUDA with hutments constructed haphazardly all through the pavement This Place is situated on the western side of Allahabad near Allahabad Kanpur Railway line. Its is about 2.5 KM inside from the Main Kanpur Road and consist of Mixed Population from the various caste and creed. The place is inhabited mostly from the people who are daily wage earners and some are privately employed. No facility for any sort of Health centre is available in the vincity and out break of various diseases has been reported. Some women development Schemes have been carried out by Various organisations but that doesn't seems to have made any impact.

Maintenance Authority: Allahbad Nagar Nigam.
Type of Drainage: Surface Drains as developed by DUDA
Disposal Point: To a major drain and Low lying waste land or to the vacant plot nearby.



Current Facilities:

The area when visited by our team was full of dirt and filth and drain water overflowing on to the lanes and by lanes to our surprise we found that a community center exist there but no attention has been paid to tackle the problem of open defecation by the residents and no CTC has been constructed. Around 4500 of population is registered as voters and the local MLA is quite influential person and hold a good rapport with the government. Community has a water supply with Municipality and local Hand pump. The present scenario is that most of the women want a CTC to come up immediately in their area as they have been chased for defecating in the open ground but could not specify a Space for the same. One probable site found is the Community Center being converted into a CTC and above that we have an arrangement of having a community hall.

Focal Group Discussions:
Date: 02 November 2004
Place: Kasari Masari (Mattan Ka Purwa).
People Present: Haider Abbas, Utparn Dubey, Ms. Rajshree Sharma, Mr. Anuj Sharma, Dr. UD Dubey, 3 members of Survey Team, Mr. Prajapati (Local NGO Activist), and Mr. Gupta Project Officer (DUDA).

A meeting was held with around 50 to 60 local people on 02 November 2004 involving the local CDS and staff from DUDA Allahabad to invite the suggestion for better amenities and study the outcome for their participation for the overall development. A section of people expressed their concern for non-cooperation from the government agencies towards degrading conditions. When asked how they themselves could improve their living condition by adopting various O&M schemes which can solve the basic issues there were various mixed response to that, Overall outcome of the meeting was very fruitful and people expressed their willingness to share the responsibilities for maintenance and upkeep of the facilities to be provided in future.

2. Area Name: Baghara (North).

Socio Economic Profile:

Baghara is situated north of allahbad near Prayag Railway station and is bounded by Village Salori and village Sadidabad and is approachable through brick lined pavement inside the congested housing hutments developed by DUDA with hutments and dinghies of various sizes and shape constructed haphazardly all through the pavement. The place is inhabited mostly from the people who are daily wage earners and some are privately employed and consist of various castes from Brahmin to SC and OBCs. No facility for any sort of Health centre is available in the vincity and out break of various diseases has been reported especially due to water contamination and Mosquitoes.

Maintenance Authority: Allahbad Nagar Nigam.
Type of Drainage: Surface Drains as developed by DUDA
Disposal Point: To a major drain and Low lying waste land or to the vacant plot nearby finally taking shape of a Pond filled with filth and sewerage water.

Current Facilities:

When talking of Facilities with the community we found that no CTC exist in the area and generally all the people go for open defecation or children use the Surface drains despite being aware that it is harmful to health and society. The upper caste community consisting of Brahmin and Thakurs of village is quite dominant and generally plays an important role to development issues. People are ready to pay for the use of CTC but not to the construction of the same. CTC if constructed will serve to an approximate population of 4500 persons per month and participants also said they cannot help in

locating the space for the same. As no government space or land is available in the area some tough measures may have to be taken.

3. Area Name: Phaphamau (South).
Socio Economic Profile:

Phaphamau is situated south of Allahabad just on the entrance of Allahabad from Lucknow Road and on the banks of River Ganga. It is in itself growing at a very fast pace and has got a potential to be satellite township of future for Allahabad. The village is connected by a brick lined pavement and with Kutch and Pucca households and around 8000 of the population is a registered in voter list of area. The residents of the village consist of YADAV, HARIJAN, PASI, but is generally dominated by Upper caste Brahmins.

Maintenance Authority: Nagar Panchayat/ DUDA/ DRDA.
Type of Drainage: Surface Drains as developed by DUDA under GAP-1
Disposal Point: To a major drain and Low lying waste land.

Current Situation:

The Village is electrified and Electricity remains for an average of 8 to 11 hours daily. Open defecation is quite prevalent in the area as no CTC or Public Latrine is available in the Area and most of the houses doesn't have one in their house except the Few in Upper caste houses and atmosphere is that to a typical Village getting degraded day by day into a slum. Most of the residents of the village go to Allahabad to earn their livelihood or to work for their concerned employers. Maximum sewage being generated in the village is either flowing into the Pond then to River Ganga passing Thru Flood Land adjoining the village. Demand for a Sulabh type of Latrine was expressed by the residents and welcomed the suggestion for the upkeep and maintenance of the same with help of the village community.

Focal Group Discussions:
Date: 03 November 2004,
Place: Village Phaphamau.
People Present:

Haider Abbas, Utparn Dubey, Ms. Rajshree Sharma, Dr. UD Dubey, 6 members of Survey Team. Mr. Prajapati (Local NGO Activist), and Mr. Gupta Project Officer (DUDA).
A meeting was held with around 25 to 30 local people on 03 November 2004, involving the local CDS of the area and staff from DUDA Allahabad to invite the and make people aware for better facilities and proper health and hygiene and study the outcome for their participation for the overall development. A section of people expressed their concern for degrading factors for non involvement from government agencies and secondly their lack of awareness towards the issues. When asked how they themselves could improve their living condition by adopting various O&M schemes which can solve the basic issues there were various mixed response to that, Overall outcome of the meeting was very fruitful and people expressed their willingness to share the responsibilities in form of shramdan and various activities of Public awareness for maintenance and upkeep of the public complex.

4. Area Name: Jodhwal (South).

Socio Economic Profile:

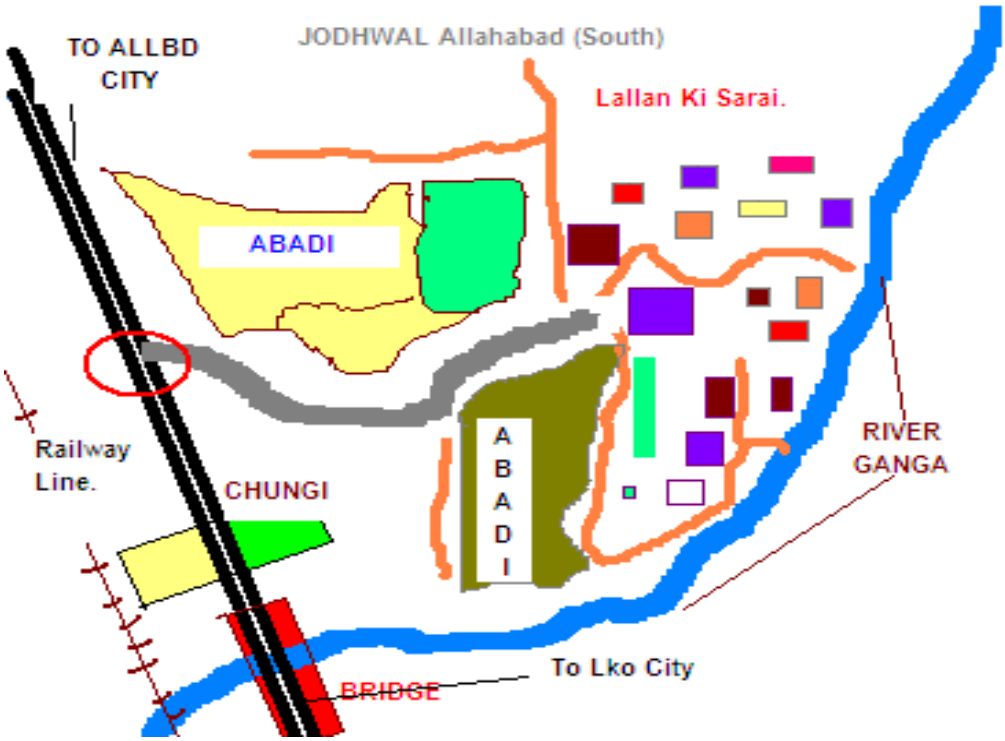
JODHWAL is situated south of Allahabad just on the entrance of Allahabad from Lucknow Road after crossing the Ganga Bridge and on the banks of River Ganga. It is in itself growing at a very fast pace and has itself developed into a mixed township of Allahabad. The village is connected by a

Charcoal Road and with Pucca households all along the road side and few kutcha houses and around 250 household with population of 5000 and above is a registered in voter list of area. The residents of the village consist of YADAV, HARIJAN, PASI, but is generally dominated by YADAVS.

Maintenance Authority: Nagar Nigam/ DUDA/ DRDA.
Type of Drainage: Surface Drains as developed by DUDA under GAP-1
Disposal Point: To a major drain and Low lying waste land.

Current Situation:

The Village is electrified and Electricity remains for an average of 8 to 11 hours daily. Open defecation is quite prevalent in the area as no CTC or Public Latrine is available in the Area and atmosphere is that to a typical Village getting degraded day by day into a slum. Most of the residents of the village go to Allahbad to earn their livelihood or to work for their concerned employers. Maximum sewage being generated in the village is either flowing into the Pond then to River Ganga passing Thru Flood Land adjoining the village. Demand for a Sulabh type of Latrine was expressed by the residents and welcomed the suggestion for the upkeep and maintenance of the same with help of the village community. IHL are also prevalent in the area and some of them were constructed with the help of DUDA/ DRDA under GAP-1.



Focal Group Discussions:
Date: 03 November 2004,
Place: Jodhwal Village Lallan Ki Sarai.

People Present:

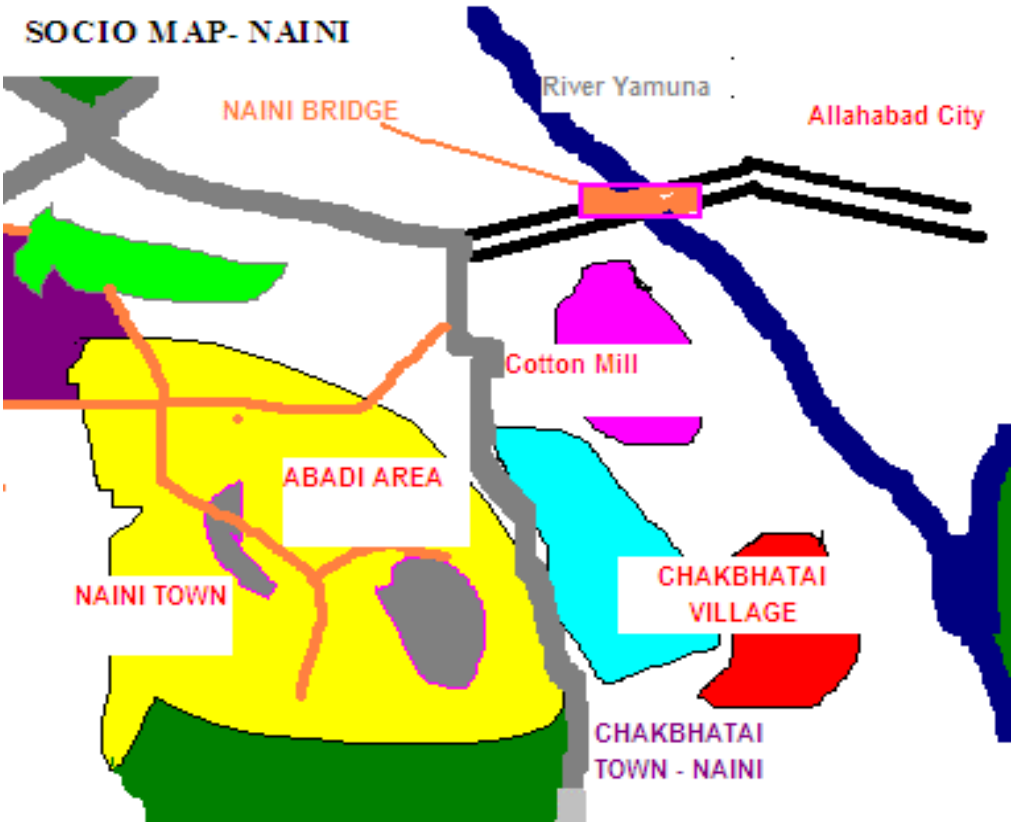
Haider Abbas, Utparn Dubey, Ms. Rajshree Sharma, 12 members of Survey Team. Mr. Prajapati (Local NGO Activist) and Mr. MK Gupta, Project Officer (DUDA). Shri. Ramadin Yadav - community Representative.

Meetings was held with around 35 to 50 local people and Mr. Ramadin and Bhullan Prakash on 03 November 2004, to invite the ideas and views and make people aware for better facilities and proper health and hygiene conditions and record the outcome for their for the overall development. A cross section of people expressed their happiness for what they are and were happy with the present system and did not want any work to carried in their area stating various reasons such as non involvement from government agencies and secondly their lack of integration among themselves towards the issues. When asked how they themselves could improve their living condition by adopting various O&M schemes which can solve the basic issues there were various mixed response to that, Overall outcome of the meeting was fair and people expressed their unwillingness to share the responsibilities in form of shramdan or various activities of Public awareness.

5. Area Name: Chakbhatai. (Allahabad East).

Socio Economic Profile:

Chakbhatai (NAINI) is situated across the River Yamuna East side of Allahabad just on the entrance of Allahabad from NAINI side before crossing the River Yamuna. It is in itself was one upon a time a Industrial Township of Allahbad with famous cotton mill and others and still enjoys that recognition but has grown haphazardly with improper planning and lack of interest from Government Authorities and has itself developed into a mixed township of NAINI. The township is connected by a Charcoal Road and with Pucca households and good Market all along the road side and few kutcha houses and around 2500 household with population of 25000 and above is a registered in voter list of area. The residents of the village consist of YADAV, HARIJAN, and PASI and of course some Brahmin. Being an old industrial township it attracted lot of people from various places to work as labour in the factories.
Maintenance Authority: Allahbad Nagar Nigam/ DUDA.
Type of Drainage: Surface Drains as developed by DUDA under GAP-1
Disposal Point: To a major drain and Low lying waste land. And finally to River Yamuna near Sangam.



Current Situation:

The township is electrified and Electricity remains for an average of 8 to 11 hours daily. Open defecation is not so prevalent in the area as most of the houses have their own independent toilets but majority of the daily wage earners spoil the show who live in small hutments and dinghies. Chakbhatai itself has around 12000 voters and in various labour colonies the only Park is near welfare center as made by DUDA and the CDS formed by the Agency has taken a Political Platform. Some part of the township was developed with Drainage system and sewer line was laid in some part of the city and which is also lying defunct and semi operational due non completion of full scale project. Overall education is lacking among the community and branch Sewer network was never given any priority. Some health problems do persist in the area due to lack of awareness on health and hygiene issues and improper sanitation practice.

Focal Group Discussions:
Date: 04 November 2004,
Place: NAINI- Village Chakbhatai.
People Present:

Haider Abbas, Utparn Dubey, Ms. Rajshree Sharma, Dr. UD Dubey, Mr. Arun Kumar, Mr. Anuj Sharma, 4 members of Survey Team. Mr. Prajapati (Local NGO Activist) and Mr. MK Gupta, Project Officer (DUDA). Smt. Pandey Local Sabhasad Naini, Smt Durgesh Devi CDS DUDA.

Meetings was held with around 25 to 40 local people and on 04 November 2004, around 11:30 AM to 2:30 PM at community center DUDA to invite the ideas and views and make people aware for better facilities and proper health and hygiene conditions and record the outcome for their for the overall development. A health awareness game was also organized by the team to make people aware and educate them indirectly. A cross section of people expressed their happiness for the thing and awareness programme carried out by the team and want more such activities to be carried out in their area They also expressed their dissatisfaction towards the Lacesdial attitude from the authorities and non involvement from government agencies and secondly their lack of integration among themselves towards the issues. When asked how they themselves could improve their living condition by adopting various O&M schemes which can solve the basic issues there were various mixed response to that, Overall outcome of the meeting was very good and people expressed their willingness to share the responsibilities in form of shramdan or various activities in form of Public awareness.

Appendix D

Minutes of the Workshop – Allahabad

Place: Commissioner Sabha Ghar, Mumford Ganj, Allahabad. UP
Date: 16 December 2004.
Time: 1600 Hours to 1900 Hours
Guest of Honour: Dr. Lalit Verma. Commissioner Allahabad.
Client: Mr. Hirotako Sato, Mr. Ajai Singh. JICA and TEC.
Team Members: Shri Arun Kumar, Brig (Dr.) UD Dubey, Mr. S Vijaykrishnan, Mr Anuj Sharma, Mr Shishir Lal, Mr. Utparn Dubey, Mr. Nitin Srivastava.
Other Participants: 54 participants List attached.
Medium Used for Presentation: Power point slides in Hindi were used to explain the outcome of the feasibility study using LCD Projector and Round table conference. P A system.

Views and Comments aired during the Workshop at Allahabad

Dr. Lalit Verma (Chief Guest) : Dr Verma welcomed the JICA and project team and thanked them for their extensive work to prepare the feasibility study for Non sewerage schemes for pollution abatement. He stressed on awareness program and education development to make any plan successful. He said that we have to work from the grassroots level and also have to be aware about the do and don't of the sanitation program. He emphasised on proper involvement of the Nagar Nigam and community at the same platform and asked the nagar Nigam officials to cooperate as far as possible. He asked the project team to define the structure of the program in such a manner that it can be viable and sustainable. He emphasised on the need to develop Toilet complexes for catering to the slum population in which people are involved, keeping in mind the overall infrastructure. He also said that lots need to be done at policy level. Though the government is spending lot of money on LCS but still there is a huge gap which needs to be provided for.

1. Dr. S N Pathak Project Director UPHSDP

- Initiatives to stop open defection
- Rivers are already polluted. What action is being taken?
- Problem related to cremation practices.
- IEC Programme should include priests as primary stake-holders.

2. Kamlesh Singh, Corporator

- Main difficulty or drawback is poor Operation & Maintenance.
- Temporary toilets during "Melas" – example of "Syntax" toilets used in Amaranth (reference given by Mr Mishra, Engineer, DUDA).
- Current status is that about 57 nullahs / open drains "dispose" their waste water into Ganga amounting to about 210 MLD.
- For river cleaning, use of tortoise breeding should be encouraged and brought back as they eat up the large amount of filth and matter from the river so we should release them into the river.
- According to him, there is no financial problem, but the money being charged from the facility user is not accounted for and same is being not used for buying material required to maintain the complex.
- Reference of Bairawa Complex given for gas plant being used generation of electricity; use of Goober as additional input of which large quantities being disposed directly into open drains.
- Sewerage system essential (e.g. Salori) as in most areas direct disposal is open drain / nallah.

3. Mr Sharan, DG Railways

- Need for carrying out intensive awareness programme to build civic sense and moral responsibility.
- Need for support organizations during construction –ward-wise assistance to CBOs.
- Focus should be first on LCS/CTC – other aspects of community development in 2nd phase.

4. Corporator

- Any development in Sewerage System should go hand-in hand with Solid Waste Management.
- River is full of non biodegradable plastics.
- Curtailment of Cattle wallowing.

5. CDS

Poverty / poor economic condition of the user does not allow the residents and thus they are unable to pay for) using CTCs.

5. IHLS

- Preferred but, Again people are so poor that they cannot afford even their part of contribution when asked to build under the Scheme by DUDA and secondly there are so much of Space restrictions (e.g. use of "RURA" Pan)
- However, HUDCO scheme for ____ funding of IHLS. (Upto Rs 1955/- as provided by Mr Mishra, DUDA).
- Nirmal Bharat Abhiyan – Scheme to resettle the Slums and Poor by constructing EWS
- More than or equal 20% rebate should be given for developing IHLS.

7. GM, Jal Sansthan - Allahabad

- Use of oxidation ponds should be priority and should be a part of all the development scheme in future as It is the best alternative.
- Land availability is a problem because as earmarked land has already been encroached upon and there is no one to rectify the same.
- Could be used in rural areas within the city admin jurisdiction areas.

8. Open Forum:

- Opposition to Mini Treatment Plant with the proposed CTC because erratic power supply will lead to ill maintenance and thus it will be a failure.
- User paying for the facility usage is a difficult proposition because of the economic situation of the individual or the family thus these services should be made free.
- CDS requested the team to focus on sewerage system and water supply (e.g. Bahadurganj there exists a very old Sulabh CTC facility but lying waste due to improper, water supply and cleaning) so in order to make any thing successful we need to improve the services first.

9. Open Forum: Rajapur

Inadequate space for sewerage system, but

Outcome: Various comments and suggestion were received during the workshop with the stakeholders and participants aired their acceptance and dissatisfaction over the present system and welcomed the approach presented by the project team for the betterment of the community. Over all it was a successful presentation and whatever suggestion and comments after proper filtration usefull to the feasibility study purpose have been incorporated with the Final report.

Appendix E

Attendance :
NON SEWERAGE WORKSHOP ALLAHABAD
16 DECEMBER 2004

S.No.	NAME	DESIGNATION/ ADDRESS
1	Dr Lalit Verma	Mandal Ayukta
2	Arun Kumar	Project Team Leader
3	Dr. S.N.Pathak	Pariyojana Prabandhak, U.P. H.S.D.P. Allahabad
4	E.P. Mishra	Sahayak Abhiyanta, U.P. H.S.D.P. Allahabad
5	R.K.Arya	Sanyukta Sachiv Allahabad, Vikas Pradhikaran
6	R.C. Srivastava	Upanagar Aayukta, Nagar Nigam, Allahabad
7	Rashid Ahmad Khan	General Manager, Allahabad Jal Sansthan
8	R.B.Singh	Excutive Engineer Jal Sansthan
9	Shoaib Ahmad	A.P.O. DUDA Allahabad
10	S.D. Rai	P.O. DUDA Allahabad
11	M.K. Gupta	Jr. Engineer DUDA Allahabad
12	P.K. Mishra	J.E. DUDA Allahabad
13	Silawati Singh	C.D.S.DUDA Allahabad
14	Abha Devi	C.D.S. DUDA Allahabad
15	Usha Kesarvani	C.D.S. DUDA Allahabad
16	Vidyawati Bharti	C.D.S. Adhyaksha
17	Ram Narayan Verma	Pramukh Mukhya Engineer, Uttar Madhya Railway
18	Amar Nath	Mukhya Vidyut Abhiyanta, Uttar Madhya Railway, Allahabad
19	Vihangesh Bharan	Mahaprabandhak, Ganga Pradushan Niyantran Unit, Allahabad
20	Bri. Dr. U.D.Dubey	Public Health Expert
21	Ajay Kumar Singh	Varishtha Karyakram Adhikari, JICA Study Team
22	Hirotaka Sato	JICA Study Team
23	Umesh Chandra Jaysawal	Parshada N.N. . Allahabad
24	Kamlesh Singh	Parshada N.N. Allahabad
25	S. Vijay Krishan	Director (Operations) Haskoning India Private Limted
26	Shishir Lal	Project Team
27	Anuj Sharma	Senior Planner Haskoning India Private Limted
28	Utparn Dubey	Project Team

Appendix F

NON SEWERAGE WORKSHOP
ALLAHABAD
16 DECEMBER 2004

LIST OF PARTICIPANTS

S.NO क्र.सं.	NAME नाम	DESIGNATION/ ADDRESS पद / पता	SIGNATURE हस्ताक्षर
1.	डॉ० एस० एन० पाठक	परियोजना प्रबन्धक यू० पी० एस० एस० डी० पी० इलाहाबाद	[illegible]
2.	डॉ० पी० मिश्रा	सहायक अभियन्ता यू० पी० एच० एस० डी० पी० इलाहाबाद	[illegible]
3.	आर० के० आर्य	संयुक्त सचिव इलाहाबाद विकास प्राधिकरण	[illegible]
4	एम० सी० श्रीवास्तव	उप नगर आयुक्त नगर निगम इलाहाबाद	[illegible]
5.	Reshid Ahmed Khan	General Manager Allahabad Jal Sastha	[illegible]
6.	R. B. Singh	Executive Engineer Jal Sansthan	[illegible]
7.	शौकत अहमद	A.P.D. सूडा इलाहाबाद	[illegible]
8.	S. D. Roy	P.O. Duda ALD	[illegible]
9.	M. K. Gupta	Jr. Engineer Duda Alld.	[illegible]
10	P. K. Mishra	J. E. DUDA Alld.	[illegible]
11-	Lilawati singh	C.D.S. DUDA Alld	[illegible]
12-	आभादेवी	C.D.S. DUDA Alld	आभादेवी
13-	कृष्णा केसरवानी	C-D-S- DUDA Alld	कृष्णा केसरवानी
14-	विद्यावती भारती	C-D-S- अटरसुइया	विद्यावती

NON SEWERAGE WORKSHOP - ALLAHABAD
16 DECEMBER, 2004

S.No. क्र.सं.	NAME नाम	DESIGNATION/ADDRESS पद / पता	SIGNATURE हस्ताक्षर
1.	राम नारायण वर्मा	प्रमुख मुख्य इंजीनियर, उत्तर मध्य रेलवे	
2.	अमर नाथ	मुख्य विद्युत अभियन्ता, उत्तर मध्य रेलवे इलाहाबाद	
3.	विद्येश शरन	महाप्रबन्धक, गंगा प्रदूषण नियंत्रण	
4.	ब्रिगे० डा० एस० डी० दुबे	पब्लिक हेल्थ एक्सपर्ट	
5.	अजय कुमार सिंह	वरिष्ठ कार्यक्रम अधिकारी, जापान अध्ययन दल	
6.	Hirotaka Sato	JICA STUDY TEAM	
7-	उमेश चन्द्र जायसवाल	(पार्षद न० नि० इला०	
8	[illegible] सिंह	पार्षद न० नि० [illegible]	
9	एस० विजय कृष्णन	हास्कोनिंग	
10	शिशिर लाल	प्रोजेक्ट टीम	
11	अनुज शर्मा	हस्कोनिंग	अनुज शर्मा
12	ललित वर्मा	मंडलायुक्त	
13	अरुण कुमार	प्रोजेक्ट टीम	

Appendix G

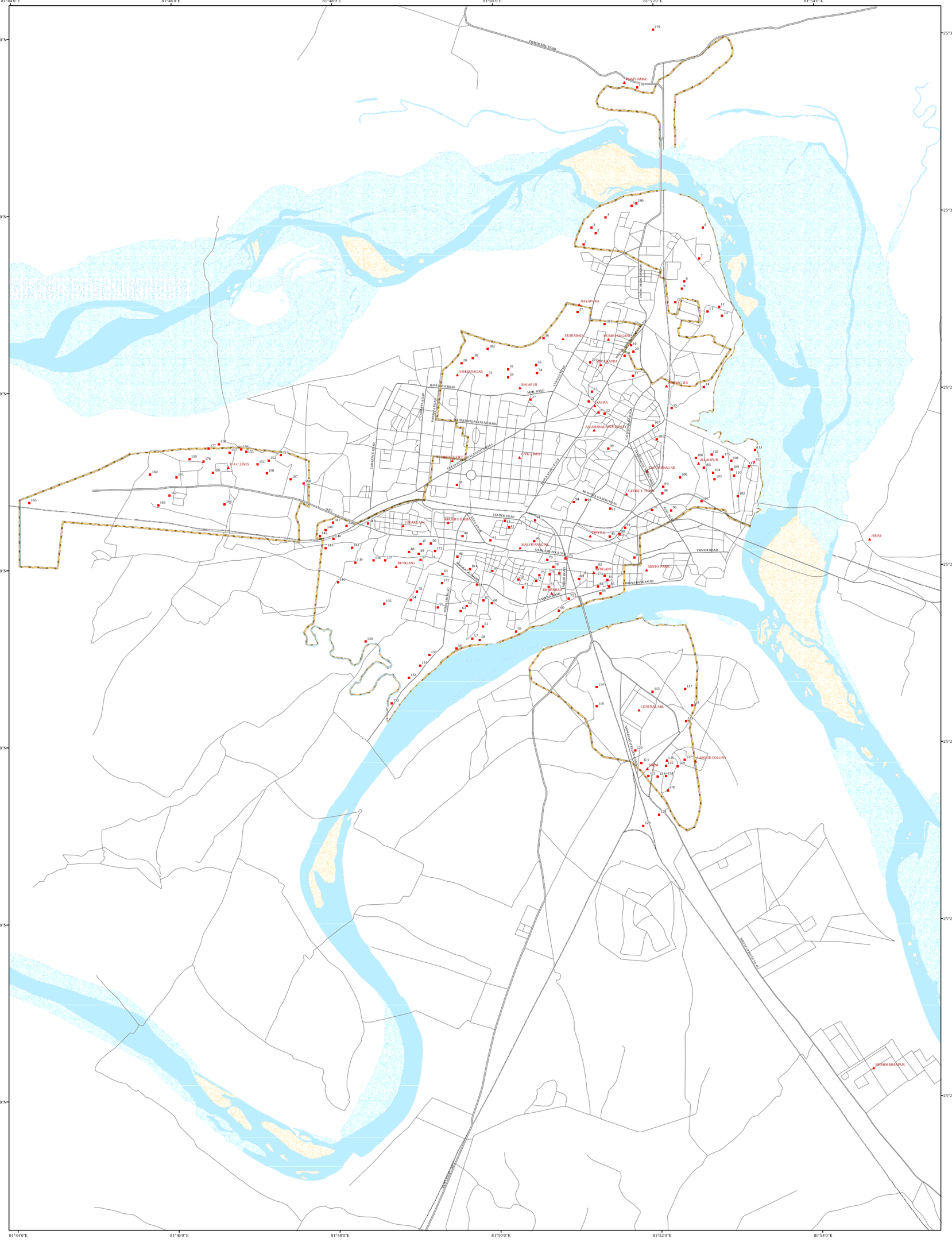
Demographic Profile of Allahabad

Area Profile							
				Household size			7.0
Number of Household			740,941	Proportion of Urban population (%)			24.4
	P	M	F	Sex Ratio (Female per 1000 males)			879
Population-Total	4,936,105	2,626,448	2,309,657	Sex Ratio (0-6 Years)			917
Population-Rural	3,729,320	1,962,425	1,766,895	Sex Ratio (SC)			898
Population-Urban	1,206,785	664,023	542,762	Sex Ratio (ST)			828
Population (0-6)	899,583	469,206	430,377		P	M	F
SC Population	1,065,097	561,115	503,982	Proportion of SC population (%)	21.6	21.4	21.8
ST Population	4,273	2,337	1,936	Proportion of ST population (%)	0.1	0.1	0.1
Number of Literates	2,506,942	1,635,387	871,555	Literacy Rate (%)	62.1	75.8	46.4
Number of Illiterates	2,429,163	991,061	1,438,102	Illiteracy Rate (%)	60.2	45.9	76.5
Total Workers	1,671,349	1,138,987	532,362	Work participation rate (%)	33.9	43.4	23.0
Main workers	1,106,598	895,014	211,584	Proportion of Main Workers (%)	22.4	34.1	9.2
Marginal workers	564,751	243,973	320,778	Proportion of Marginal Workers (%)	11.4	9.3	13.9
Non workers	3,264,756	1,487,461	1,777,295	Proportion of Non Workers (%)	66.1	56.6	77.0
Cultivators	537,183	360,865	176,318	Proportion of cultivators to total workers (%)	32.1	31.7	33.1
Agricultural labourers	419,578	211,188	208,390	Proportion of agricultural labourers to total workers (%)	25.1	18.5	39.1
Workers in household industries	161,411	90,451	70,960	Proportion of workers in household industries to total workers (%)	9.7	7.9	13.3
Other workers	553,177	476,483	76,694	Percentage of Other workers to total workers (%)	33.1	41.8	14.4

P- Total population, M- Male, F-Female

Source-Census 2001

Appendix H



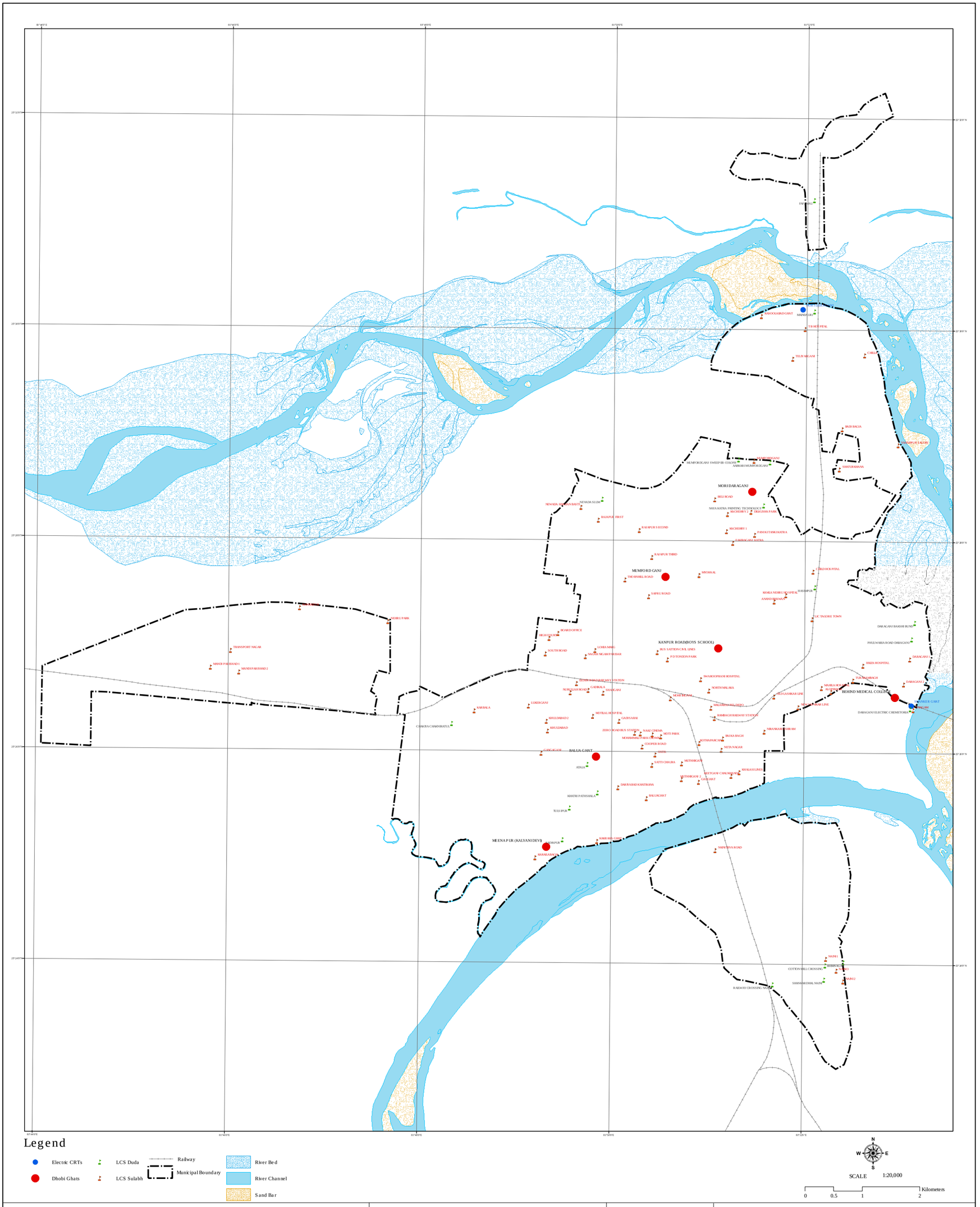
Legend

- Slums
- Major Locality
- Arterial Road
- City Major Road
- State Highway
- National Highway
- Railway Track
- River Bed
- River Channel
- Sand Bar
- Municipal Boundary

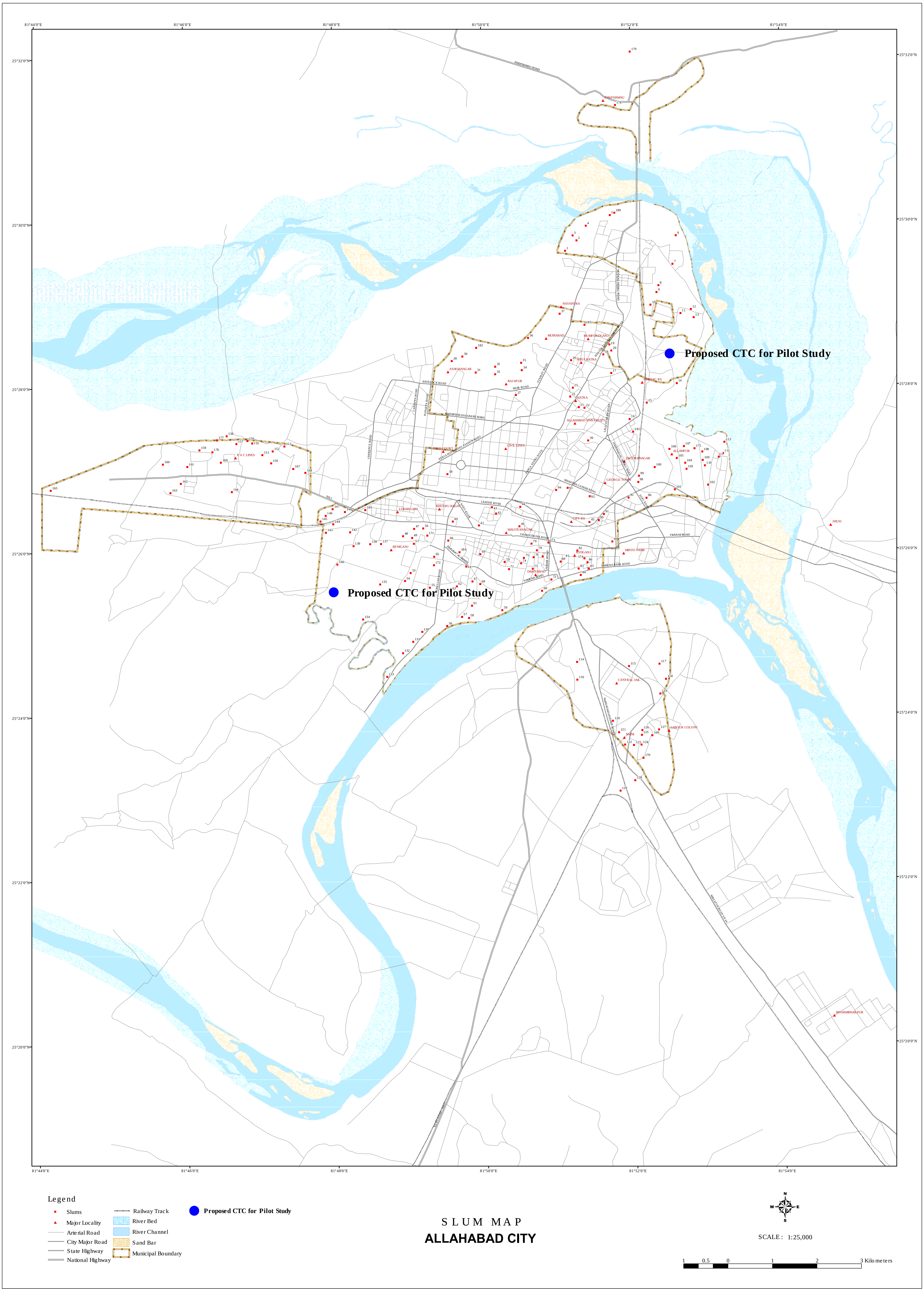
SLUM MAP
ALLAHABAD CITY

SCALE : 1:25,000

1 0.5 0 1 2 3 Kilometers



JAPAN INTERNATIONAL COOPERATION AGENCY TOKYO ENGINEERING CONSULTANTS CO.,LTD. CTI ENGINEERING INTERNATIONAL CO.,LTD.	PROJECT	LOCATION	FIGURE
	THE STUDY ON WATER QUALITY MANAGEMENT PLAN FOR GANGA RIVER IN THE REPUBLIC OF INDIA	ALLAHABAD CITY	LOCATION OF LCS , GHATS & ELECTRIC CREMETORIA


SLUM MAP
ALLAHABAD CITY
Legend
Slums
Major Locality
Arterial Road
City Major Road
State Highway
National Highway
Railway Track
River Bed
River Channel
Sand Bar
Municipal Boundary
Proposed CTC for Pilot Study
Proposed CTC for Pilot Study
Proposed CTC for Pilot Study
SCALE : 1:25,000
1 0.5 0 1 2 3 Kilometers

Appendix I

ID	NAME
1	Ponghut (Harijan Basti)
2	Lal Vihara
3	Neam Sarai
4	Begem Sarai
5	Mundera Village
6	Pughut Jushwaha Basti
7	Malak Raj
8	Beharana (Holi Pali Gali)
9	Govindpur Chillaha
10	Big Bagiya
11	Suraj Hata
12	Saraj Nagar
13	Harwara
14	Meera Patti
15	Gayasudin Pur
16	Bhagalpur Harwara
17	Jairam Pur (Harijan Basti)
18	Jairam Pur Patpar
19	Bharati Nagar Rajapur
20	Neeratul
21	Maheela Gram BSP
22	Dariyabad Malin Basti
23	Krishan Nagar
25	Jahangirabad Malin Basti
26	Ambedkar Nagar
27	Kharwani
28	Fathehapur Bichhua
30	Karelabag Malin Basti
31	Madaripur
32	Kanpur Road (Near High Cour
33	Ramman Ka Purwa
34	Khariya
35	Bhola Ka Purwa
36	Sulem Sarai Bazar
37	Ganga Canal
38	Newada
39	Mausariya
40	Sadiyapur
41	Karelabag Balu Market
42	Katghar Mehantrana Malin Ba
43	Chota Baghada
44	Dharhiya (Alanganj)
45	Purana Phaphamau Village
46	Matadin Ka Purwa
47	Shivkuti

ID	NAME
48	Kumhara Gadwa (Allahapur)
49	Dariyabad Malin Basti (Seco
50	Sultanpur Bhawa Malin Basti
51	Uchawa Gadi Malin Basti
53	Trivani Nagar
54	Bhim Nagar
55	Udoyg Nagar
56	Kanjipur
57	Mahara Ka Purwa
58	Dube Ka Talab
59	Naini Village
60	Salori Malin Basti
61	Om Gayatri Nagar
62	Madhawapur
63	Sohbatiya Bagh
64	Tularam Bagh
65	Jaynati Pur
66	Umarpur Neewa
67	Aabubakarpur
68	Bhakatana Jaynatipur
69	Karelabagh Malin Basti
70	Dakshin Lokpur
71	Purafateh Mohamad
72	Uttari Lokpur
73	Chakdhaundhi
74	Sugar Mill Pasiyana
75	Chakfaijulla
76	Kali Badi
77	Pitambar Nagar
78	Shankar Ghat
79	Azad Nagar
80	Jodhwal Pariyana
81	Naya Gaon Rasulabad
82	Mehandori
83	Chak Raghunath
84	Mohatsim Ganj
85	Darbhnaga Castle
86	Muthiganj Chamrauti
89	Mahavirn Gali Basti
90	Mahaviran Speekar Basti
91	North Malaka
92	Malviya Nagar
93	Meenapur
94	Sariya Bakshi Khurd
95	Ganga Ganj

ID	NAME
96	Mori Daraganj
98	Ghariwan Tola
99	Bhusuli Tola
100	Katara Bakhtiyari
101	Gau Ghat
102	Alopibagh
103	Tulsipur
104	Rasulpur
105	Shastri Nagar
106	Beniganj
107	Karbala
108	Gaddikalan
109	Gaddi Sarai
110	Bahadurganj (Thakurdin Ka H
111	Batganj Dharkar
112	Pura Dhaku Malin Basti
113	Ellaiebagh Lukarganj
114	Khatri Pathshala Anshuiya
115	Bhagwat Jagdish Bagh
116	Antrashuia Lala Harijan Bas
117	Bhadasahi Mandi
118	Chaukhandi Malin Basti
119	Yamuna Bank Road
120	Mayurabad
121	Kydiganj Sweeper Basti
122	Naya Katra Mehatrana
123	Katara Pasiyana
124	Fakiranganj Katra
125	Himmat Ganj
126	Neehalpur
127	Pura Dalel
128	Gulab Badi
129	Shaganj
130	Trivani Nagar (Allahapur)
131	Sudarshan Samaj Basti
132	Phulwaria Road
133	Naya Gaon Allahapur
134	Sanjay Nagar Allahapur
135	Naya Basti
137	Chaukhandi Dilwa Basti
138	Chaukhandi Mallahi Basti
139	George Town
140	Minto Road Harijan Basti
142	Gadiya Tola (Muthiganj)
143	Naya Purwa Kareli
144	Baluha Basti Nurulla Road
145	Keedganj Neta Nagar
146	Cheetpura
147	Katarimanshari Phulwaria
148	Rajpapur
149	Kaushambhi Road
150	Subedaganj
151	Rampriya Road (Behind Stati
152	Kareli
153	Tilak Nagar Allahapur
154	Nai Basti Sotbathiya Bagh
155	Kailashpuri (Salori)
156	Rasulabad
157	Kamla Nagar Naya Purwa
158	Naya Purwa (Mumford Ganj)
159	Rajapur
160	M.Z. Road Katra
161	Bank Road Katra
162	Bathambari Gaddi (Allahapur
163	Bakshi Kalan (Dara Ganj)
164	Bakshi Khurd (Dara Ganj)
165	Chak Matai (Naini)
166	Beli Gaon
167	Bhawapur (Himmatganj)
168	Kanhaipur (Pritamnagar)
169	Kakraha Ghat (Sadiyapur)
170	Kala Danda (Himmatganj)
171	Unani Medical Behind Himmat
172	Gosh Nagar Kareli
173	Mattan Ka Purwa (Bakiya)
174	Tarbagh (Nehra Park)
175	Naya Baharana
176	Bhulai Ka Purwa
177	Chakiya Nai Basti
178	Gangaganj
179	Poptala
180	Mission Road Peepal Wali Ga
181	on Road M.Z. Line 15 Malin
182	on Road M.Z. Line 12 Malin
183	Harshwardhan Nagar Meera Pu
184	Bergad Ghat Meera Pur

Appendix J

Ground Water Quality : Allahabad

S. No	Location	E.C micro siemens/cm at 25°C	pH	Cl	NO_3	F
1	Sirthu	1250.0	8.4	185.0	170.0	Nil
2	Seorajpur	400.0	8.0	43.0	43.0	Nil
3	Dhyamaganj	1490.0	8.3	142.0	39.0	0.1
4	Iavaon	913.0	8.0	64.0	16.0	2.0
5	Phulpur	2090.0	8.4	107.0	47.0	1.4
6	Handia	750.0	8.0	64.0	2.2	0.5
7	Meja	300.0	8.0	35.0	15.0	Nil
8	Karchngi	410.0	8.0	14.0	7.0	Nil
9	Manaimy	1020.0	8.2	156.0	58.0	Nil
10	Bikapur	800.0	8.0	50.0	45.0	Nil
11	Malkahashar	515.0	8.0	106.0	16.0	0.1
12	Manda Road	580.0	8.0	21.0	17.0	0.9
13	Jasra	1000.0	8.3	106.0	127.0	0.1
14	Bara	2150.0	8.3	298.0	125.0	Nil
15	Mahgaon	9100.0	8.4	1633.0	2810.0	Nil
16	Mugergan	1550.0	8.4	173.0	93.0	Nil
17	Holagarh	690.0	8.0	27.0	32.0	1.7
18	Imamganj	570.0	8.0	21.0	3.0	1.2
19	Kaushambhi	1250.0	8.2	121.0	87.0	0.1
20	Karaon	690.0	8.0	28.0	4.0	Nil
21	Lehdari	1040.0	8.3	142.0	5.0	Nil
22	Kunda	480.0	8.0	21.0	4.0	Nil
23	Sangramgarh	400.0	8.0	14.0	2.0	Nil
24	Rampur	582.0	8.1	21.0	2.0	0.3
25	Lalganj	598.0	8.1	7.0	8.0	Nil
26	Sangipur	1110.0	8.2	35.0	5.0	0.8
27	Kuagaon	600.0	8.0	14.0	3.0	Nil
28	Sarai Amido	500.0	8.0	28.0	1.0	0.1
29	Dihbalai	880.0	8.1	135.0	120.0	0.1
30	Kithover	590.0	8.1	14.0	19.0	0.2
	Desirable Limit		6.5-8.5	250.0	45.0	1.0
	Permissible Limit		no relaxation	1000.0	100.0	1.5

Source : Ground Water Year Book Uttar Pradesh, CGWB, Ministry of Water Resources Oct-04

BDL : Below Detectable Limit

Appendix K

Requirement of CTC in the slums of Allahabad

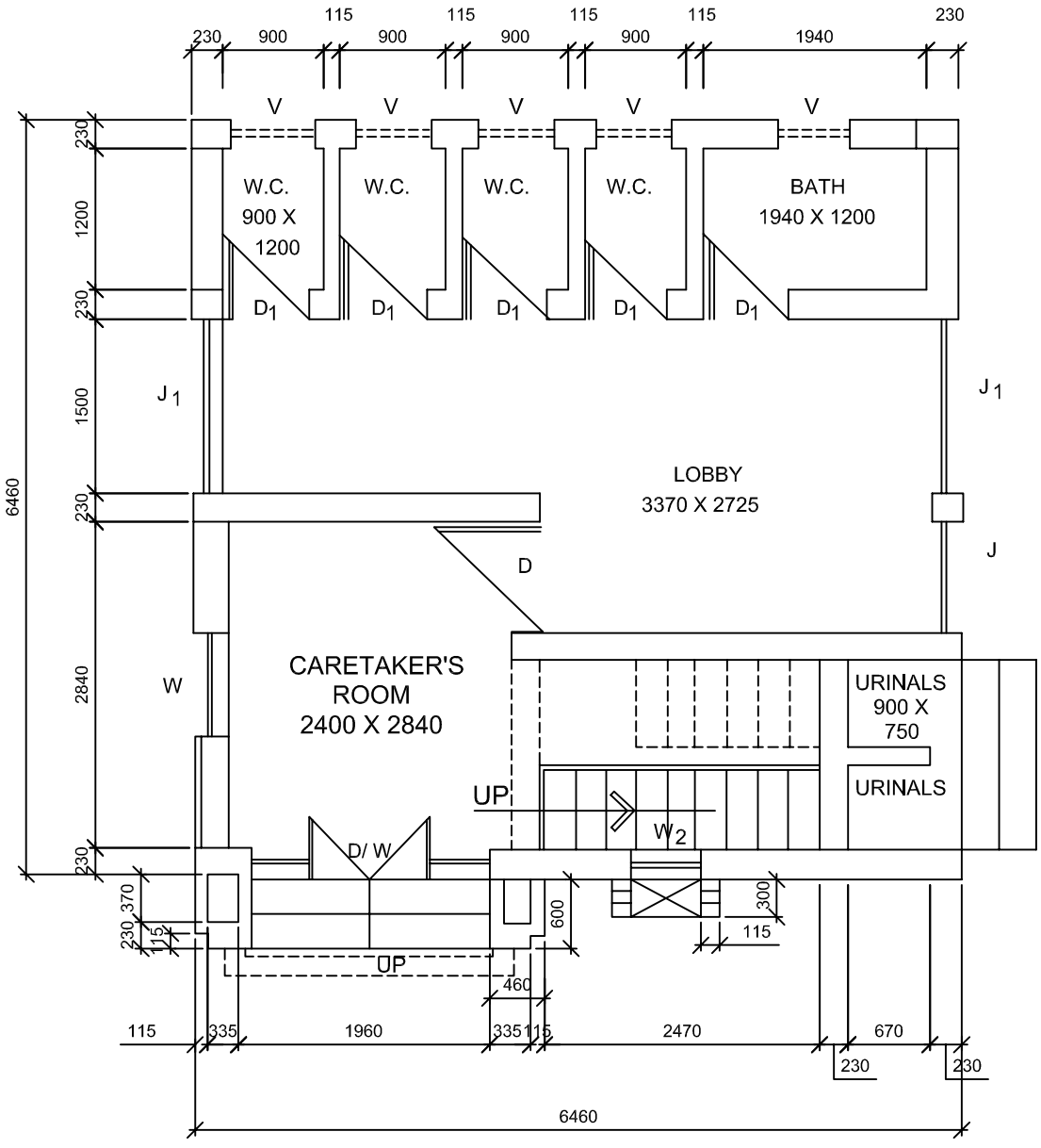
S.No.	Name Slum Area	Approximate Population	Population carrying Open Defecation	Willingness to pay	No. of Seats Required	Type of CTC		
			67	23	30	5 seater	10 seater	20 seater
1	Ponghut (Harijan Basti)	180	121	28	1	0	0	0
2	Lal Vihara	1400	938	216	7	1	0	0
3	Neam Sarai	1625	1,089	250	8	1	0	0
4	Begem Sarai	1270	851	196	7	1	0	0
5	Mundera Village	1578	1,057	243	8	1	0	0
6	Pughut Jushwaha Basti	1389	931	214	7	1	0	0
7	Malak Raj	5566	3,729	858	29		1	1
8	Beharana (Holi Pali Gali)	2880	1,930	444	15		1	0
9	Govindpur Chillaha	2918	1,955	450	15		1	0
10	Big Bagiya	1328	890	205	7	1	0	0
11	Suraj Hata	486	326	75	3	0	0	0
12	Saraj Nagar	1536	1,029	237	8	1	0	0
13	Harwara	2023	1,355	312	10		1	0
14	Meera Patti	2192	1,469	338	11		1	0
15	Gayamudin Pur	1608	1,077	248	8	1	0	0
16	Bhagalpur Harwara	1689	1,132	260	9		0	0
17	Jairam Pur (Harijan Basti)	2874	1,926	443	15		1	0
18	Jairam Pur Patpar	2462	1,650	380	13		1	0
19	Bharati Nagar Rajapur	1981	1,327	305	10		1	0
20	Chak Neeratul (Kasari Masari)	2100	1,407	324	11		1	0
21	Maheela Gram BSP	2156	1,445	332	11		1	0
22	Pariyabad Malin Basti (Village)	3650	2,446	563	19			1
23	Krishan Nagar	6351	4,255	979	33		1	1
24	Mamayraganj Sweeper Basti	517	346	80	3	0	0	0
25	Jahangirabad Malin Basti	2251	1,508	347	12		1	0
26	Ambedkar Nagar	2840	1,903	438	15		1	0
27	Kharwani	2211	1,481	341	11		1	0
28	Fathehapur Basupa	1500	1,005	231	8	1	0	0
29	Lakhimpur Road Malin Basti	100	67	15	1	0	0	0
30	Karelabag Malin Basti	2800	1,876	431	14		1	0
31	Madaripur	2021	1,354	311	10		1	0
32	Kanpur Road (Near High Court)	300	201	46	2	0	0	0
33	Ramman Ka Purwa	2850	1,910	439	15		1	0
34	Khariya	2900	1,943	447	15		1	0
35	Bhola Ka Purwa	2937	1,968	453	15		1	0
36	Sulam Sarai Bazar	2867	1,921	442	15		1	0
37	Ganga Canal	5550	3,719	855	29		1	1
38	Newada	2932	1,964	452	15		1	0
39	Mausariya	5330	3,571	821	27	1		1
40	Sadiyapur	2526	1,692	389	13		1	0
41	Karelabag Balu Market	1237	829	191	6	1	0	0
42	Katghar Mehantrana Malin Basti	146	98	23	1	0	0	0
43	Chota Baghada	1155	774	178	6	1	0	0
44	Tarheriya (Alanganj)	2573	1,724	397	13		1	0
45	Purana Phaphamau Village	5949	3,986	917	31		1	1
46	Matadin Ka Purwa	5941	3,980	915	31		1	1
47	Shivkuti	586	393	90	3	0	0	0
48	Kumhara Gadwa (Allahapur)	2000	1,340	308	10		1	0
49	Dariyabad Malin Basti (Second)	2665	1,786	411	14		1	0
50	Sultanpur Bhawa Malin Basti	3837	2,571	591	20			1
51	Uwawa Gadi Malin Basti	1823	1,221	281	9		0	0
52	Pali Village Malin Basti	3380	2,265	521	17			1
53	Trivani Nagar	5525	3,702	851	28		1	1
54	Bhim Nagar	1651	1,106	254	8	1	0	0
55	Udoyg Nagar	4326	2,898	667	22			1
56	Kanjipur	1826	1,223	281	9		0	0
57	Mehar Ka Purwa	1286	862	198	7	1	0	0
58	Dube Ka Talab	2100	1,407	324	11		1	0
59	Nani Village	1852	1,241	285	10		1	0
60	Salori Malin Basti	2862	1,918	441	15		1	0
61	Om Gayatri Nagar	3100	2,077	478	16			0
62	Madhawapur	657	440	101	3	0	0	0
63	Sohbatiya Bagh	1015	680	156	5	1	0	0
64	Tularam Bagh	2739	1,835	422	14		1	0
65	Jaynati Pur	3281	2,198	506	17			1
66	Umarpur Neewa	1351	905	208	7	1	0	0
67	Aaburpur	1995	1,337	308	10		1	0
68	Bhakatana Jaynatipur	1500	1,005	231	8	1	0	0
69	Karelabagh Malin Basti	300	201	46	2	0	0	0
70	Daskhin Lokpur	1786	1,197	275	9		0	0
71	Purafoh Mohamad	540	362	83	3	0	0	0
72	Uttari Lokpur	1265	848	195	7	1	0	0
73	Pakarduandi	1141	764	176	6	1	0	0
74	Sugar Mill Pasiyana	1335	894	206	7	1	0	0
75	Pakpayjulla	1681	1,126	259	9		0	0

S.No.	Name Slum Area	Approximate Population	Population carrying Open Defecation	Willingness to pay	No. of Seats Required	Type of CTC		
76	Kali Badi	182	122	28	1	0	0	0
77	Pitambar Nagar	2538	1,700	391	13		1	0
78	Shankar Ghat	2970	1,990	458	15		1	0
79	Azad Nagar	1929	1,292	297	10		1	0
80	Jothwal Pariyana	3400	2,278	524	17			1
81	Naya Gaon Rasulabad	2910	1,950	449	15		1	0
82	Mehandori	1936	1,297	298	10		1	0
83	Pank Raghunath	1240	831	191	6	1	0	0
84	Mohayatsam Ganj	1500	1,005	231	8	1	0	0
85	Darbhnaga Kaysal	1792	1,201	276	9		0	0
86	Muthiganj Pamroti	1050	704	162	5	1	0	0
87	Madiya Tola	278	186	43	1	0	0	0
88	Sundar Ganj	856	574	132	4	0	0	0
89	Mahavir Nagali Tharkar Basti	956	641	147	5	1	0	0
90	Mahaviran Speekar Basti	1219	817	188	6	1	0	0
91	North Malaka	2599	1,741	400	13		1	0
92	Malviya Nagar	1247	835	192	6	1	0	0
93	Meenapur	1326	888	204	7	1	0	0
94	Sariya Bakshi Khurd	1258	843	194	6	1	0	0
95	Ganga Tola Basti	1946	1,304	300	10		1	0
96	Mori Daraganj	2050	1,374	316	11		1	0
97	Khunkhun Ka Piyala	1045	700	161	5	1	0	0
98	Ghariwan Tola	1329	890	205	7	1	0	0
99	Bhusuli Tola	2332	1,562	359	12		1	0
100	Katara Bakhtiyari	2251	1,508	347	12		1	0
101	Mau Ghat	1950	1,307	301	10		1	0
102	Alopibagh	1550	1,039	239	8	1	0	0
103	Tulsipur	2926	1,960	451	15		1	0
104	Rasulpur	2911	1,950	449	15		1	0
105	Shastri Nagar	2381	1,595	367	12		1	0
106	Beniganj	2993	2,005	461	15		1	0
107	Karbala	3085	2,067	475	16			0
108	Gadhikala	2175	1,457	335	11		1	0
109	Gadhi Sarai	1030	690	159	5	1	0	0
110	Bahadurganj (Thakurdin Ka Hata)	1750	1,173	270	9		0	0
111	Batganj Dharkar	1750	1,173	270	9		0	0
112	Pura Taku Malin Basti	586	393	90	3	0	0	0
113	Ellaiebagh Lukarganj	659	442	102	3	0	0	0
114	Khati Pathshala Antrashuia	867	581	134	4	0	0	0
115	Bhagwat Jagdish Bagh	645	432	99	3	0	0	0
116	Antrashuia Lala Harijan Basti	1750	1,173	270	9		0	0
117	Bhadasahi Mandi	1750	1,173	270	9		0	0
118	Pauthandi Malin Basti	1029	689	158	5	1	0	0
119	Yamuna Bank Road	1129	756	174	6	1	0	0
120	Mura Baldi	1281	858	197	7	1	0	0
121	Katiganj Sweeper Basti	1750	1,173	270	9		0	0
122	Naya Katra Mehatrana	1100	737	170	6	1	0	0
123	Katara Pasiyana	1050	704	162	5	1	0	0
124	Pakiranganj Katra	1932	1,294	298	10		1	0
125	Himmat Ganj	1124	753	173	6	1	0	0
126	Neehalpur	1651	1,106	254	8	1	0	0
127	Pura Dalel	3400	2,278	524	17			1
128	Gulab Badi	1050	704	162	5	1	0	0
129	Shaganj	450	302	69	2	0	0	0
130	Trivani Nagar (Allahapur)	1989	1,333	307	10		1	0
131	Sudarshan Samaj Basti	1632	1,093	251	8	1	0	0
132	Phulwaria Road	1836	1,230	283	9		0	0
133	Naya Gaon Allahapur	1540	1,032	237	8	1	0	0
134	Sanjay Nagar Allahapur	1398	937	216	7	1	0	0
135	Naya Basti	928	622	143	5	1	0	0
136	Patel Dhilwa Basti	896	600	138	5	1	0	0
137	Paukhandi Dilwa Basti	627	420	97	3	0	0	0
138	Paukhandi Mallahi Basti	1290	864	199	7	1	0	0
139	Goreg Town	1283	860	198	7	1	0	0
140	Minto Road Harijan Basti	526	352	81	3	0	0	0
141	Shivpur Holi	2132	1,428	328	11		1	0
142	Gadiya Tola (Muthiganj)	1167	782	180	6	1	0	0
143	Naya Purwa Kareli	1228	823	189	6	1	0	0
144	Baluha Basti Nushulla Road	1096	734	169	6	1	0	0
145	Feedganj Neta Nagar	2826	1,893	435	15		1	0
146	Cheetpur	1932	1,294	298	10		1	0
147	Katarimanshari Phulwaria	1800	1,206	277	9		0	0
148	Rajpapur	2350	1,575	362	12		1	0
149	Kushambhi Road	1540	1,032	237	8	1	0	0
150	Subhdaganj	680	456	105	4	0	0	0
151	Sampriya Road (Behind Station)	580	389	89	3	0	0	0
152	Eniahdaudinpur (Kareli)	1650	1,106	254	8	1	0	0
153	Tilak Nagar Allahapur	1160	777	179	6	1	0	0
154	Nai Basti Sotbathiya Bagh	1450	972	224	7	1	0	0

S.No.	Name Slum Area	Approximate Population	Population carrying Open Defecation	Willingness to pay	No. of Seats Required	Type of CTC		
155	Kailashpuri (Salori)	1680	1,126	259	9		0	0
156	Rasulabad	1540	1,032	237	8	1	0	0
157	Kamla Nagar Naya Purwa	850	570	131	4	0	0	0
158	Naya Purwa (Mumford Ganj)	890	596	137	5	1	0	0
159	Rajapur	1450	972	224	7	1	0	0
160	M.Z. Road Katra	1350	905	208	7	1	0	0
161	Bank Road Katra	1250	838	193	6	1	0	0
162	Bathambari Gaddi (Allahapur)	2100	1,407	324	11		1	0
163	Bakshi Kala (Dara Ganj)	1350	905	208	7	1	0	0
164	Bakshi Khurd (Dara Ganj)	450	302	69	2	0	0	0
165	Chak Bhatai (Naini)	560	375	86	3	0	0	0
166	Beli Gaon	1150	771	177	6	1	0	0
167	Bhawapur (Himmatganj)	1150	771	177	6	1	0	0
168	Kanhaipur (Pritamnagar)	960	643	148	5	1	0	0
169	Kakraha Ghat (Sadiyapur)	480	322	74	2	0	0	0
170	Kalajhanda (Himmatganj)	1350	905	208	7	1	0	0
171	Unani Medical Behind Himmatganj	1250	838	193	6	1	0	0
172	Gosh Nagar Kareli	1150	771	177	6	1	0	0
173	Mattan Ka Purwa (Bakiya)	708	474	109	4	0	0	0
174	Taibaj (Nehra Park)	480	322	74	2	0	0	0
175	Naya Baharana	480	322	74	2	0	0	0
176	Bhulai Ka Purwa	1290	864	199	7	1	0	0
177	Wakiya Nai Basti	1890	1,266	291	10		1	0
178	Gangaganj	1250	838	193	6	1	0	0
179	Poptala	1305	874	201	7	1	0	0
180	Mission Road Peepal Wali Gali	1150	771	177	6	1	0	0
181	on Road M.Z. Line 15 Malin Basti	1975	1,323	304	10		1	0
182	on Road M.Z. Line 12 Malin Basti	780	523	120	4	0	0	0
183	Harshwardhan Nagar Meera Pur	550	369	85	3	0	0	0
184	Bergad Ghat Meera Pur	380	255	59	2	0	0	0
185	Bada Tajiya Near Malin Basti	1500	1,005	231	8	1	0	0
	Total	330157	221,219	50881	1696	71	59	**14**
					71/2 + 59 = 95		**95**	
	Total Requirement				5 seater is not recommended.			**109**

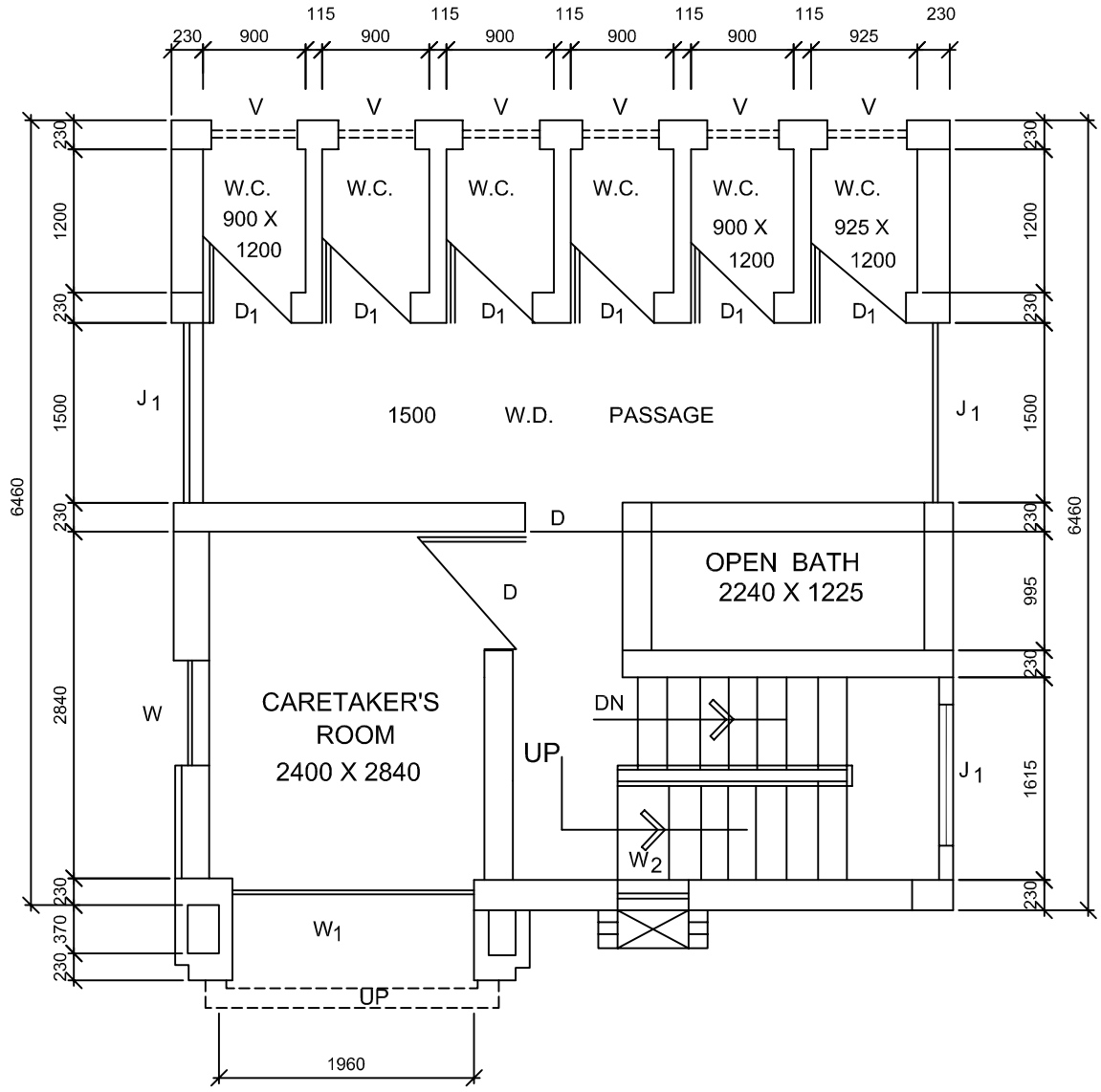
Appendix L

SCHEMATIC LAYOUT FOR 10 SEATER CTC

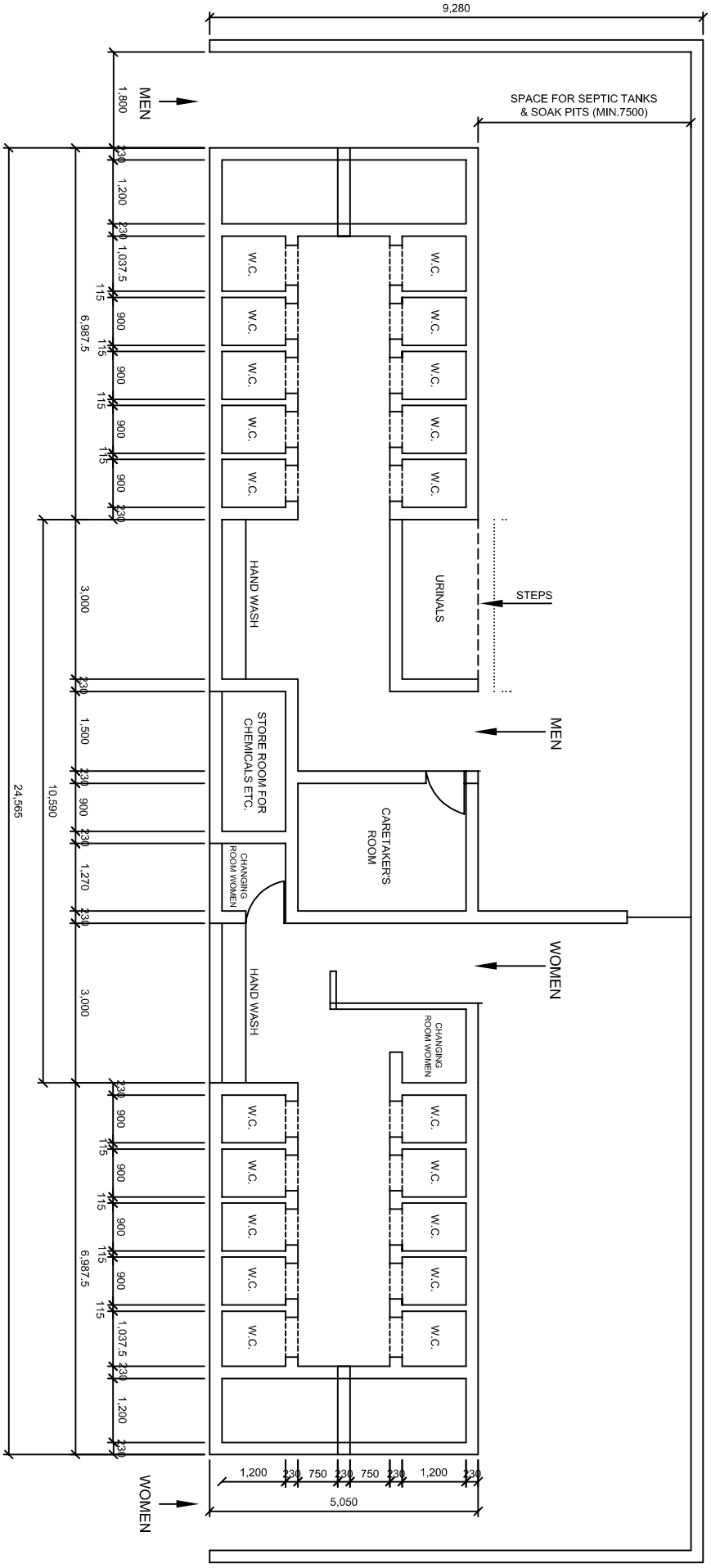


GROUND FLOOR PLAN

SCHEMATIC LAYOUT FOR 10 SEATER CTC



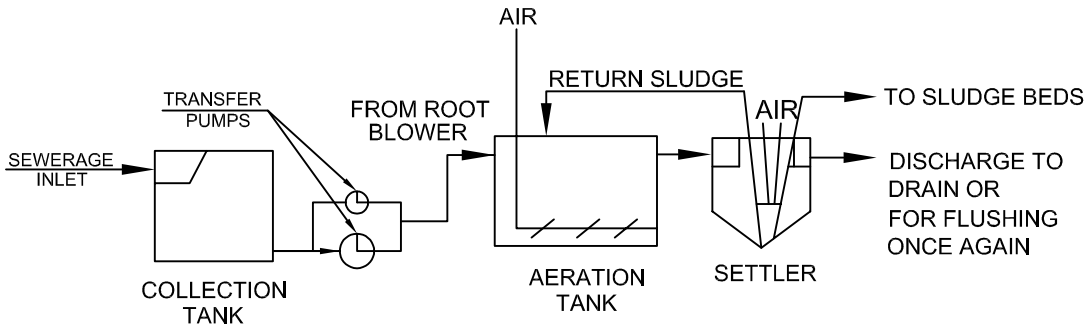
FIRST FLOOR PLAN



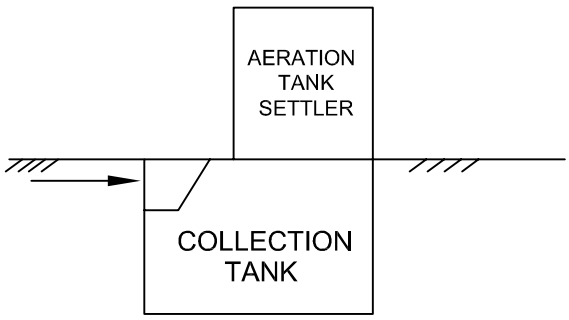
GROUND FLOOR

SCHEMATIC LAYOUT FOR 20 SEATER CTC

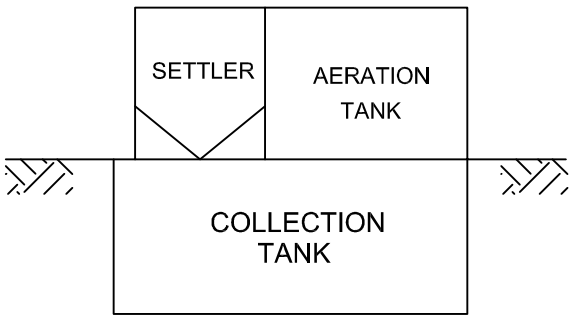
PROCESS FLOW FOR TREATMENT PLANT CTC



PLANT LAYOUT (GROUND LEVEL LOCATION)

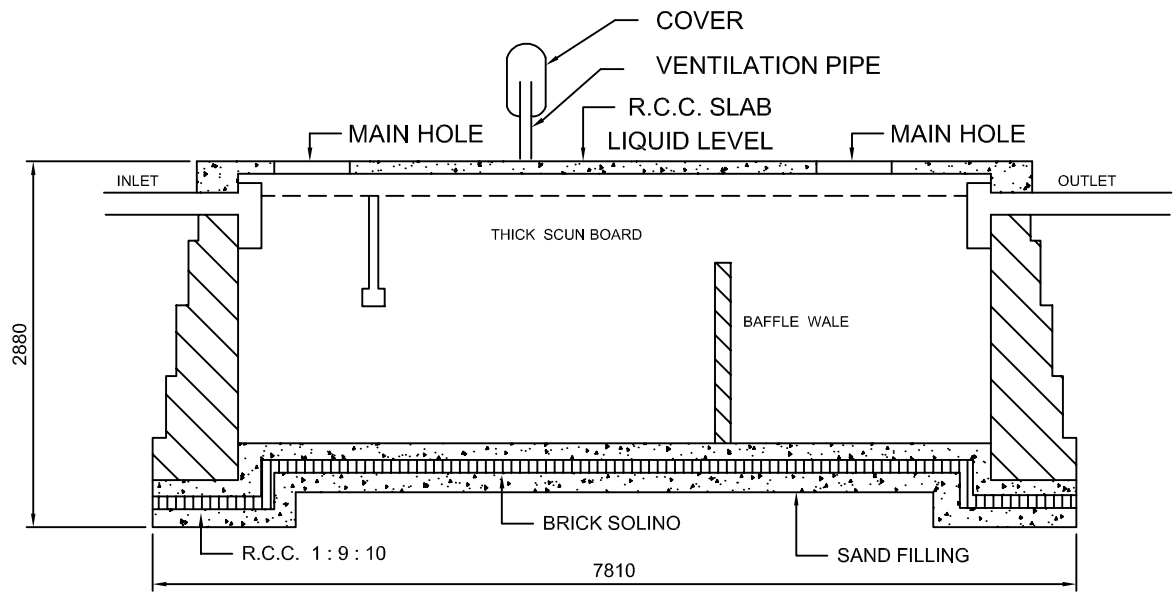


SIDE ELEVATION

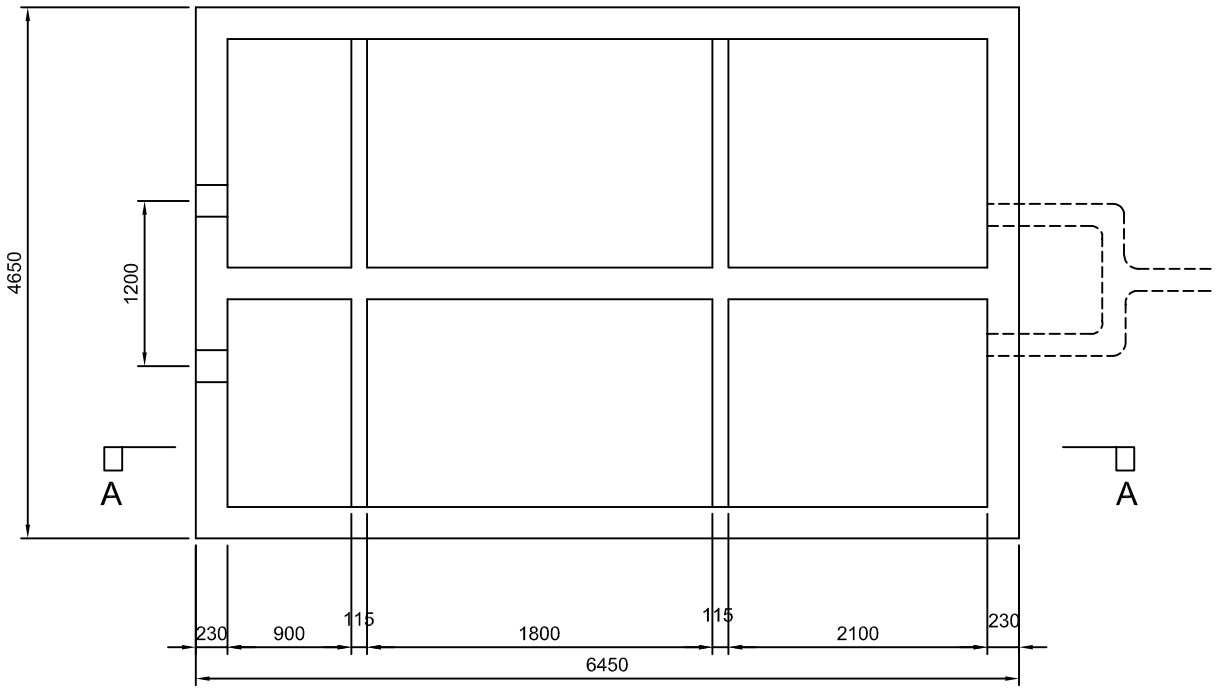


FRONT ELEVATION

SCHEMATIC PLANT LAYOUT FOR MINI - STP

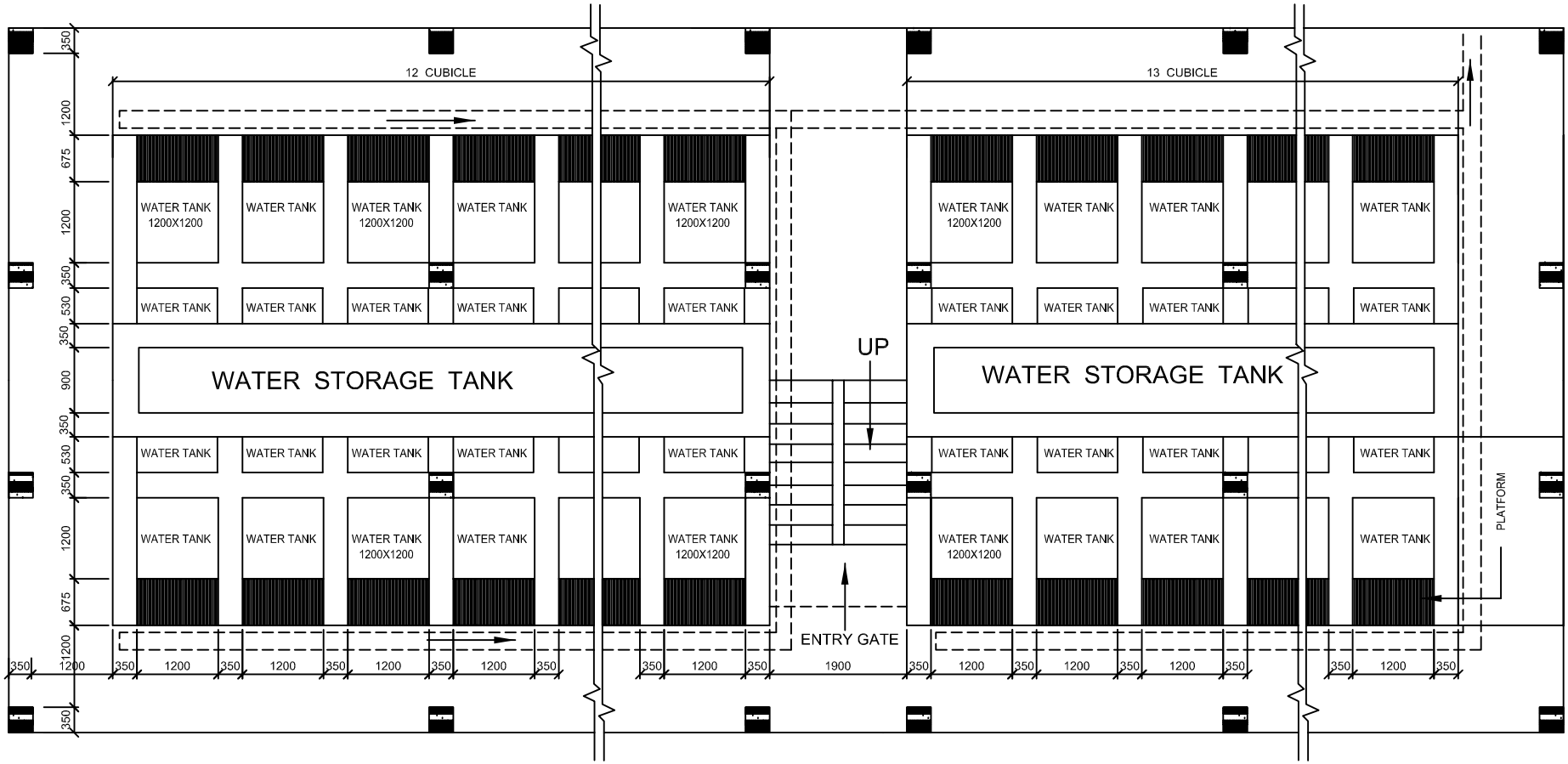


SECTION A - A



SCHEMATIC PLAN FOR SEPTIC TANK

SCHEMATIC LAYOUT FOR PROPOSED 50 CUBICLE DHOBIGHAT COMPLEX



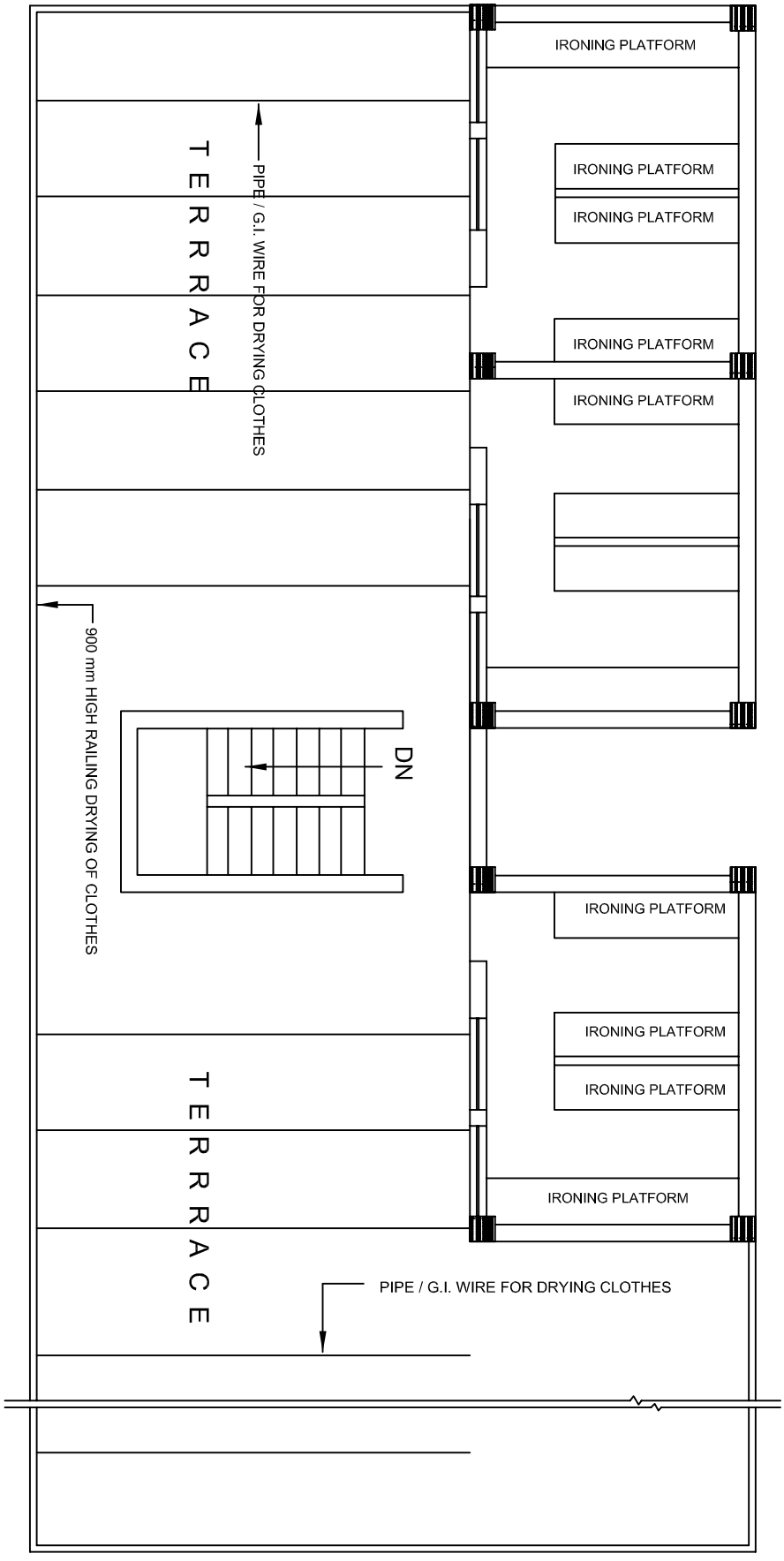
GROUND FLOOR PLAN

DESIGN OF DHOBI GHAT

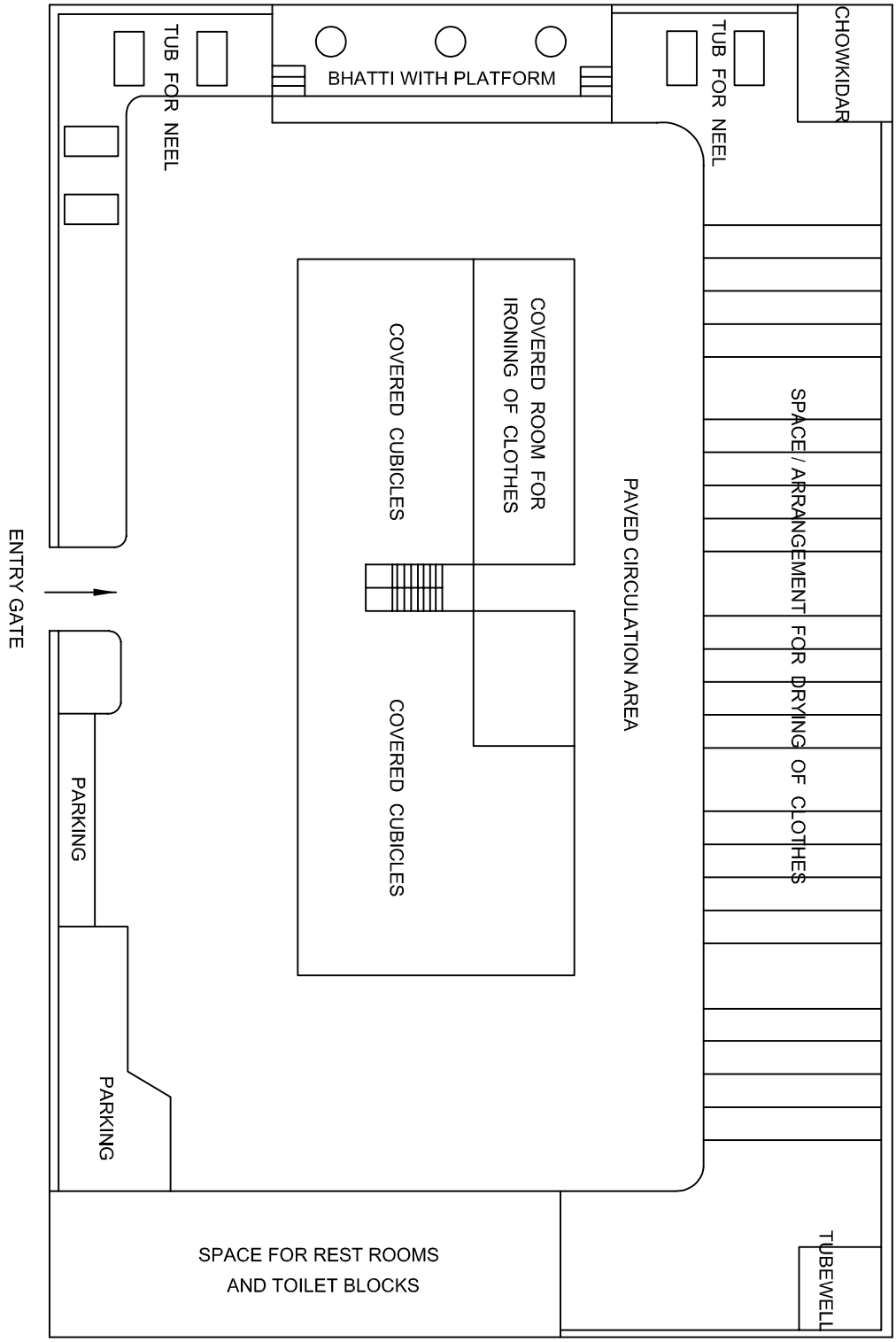
(OF 50 CUBICLES)

(WITH WATER STORAGE TANK)

SCHEMATIC LAYOUT FOR PROPOSED 50 CUBICLE DHOBIGHAT COMPLEX



FIRST FLOOR PLAN


SCHEMATIC LAYOUT SCHEME FOR 50 CUBICLE DHOBIGHAT COMPLEX
CHOWKIDAR
TUB FOR NEEL
BHATTI WITH PLATFORM
TUB FOR NEEL
SPACE / ARRANGEMENT FOR DRYING OF CLOTHES
COVERED ROOM FOR IRONING OF CLOTHES
COVERED CUBICLES
PAVED CIRCULATION AREA
COVERED CUBICLES
ENTRY GATE
PARKING
PARKING
SPACE FOR REST ROOMS AND TOILET BLOCKS
TUBEWELL

Appendix M

Table 5.3 : Anticipated Impacts and Proposed Mitigation Measures

Sr. No.	Environmental attribute	Potential impacts	Nature of Impact	Magnitude of Impacts			Mitigative measures	Implementation & Monitoring
				Low	Medium	High		
A.	Physical Resources							
1	Hydrology							
		Ground water table Depth of Groundwater varies from 2 to 20m.	Significant impact if soak pits are developed and potential leakages occurs from the latrines or sewer lines.		**X**		Proper lining and measures for avoiding the leakages should be undertaken. Provision for developing CTCs connected to sewer	During construction and operation phase
B.	Environmental Resources							
1.	Surface Water quality	Runoff from the CTCs leading to increase in BOD.	Direct/Local/ irreversible	**X**			Careful siting of CTCs, during operation of the CTCs the wastewater should have either preliminary treatment, or should be connected to the sewerage system.	Pre and Post construction activity
		Wastewater from Dhobighats during operation leading to increase in COD, BOD, oil & grease, etc.	Direct/Local/ irreversible	**X**			Should be connected to the local drains or sewerage systems and not allowed to flow or leak into the open areas	Post construction activity
4.	Soils and Geology	Wastewater leakages from septic tanks/soak pits	Direct/Local/ir reversible	**X**			Avoiding leakage, which are prone to the soil erosion. Rehabilitation and stabilization of disturbed land.	During and after the construction activity
D.	Human Environment							
1.	Health and Safety	Exposure to chemicals in Dhobighats.	Direct/Local/c ontinuous		**X**			After the construction phase.

Sr. No.	Environmental attribute	Potential impacts	Nature of Impact	Magnitude of Impacts			Mitigative measures	Implementation & Monitoring
				Low	Medium	High		
		Disease due to sanitation			X		Reduction in disease due to improvement in sanitary condition.	
3.	Socio-economics	Beneficial impacts from creation of CTCs which shall reduce open defecation.	Direct/regional			X	Overall industrial and economic growth of the region.	During operational phase
4.	Resettlement	Not anticipated		X			No mitigation required	

Appendix N

Preliminary Design Details for Mini STP for 5,10 & 20 Seater CTCs

Process to be followed	:	Extended Aeration
System Description	:	Consisting of: **A - Civil Works** ▪ Collection tank below ground ▪ Aeration tank on top of the CTC in RCC ▪ Solid / liquid phase separator in RCC near Aeration Tank ▪ Sludge Drying beds **B – Electro Mechanical Works** ▪ Transfer Pumps ▪ Air Blowers ▪ Air Diffusion system
Design Flow	:	5 Seater 6 – 7.5 m^3/d 10 Seater 12-25 m^3/d 20 SEater 24-30 m^3/d
Input Parameters	:	BOD = 300-350 mg/l COD = 600-300 mg/l S.S = 200-300 mg /l Oil & Grease (O&G) =10-20 mg/l
Output Parameters	:	BOD < 20 mg/l COD < 200 mg/l S.S < 100 mg/l O&G < 10 mg/l

The aeration tank, settler, the sludge beds and the blowers shall be located on the roof. The transfer pumps can also be located on the roof itself. The collection tank also will be at below ground, beneath the toilet seat with access from out side the Building.

The collection pump is considered for retention for minimum 16 hours with overflow drain connection of sewer line.

S No	Item Description	Unit	Material of Construction	5 Seat	10 Seater	20 Seater
	Estimated Flows	m^3	-	6-7.5	12-15	24-30
A.	**Civil Works**					
1.	Collection Tank	m^3	RCC	4.5	9.0	18.0
2.	Aeration Tank	m^3	RCC	4.5	9.0	18.0
3.	Settler (conical Bottom with launder)	m^3	RCC	2.2	3.5	7.0
4.	Sludge beds	m^2	Brickwork	2.0	3.0	5.0
B.	**Electro Mechanical Equipment**					
1.	Transfer pumps (2 nos)	No.	CI	1.0 m^3/ hr	1.0 m^3/ hr	2.0 m^3/ hr
2.	Blowers (2nos)	No.	CI	10.0 m^3/ hr	20.0 m^3/ hr	40.0 m^3/ hr
3.	Electric Control Panel for two Blowers and two pumps	No.		1	1	1
C.	**Power Equipment Kwh/d**	Unit		45	50	65
D.	Water Requirement	-	-	Nil	Nil	Nil
E.	Capital Cost					
E-1	Civil (Rs. 000's)	-	-	90	160	315
E-2	Electro Mechanical (Rs. 000's)	-	-	270	370	470
F	**O&M Cost Per month**					
F-1	Power (assume @ Rs 3.5 per unit)	Rs	-	4800	5400	7000
F-2	Manpower (one local person as Caretaker)	Rs	-	4000	4000	4000
F-3	Maintenance spares (monthly average)	Rs	-	500	500	600

Estimates life of the RCC structures = 40-50 years

Estimated life of E&M equipment = 15-20 years of property maintained

Appendix O

I. GUIDELINES FOR SUPERVISING THE CONSTRUCTION

1) Water supply, sanitary and electricity fixtures and other materials used should be of the quality specified in the design or of relevant standard specifications.

2) Prescribed specifications and drawings should be adhered to. The work should be neat and workmanship should be good.

3) If the work done departmentally or through labour contract, quantities of various materials used should be as per the specified requirements.

4) Cement should be used in specified proportion in the concrete, brick work and plaster.

5) RCC work has been provided with specified reinforcements. Pinning is to be carried out in such a manner that there are no voids.

6) Flooring and the dado have been laid as per the specifications, rubbed and polished well.

7) Flooring should have a slight slope towards the squatting pan in the case of latrine cubicle. In the case of other areas the slope should be towards the drainage points.

8) Curing of all cement works should be done as per the specifications.

9) Door frames for hanging the doors should be fixed firmly and the doors should be provided with bolting arrangement, inside and outside. .

10) Tube well should be bored upto the required depth.

11) Water reservoirs should be water tight.

12) There should not be leakage in the water pipe lines and drainage pipes.

13) i) Squatting pans and traps installed should be of designs specified for a pour flush toilet and these should be fixed properly so as to provide 20 mm water-seal.
ii) In case the community toilet block is connected to the city sewer, master trap should be provided before the connection of the sewer.

14) Foot-rests should be fixed at the proper place and at an angle to make them slightly away from the squatting pan in the front.

15) Invert of the outlet pipe in the septic tank should be 50 mm below the invert of the inlet pipe.

16) Ventilating pipes of at least 100 mm diameter should be provided in each septic tank.

17) For commissioning, the septic tank should be filled with water upto outlet level and seeded with a small quantity of sludge from some other septic tank in operation or digested cow dung.

18) If the community toilet block has been provided with septic tanks, only the toilets and urinals connected to the tank. Other wastewater should be disposed of separately.

19) Proper gradient should be provided in sewers and the drains. Inside surface of the drains should be made smooth.

20) Manholes and drains for carrying sewage should be well covered to prevent emission of foul odour.

21) Adequate electric light points should be provided inside and outside the community toilet.

22) All surplus materials should be removed and the site cleared and dressed.

II. GUIDELINES FOR LOOKING AFTER OPERATION AND MAINTENANCE BY SUPERVISOR

Name of Community Toilet Block _____

Name of the Supervisor _____

Date of visit _____

Time of visit _____

Daily Check Points	Yes	No
Is everyone on duty at the time of the visit?	☐	☐
Have the instructions given earlier been complied with?	☐	☐
Have the deficiencies noticed in the earliest visit been removed?		
Are the latrine seats, urinals, wash hand basins, tiles, mosaic dado, floors, etc. clean?	☐	☐
Are they not becoming yellow or getting coated?	☐	☐
Have all the doors proper bolting arrangement?	☐	☐
Do the building and doors/windows etc. need any repairs?	☐	☐
Is there adequate quantity of water available during all the 24 hours?	☐	☐
Does the pumping plant functioning properly?	☐	☐
Is there any leakage of water or seepage at any place?	☐	☐
Is there any chokage or obstruction in the flow of excreta or waste water?	☐	☐
Are the septic tanks or soakage pits were over flowing?	☐	☐
Are all light points in working order?	☐	☐
Do the electric wiring, boards, switches, etc. need any repairs?	☐	☐
Have soap powder and cleaning materials available at the community toilet block?	☐	☐
Has soap powder being given to users for washing their hands?	☐	☐
Is the community toilet block clean (both inside and outside)?	☐	☐

Are there any cob-webs in the community toilet block?	☐	☐
Are there any scribbling on the walls, doors. etc.?	☐	☐
Is there any foul smell at any place?	☐	☐
Has the plantation done in the premises of the community toilet block being looked after well?	☐	☐
Has the box with locking arrangement for collecting the user charges been available and placed at the appropriate place?	☐	☐
Is ,the daily income from user-charges was as per target?	☐	☐
If not, give reasons for shortfall?	_____	
Have the complaint and suggestion book and complaint box been available at the community toilet block?	☐	☐
Have the complaints and suggestions recorded in them been attended to?	☐	☐

Monthly Check Points

1.	Does the community toilet block need white/colour washing and painting?	☐	☐
2a.	Have the sign boards and boards displaying use-instructions been fixed at the appropriate places properly?	☐	☐
2b.	Do they need re-painting	☐	☐

III. GUIDELINES FOR USERS OF THE COMMUNITY TOILET

1. Stand in queue if other users are waiting

2. Ask the attendant to clean the toilet before use, if it is not clean.

3. Sit in such a position for defecation, that the human waste falls, as far as possible inside the squatting pan and does not foul the sides.

4. Fill the mug provided in the latrine with water for ablution and flushing.

5. Before use, pour a little quantity of water to wet the pan so that excreta slide smoothly into the pit.

6. Use water or toilet paper for anal cleansing. Do not use any other material like stone, mud, thick paper, grass etc. for anal cleansing.

7. Pour water from the mug to flush the excreta after use.

8. Wash hands, using soap powder after defecation at the assigned place.

9. Do not throw lighted cigarette butts in the pan.

10. Take bath quickly, if others are waiting.

11. Do not wash clothes in the bathroom. Use the washing area.

12. Do not make any scribbling on the walls or doors of latrine.

13. If you have any complaints or suggestions, enter them in the complaint register available with the caretaker or drop them in the complaint box.

IV. GUIDELINES FOR LOCAL BODY TO CHECK OPERATION & MAINTENANCE

1. Is the toilet block being operated and maintained well? Have water and electricity been available?

2. Are users satisfied with the service?

3. (i) Are all the intended users availing the facility? If they are not, which section of the community is not using and why?

   (ii) Do health and sanitation education Programmes need to be stepped up to motivate those who are not using the facility?

   (iii) If 'per person per use' payment system is a deterrent, are the users willing to pay on a monthly basis for the facility?

   (iv) Any suggestions for use of the facility by all the targeted users?

4. If the toilet block is not functioning due to any reason like chokage of sewer, non--availability of water supply etc., have the deficiencies been removed expeditiously?

5. (i) Is round the clock attendant service (where applicable) ensured?
   (ii) Is the staff posted adequate?

6. Has the complaint book been available at the toilet block? Are there any complaints about the operation and maintenance of the toilet block and whether these are being attended to quickly?

7. Are there any problems or constraints? Are there any suggestions to resolve them or for improving the functioning of community toilet block?

Appendix P

Feasibility Matrix

Feasibility Factor	Maximum Feasibility Evaluation Score (FES)	Check List	Various Scenarios	Proposed Action
Availability of Land	5	✓ Ownership of the space or area identified ✓ Land free from all encumbrances ✓ Adequacy-of-area criterion – adequacy of space for the construction of a community toilet complex (CTC) comprising the number of toilet seats determined on the basis of demand-and-need analysis ✓ Farthest-distance criterion – the distance between the farthest dwelling unit in the area covered by proposed CTC does not exceed 500 metres	▪ Land belongs to the project implementation agency (PIA); ▪ Land is free from all encumbrances ▪ The two criteria of adequacy-of-area, and farthest-distance are satisfied	▪ Allot 5 points to the FES ▪ Proceed to evaluate the next feasibility factor
			▪ Land belongs to the project implementation agency (PIA); ▪ Land is not free from all encumbrances ▪ Under a legal dispute ▪ Occupied by illegal squatters ▪ Partially or fully occupied by dwelling units ▪ The two criteria of adequacy-of-area, and farthest-distance are satisfied	▪ If land under legal dispute, then identify alternative space, and/or evaluate the feasibility of individual household latrines (IHLs); allot 0 points to the FES ▪ If land occupied by illegal squatters, then clear land under the existing legal/institutional framework; allot 2.5 points to the FES; proceed to evaluate the next feasibility factor ▪ If land is partially or wholly occupied by dwelling units, then initiate processes under the existing legal/institutional framework to prepare rehabilitation and resettlement (R&R) plan, calculate the costs involved and estimate the time frame; allot 1.5 points to the FES; proceed to evaluate the next feasibility factor keeping in mind that the proposed project can only be initiated after taking possession of the land after completion of the R&R processes
			▪ Land is owned by a central/ state government department/agency other than the PIA (e.g. Railways) ▪ Land is free from all encumbrances ▪ The two criteria of adequacy-of-area, and farthest-distance are satisfied	▪ Obtain no-objection certificate (NOC) from the concerned department/agency ▪ Allot 4 points to the FES ▪ Proceed to evaluate the next feasibility factor

Feasibility Factor	Maximum Feasibility Evaluation Score (FES)	Check List	Various Scenarios	Proposed Action
			▪ Land is owned by a central/ state government department/agency other than the project implementation agency (e.g. Railways) ▪ Land is not free from all encumbrances ▪ Under a legal dispute ▪ Occupied by illegal squatters ▪ Partially or fully occupied by dwelling units ▪ The two criteria of adequacy-of-area, and farthest-distance are satisfied	▪ Obtain no-objection certificate (NOC) from the concerned department/agency ▪ If land under legal dispute, then identify alternative space, and/or evaluate the feasibility of individual household latrines (IHLs); allot 0 points to the FES ▪ If land occupied by illegal squatters, then clear land under the existing legal/institutional framework; allot 2 points to the FES; proceed to evaluate the next feasibility factor ▪ If land is partially or wholly occupied by dwelling units, then initiate processes under the existing legal/institutional framework to prepare rehabilitation and resettlement (R&R) plan, calculate the costs involved and estimate the time frame; allot 1 points to the FES; proceed to evaluate the next feasibility factor keeping in mind that the proposed project can only be initiated after taking possession of the land after completion of the R&R processes
			▪ Land is owned by a private person/ institution/ organization ▪ Land is free from all encumbrances ▪ The two criteria of adequacy-of-area, and farthest-distance are satisfied	▪ Initiate dialogue with the owner and check official records to ensure that for the land under consideration ▪ is not embroiled in any legal dispute ▪ the ownership title is as claimed ▪ Prepare the time schedule for and estimate costs of land acquisition and initiate processes to acquire the land under the existing legal and institutional framework ▪ Allot 2.5 points to the FES ▪ Proceed to evaluate the next feasibility factor
			▪ Land is owned by a private person/ institution/ organization ▪ Land is not free from all encumbrances ▪ Under a legal dispute ▪ Occupied by illegal squatters ▪ Partially or fully occupied by dwelling units ▪ The two criteria of adequacy-of-area, and farthest-distance are satisfied	▪ Location to be considered un-feasible ▪ Proceed to identify alternative location; evaluate the feasibility of providing IHLs
Sewage (waste-water) disposal	5	✓ Location of the closest point on the existing sewerage system ✓ Location of the closest point on the existing open storm	▪ The cost of construction of an on-site waste-water disposal system is lower/higher than the cost of laying a sewer line to the closest point on the existing sewerage or open storm water drainage system	▪ Evaluate the feasibility of connecting to the closest point on the existing open storm water drainage system

Feasibility Factor	Maximum Feasibility Evaluation Score (FES)	Check List	Various Scenarios	Proposed Action
		existing open storm water drainage system ✓ Soil conditions and ground water status	▪ The cost of construction of an on-site waste-water disposal system is higher than the cost of laying a sewer line to the closest point on the existing sewerage or open storm water drainage system ▪ The cost of connecting to the open drain is lower than that connecting to the sewerage system ▪ The distance between the point of connection to the drain and the point at which the drain is being intercepted to connect to the city's waste-water collection system that conveys waste water to the city's sewage treatment plant(s) is less than 20 metres	▪ Choose the option of connecting the waste-water disposal system of the CTC to the open drain ▪ Allot 4 points to the FES ▪ Proceed to evaluate the next feasibility factor
			▪ The cost of construction of an on-site waste-water disposal system is higher than the cost of laying a sewer line to the closest point on the existing underground sewerage or open storm water drainage system ▪ The cost of connecting the waste-water disposal system of the CTC to the nearest point on the existing underground sewerage system is lower than the cost of connecting to the existing open storm water system	▪ Choose the option of connecting the waste-water disposal system of the CTC to the existing underground sewerage system ▪ Allot 5 points to the FES ▪ Proceed to evaluate the next feasibility factor
			▪ The cost of construction of an on-site waste-water disposal system is higher than the cost of laying a sewer line to the closest point on the existing underground sewerage or open storm water drainage system ▪ The cost of connecting the waste-water disposal system of the CTC to the nearest point on the existing underground sewerage system is higher than the cost of connecting to the existing open storm water system ▪ The distance between the point of connection to the drain and the point at which the drain is being intercepted to connect to the city's waste-water collection system that conveys waste water to the city's sewage treatment plant(s) is more than 20 metres	▪ Choose the option of connecting the waste-water disposal system of the CTC to the existing underground sewerage system ▪ Allot 5 points to the FES ▪ Proceed to evaluate the next feasibility factor
			▪ The cost of construction of an on-site waste-water disposal system is lower than the cost of laying a sewer line to the closest point on the existing underground sewerage or open storm water drainage system	▪ Evaluate the feasibility of setting-up an on-site waste-water treatment and disposal system considering the existing soil and ground water conditions

Feasibility Factor	Maximum Feasibility Evaluation Score (FES)	Check List	Various Scenarios	Proposed Action
			▪ Existing soil and ground water conditions considered suitable for setting-up an on-site waste-water treatment and disposal system comprising a septic tank and a soak pit	▪ Choose the option of on-site waste-water treatment and disposal system comprising a septic tank and a soak pit ▪ Allot 3 points to the FES ▪ Proceed to evaluate the next feasibility factor
			▪ Existing soil and ground water conditions are not considered suitable for setting-up an on-site waste-water treatment and disposal system comprising a septic tank and a soak pit	▪ Choose the option of on-site waste-water treatment and disposal system comprising a mini sewage treatment plant (STP) ▪ Allot 2 points to the FES ▪ Proceed to evaluate the next feasibility factor
Water and Electricity Supply	5, 5	✓ Availability of water either through piped supply or through bore-well ✓ Availability of electricity through normal city supply or diesel generator set	▪ Piped water supply is available, and is adequate	▪ Allot 5 points to the FES
			▪ Piped water supply is available, but not adequate	▪ Provide for bore-well and pumping arrangements to supplement piped water supply ▪ Allot 4 points to the FES
			▪ No piped water supply is available	▪ Provide for bore-well and pumping arrangements ▪ Allot 3 points to the FES
			▪ No water supply is available	▪ Location to be considered un-feasible ▪ Proceed to identify alternative location;
			▪ Adequate electricity supply is available	▪ Allot 5 points to the FES
			▪ Electricity supply is available, but inadequate	▪ Provide for diesel generator back-up ▪ Allot 3 points to the FES
			▪ No electricity supply available	▪ Provide for diesel generator ▪ Alternatively, evaluate the feasibility of providing dual-fuel generator (this will be dependent on the number of toilet seats in the proposed CTC) ▪ Also, evaluate the feasibility of setting up a solar energy based electricity supply system ▪ Allot 2 points to the FES

Appendix Q

Appendix Q : Break-up of Costs for Civil Works of Main CTC Building

Item	(Amount in INR)		
	5-WC	10-WC	20-WC
Excavation	1,800	3,000	6,000
Plain cement concrete below foundations, floors etc. (M10)	5,200	8,500	17,000
Brickwork (230/115 mm at foundation level and in superstructure	55,000	90,000	165,250
Reinforced Cement Concrete works for variuos elements (M20)	30,000	50,000	90,000
Reinforcement and other steelworks	57,000	95,000	160,000
Plastering	12,760	22,000	38,500
Floor and Dado Finishing using ceramic tiles/"Kota" stone	35,000	60,000	110,000
Doors and Windows	1,800	2,750	5,500
Sanitary works including fittings, fixtures, drains, pipes, chambers etc.	57,000	94,000	175,000
Painting	7,000	12,000	20,000
Sub-total	262,560	437,250	787,250
Miscellaneous works and contingencies (10%)	26,256	43,725	78,725
TOTAL COST FOR CIVIL WORKS (MAIN CTC BUILDING)	**288,816**	**480,975**	**865,975**
Rounded off	**289,000**	**481,000**	**866,000**

Appendix R

FEASIBILITY STUDY CTC – LAND IDENTIFICATION SURVEY FOR NON SEWERAGE SCHEME IN ALLAHABAD CITY.

A: Name of the Slum: _____
B: Address: _____
_____

C: Approximate Population: _____
D: Any CTC present in the area: Yes No If Present then what capacity 5 Seater 10seater 20 seater
Is there a requirement for new CTC?
Yes No
E: If yes the location for the required CTC: (*Mark the nearest landmark for identification by which it can be reached in future)*)

Option 1._____
Option 2._____

F: Current Status of the Land (Need 250 Sq Mtr in case of 10 seats).
Ownership of the said land.
NN: ADA: Other: Private:
Current land use._____
Is it marked for some other purpose? _____
Available land area (in sq. m) _____

G: Current Source of Water Supply in the slum._____
If by Pipeline then What time to what time_____
H: Is the slum electrified. Yes: No:
From what time to what time._____

I: Wastewater Disposal: 1.Sewer Line 2.Open Drain

SITE MAP
(Use Back of this Page if Need more Space)

Appendix S

Appendix S Results of Rapid Survey for Land Availability (Allahabad)

S. No.	Name of the slum	Population	Any CTC present in the area	Require-ment of New CTC	Proposed Location of CTC	Availability of Land		Utility		
						Land Owner	Current Land Use	Water Supply	Electricity Supply	Waste Water Disposal
1	Ambedkar Nagar	4000	No	Yes	1. Kharkoni Market Xing -Gram Sabha chabutara 2. Handpipe, Shobha Polyclinic, Kallu Ram Bartia	NN	Handpipe, Chabotra	Handpipe	Yes	Open Drain
2	Bhim Nagar	3200	Yes (10 seater)	No		NN		Pipeline	Yes	Open Drain
3	Chak Bhatei	2400	No	Yes	Community Centre	NN	Community centre by DUDA	Pipeline	Yes	Open Drain
4	Chakadaud Nagar	2500	Yes (12 seater)	No	Same CTC as inplace of old existing CTC	NN	CTC existing	Pipeline	Yes	Open Drain
5	Chakia daakkhana				Not available					
6	Chand pur				Not available					
7	Chauphatka				Not available					
8	Dakshin Lokapuri	4500	No	Yes	Village Pond	NN	Pond open (getting dischrge of all the village)	Pipeline & Handpump	Yes	Open Drain
9	Gaderian Pur				Not available					
10	Jai Ram Pur	1000	No	Yes	Village Pond (can be approached three villager's)	NN	Pond & getting wastewater from village	Handpipe	No	Open Drain

11	Jodhwal		No	No	No land can be located for the CTC as villager's/community is not willing to help in locate the same			Pipeline	Yes	Sewerline Open Drain
12	Kaaji Pur	4000	No	Yes	Near Sharda Prasad House	NN	Free & Open	Pipeline & Handpump	Yes	Sewerline Open Drain
13	Kailash puri				Not available					
14	Kalindi				Not available					
15	Kasari Masari	250-300	No	Yes	Open Land (A.D.A)	ADA	Open	Pipeline	Yes	Sewerline
16	Mulai Ka Pura				Not available					
17	Naini village	7000	No	Yes	On main COD Road near school compound Inside Panchayat Bhawan	Gram Samaj	School Ground	Handpipe	Yes	Open Drain
18	Phaphamau	2700-3000	No	Yes	Village land to be provided by community aflu	Other	Open	Handpipe & Supply by Tank	Yes	
19	Pura Fateh Mohammad Talab	3000	No	Yes	Behind the Hand Pump/Water supply boring	NN		Pipeline	Yes	Open Drain
20	Rajroop Pur				Not available					
21	Ram Pur Patpar				Not available					
22	Salori				Not available					
23	Swaraj nagar				Not available					
24	Telia Ganj				Not available					
25	Yamuna Bank Road				Not available					
26	Jai Ram Pur Patpar	3000	No	Yes	Near Samudayak Centre	NN	Open	No	Yes	Open Drain