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IMPORTANT INFORMATION / Definitions

Domestic Sewage: Wastewater generated as a result of household human activities – bathing, cloth washing, excreta flushing, etc.

Interceptor Tank: Interceptor tank is similar to septic tank but has a single chamber and lesser hydraulic retention time (hence smaller size). These are built on-plot as part of small bore/ settled sewerage system. These serve two purposes- 1) retain most of the solids; and 2) dampen peak flows, thus the design of downstream sewerage network can be relaxed.

Slum Area in Uttarakhand: मलिन बस्ती का तात्पर्य नगर निकाय की परिधि / सीमाओं के अर्न्तगत एक ऐसी अनियोजित व उच्च धनत्व वाली स्वच्छता रहित बसावत से है , जिसमे पर्वतीय क्षेत्रो में 5 अथवा 5 से अधिक परिवारो के समूह अथवा मैदानी क्षेत्रो में 20 से अधिक परिवारों के समूह निवास करते हों तथा जहॉ न्यूनातिन्यून 50 प्रतिशत अर्ध–स्थायी संरचनाओ युक्त 25 वर्ग , भूमि पर अवैध अधिकार तथा आधारभूत सुविधाओ के बिना निवास करते हो अथवा भूमि के वैध अधिकार के साथ किन्तु आधारभूत सुविधाओं के बिना निवास कर रहें हों ।

स्लम एरिया की परिभाषा

''स्लम एरिया '' से अभिप्रायः ऐसी बस्ती से है , जो नगर निगम / नगर पालिका परिषद / नगर पंचायत / विकास प्राधिकरण के क्षेत्र में राजकीय अथवा स्थानीय निकायों / विभागो की भूमि पर अनियोजित , अनियमित एवं अनाधिकृत रूप से बसी हुयी है , जिसमे कच्चे / पक्के अथवा आंशिक कच्चे / पक्के मकान निर्मित हैं और मौलिक सुविधाओ का अभाव है तथा जिसमे अधिकांशत 'गरीबी की रेखा' से नीचे के व्यक्ति निवास करते है तथा व्यक्तिगत भूखण्डो का औसत आकार 30 वर्ग मीटर से अधिक नही है (सक्षम प्राधिकारी / जिलाधिकारी इसमे 10 प्रतिशत तक छूट दे सकता है)।

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Septage: Septage is the liquid and solid material pumped from a septic tank or on-site sanitation facility.

Sewer: A pipe or conduit that carries wastewater or drainage water.

Sewerage: A complete system of piping, pumps, basins, tanks, unit processes and infrastructure for the collection and transport of wastewater.

Sewage Return Factor: A constant denoting the proportion of household water supply returning as wastewater after use. For example sewage return factor of 0.80 indicates that 80 percent of water supplied returns as sewage.

Definitions of Household Sanitation Arrangements according to Census 2001

Water closet latrine (WC): The sanitary water flush latrines are those latrines that have water closets fitted with flushing cistern. Such latrines that may be connected to a septic tank or an underground sewerage system will also be recorded as water closet latrines. The faecal matter from these types of latrines is removed without the need for scavenging or manual handling of excreta.

Pit latrine: The latrines attached to the pit that is dug into the ground for the reception of night soil are reckoned as pit latrines.

Other latrine: This category includes service latrines (i.e. those that are cleaned manually); latrines serviced by animals such as pigs, etc. and all latrines other than the pit and the water closet types of latrine

Note: the definitions adopted for baseline sanitation survey follow the above definitions.

Abbreviations

CSP	**City Sanitation Plan**
CBO	**Community Based Organization**
CPHEEO	**Central Public Health and Environmental Engineering Organization**
GoI	**Government of India**
EO	**Executive Officer**
NP	**Nagar Panchayat**
DNP	**DoiwalaNagar Panchayat**
NPP	**Nagar Palika Parishad**
SUDA	**State Urban Development Authority**
GoU	**Government of Uttarakhand**
HHs	**Households**
ILCS	**Integrated Low Cost Sanitation Scheme**
IUSP	**Integrated Urban Sanitation Programme**
LPCD	**Litres per Capita per Day**
MLD	**Million Litres per Day**
MoUD	**Ministry of Urban Development**
M&E	**Monitoring and Evaluation**
NGO	**Non-Governmental Organisation**
NUSP	**National Urban Sanitation Policy**
O&M	**Operation and Maintenance**
RWA	**Residence Welfare Association**
STP	**Sewage Treatment Plant**
ULB	**Urban Local Body**
USPCB	**Uttarakhand State Pollution Control Board**
WC	**Water Closet**

CHAPTER 1: OVERVIEW

The Urban Sanitation Strategy in India envisages that all Indian cities and towns become totally sanitized, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.

The goals of the National Urban Sanitation Policy are as follows:

Generating awareness about sanitation and its linkages with public and environmental health amongst communities and institutions.

Promoting mechanisms to bring about and sustain behavioural changes aimed at adoption of healthy sanitation practices.

Awareness generation and behaviour change in the field of Sanitation.

Open defecation free cities.

Integrated cities wide sanitation.

Improved public health outcomes and environmental standard.

Solid waste collection and its safe disposal

No adverse impacts of city wastes on surrounding areas

In the light of above objectives and goals of National Urban sanitation Policy city Sanitation Plan has been prepared for the town Doiwala of the State of Uttarakhand

1.1 Introduction

Doiwalais a fast developing town of the state of Uttarakhand along Haridwar – Dehradun. It is a proposed magnet mega city. City is growing as a transition town and works as central market for the nearby villages. It is a small town area surrounded by many small villages as Bhaniyawala, Jolly Grant, Laltappar, Chiddarwala, Teliwala, Hansuwala etc. Baseline survey, situational analysis of sanitation, consultations and discussions with stakeholders and detailed analysis of technical options reveals the following details-

City level strategic technical options for sanitation that are economically and the geographically feasible

A brief analysis of institutional and legal issues

A communication strategy has also been prepared for consideration of training and other capacity building, awareness generation, consultative and mobilisation actions to achieve the foresaid objectives of the City Sanitation in the town.

1.2 Brief City Profile

1.2.1 Historical Background

Doiwala town is a small but an important town it has an area of 2.91 sq. kms having a population of 8,047 as per 2001 census the current population of the city has been estimated about 10,302 with the annual growth rate of 2.5% . The city was declared an Urban Local Body (ULB) on 04 Feb 1984. The city ULB is known as Nagar Panchayat (class IV city) as it falls in the category of cities having population limit of 20,000. People from various religion and belief living in the great harmony and thus presenting an excellent example of national integration in the town. There are seven municipal wards in the city that are divided in to two clusters for the sanitary functions.

1.2.2 Economic Profile of the City

The city Doiwalais a Nagar Panchayat (NP, hereinafter). It is a small town area surrounded by many small villages therefore having an agro-based economy. It is an important agriculture trade centre for the nearby area. City is growing as a transition town and works as central market for the nearby villages. The main economy of the town is agriculture and mining. The place has a constant floating population. One sahakari sugar mill is functional in the town having its own residential colony of about 800 to 1000 workers few of them are daily commuters of nearby villages. The main occupation of the inhabitants in this area is agriculture. Main crops of the area are sugarcane and good quality of rice. Commercial establishments have also come up and further growth is taking place in the town. In these circumstances, rapid growth and fast development of Doiwala is anticipated.

Picture: 1.1 showing sugar mill functioning in the town Doiwala

City is also close to two important tourist and religious attractions of the State namely Haridwar and Rishikesh through which the holy river Ganga is passing. Both the places have worldwide attraction of tourists and pilgrims throughout the year. Road connecting to the airport to state capital crosses the town Doiwala. The only accordance of Uttarakhand and well known Medical College in Jollygrant is situated within 5 Kms of this town. The only airport of the region, Jolly grant air port is about 6 km away from the main city therefore with the future expansion of the capital city and the two nearby religious places; city will definitely play an important role to increase the tourist economy of the region.

1.2.3 City Demographic Profile

The population of the city Doiwala was 8,047 as per the census 2001. At present the estimated population is 10302 at the rate of 2.5% growth rate per year. Number of the households in the city is about 2000 on the basis of a family size of about 5 person per family .The city is having a constant floating population of about 1000-1500 people per day. The NP is looking after all the city sanitation activities.

As far as the city population growth trend concerns the city population was 7473 in the year 1991 while it has grown to about 8047 in the year 2001 (Ward wise Area, Population and Household details has been given in the table -1)

Table -1.1 showing Population growth trends (1991-2011)

Table: Population Growth (1991-2011)			
S. No.	**Year**	**Population**	**Decadal growth rate**
1	1991	7473	About 2.5%
2	2001	8047	About 2.5%
3	2010-11(estimated)	10302	About 2.5%

Source: Doiwala Nagar Panchayat

Table - 1.2 Showing Ward wise population statistics- 2001

Ward wise Population and households					
Ward No	**Name**	**Area (Hectare)**	**Census 2001 Population**	**estimated population(2011) decadal growth rate 2.5%**	**Households (2001)**
1	Amedkar Nagar	34	1176	1505	233
2	Thana	39	1068	1367	232
3	Trigharat	44	1218	1560	344
4	Mil Area	46	1188	1520	147
5	Ravidas Mandir	40	988	1265	199
6	Gyan Vihar	41	1261	1615	176
7	Prem Nagar	47	1148	1470	253
	Total	**291**	**8047**	**10302**	**1584**
Source : census :2001 & calculation based estimated figures					

Town has about 1500 per day floating population this add to the existing population to reach at about 11,850.

Table 1.3 showing estimated population for 2011 and 2014

year	**Assumed decadal growth rate (%)**	**Projected population('000)**	**Projected commuters/floating population**	**Estimated Total population**
2011	2.5%	10302	1545	11850
2014	2.5%	11370	1705	13075

Source: Doiwala Nagar Panchayat

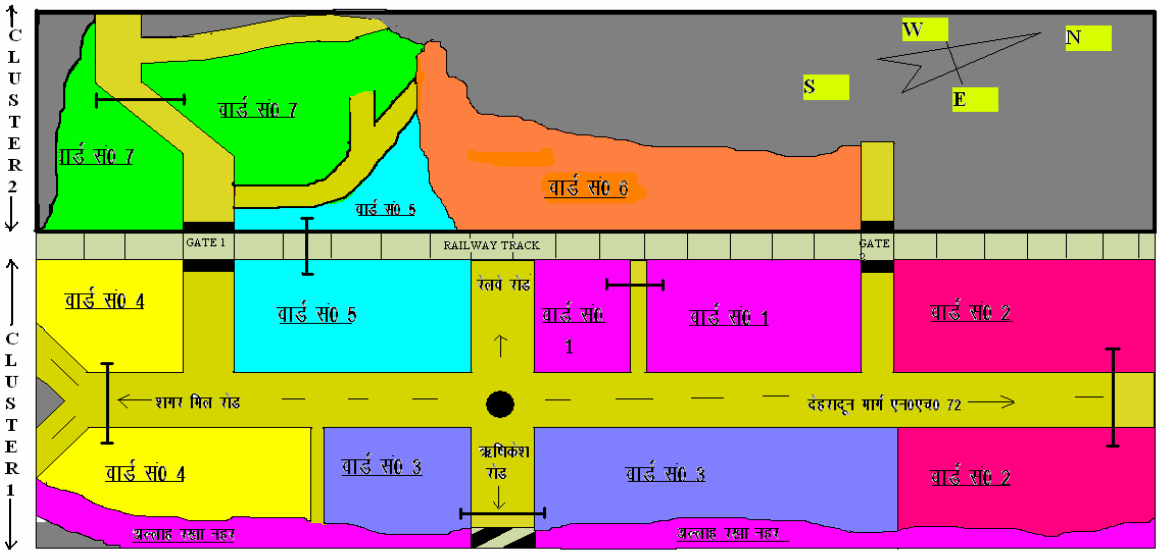
About 15 % equivalent population is considered for floating population

1.2.4 Linkages and Connectivity

Doiwala is one of the way side and important Railway Station of the Northern Railway on the main Railway line from Haridwar to Dehradun in Uttarakhand State. Doiwala town (Nagar Panchayat) is situated in Bhawar region of District Dehradun at a distance of 22 Kms from Dehradun on national highway No. 72 and is connected with State Capital Dehradun, Rishikesh and Haridwar well known pilgrim centres , Delhi the National Capital by road. Town is also having its own railway station, “Doiwala” on main Howrah Dehradun rail track of Northern Railway well connected with Dehradun, Haridwar , Delhi and Howrah railway stations. Dehradun Airport known as Jolly Grant is only 6 km away from Doiwala which gives importance to the city.

Picture: 1.2 showing railway station of the town Doiwala

The holy city; Rishikesh and Haridwar are located at about 22 km and about 40 km away from the town through which holy river Ganga is passing through. The town has one local bus stand and one small railway station.



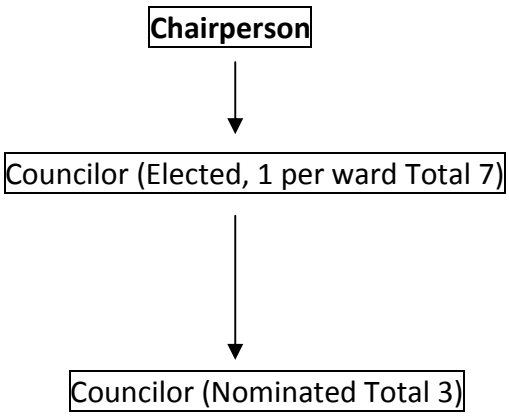
Picture: 1.3 showing Map of Doiwalain two clusters of the city

1.2.5- Political and Administrative Set-up

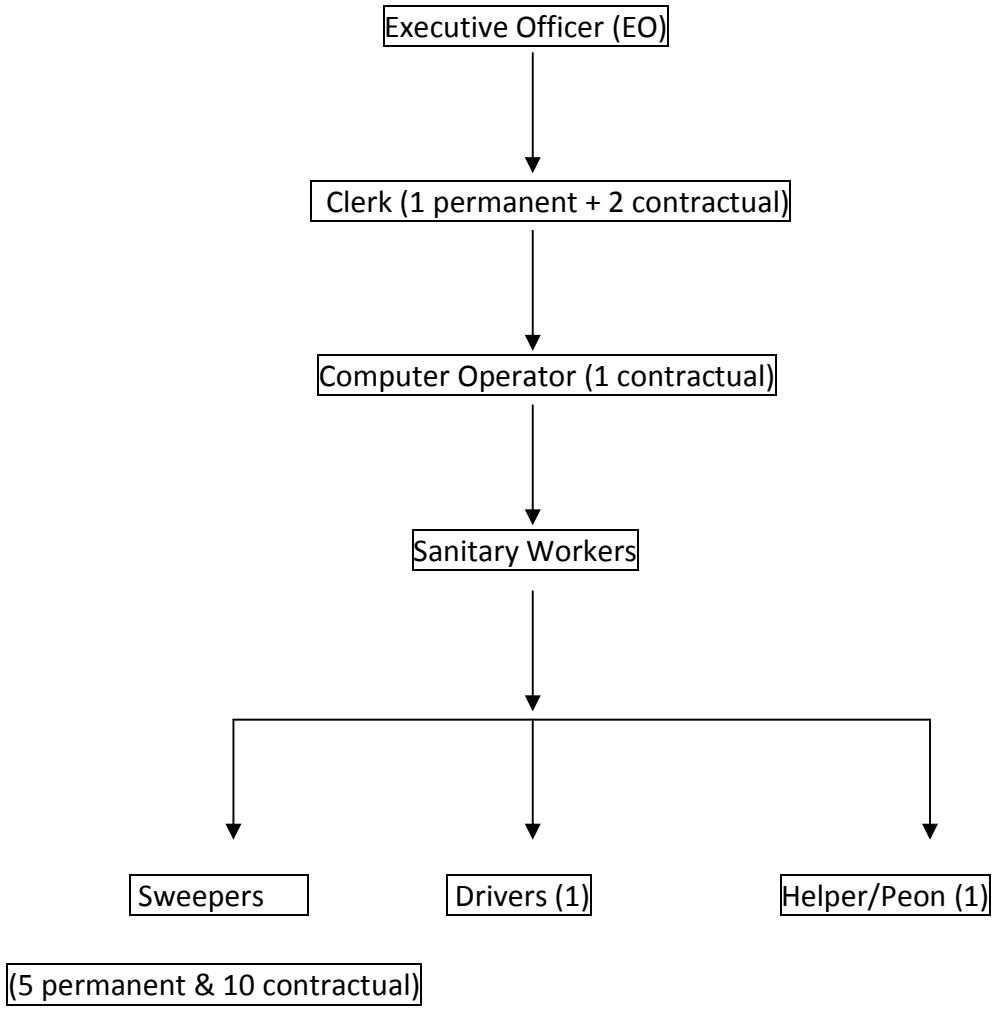
Doiwala is classified as class IV town and has a Nagar Panchayat. The DNP was established in 1984. The DNP has 7 wards and 7 elected members, led by a chairperson that is directly elected by the people. The administrative functions are led by Executive officer (EO). As DNP is a class IV town; i.e. town having population less than 20,000 therefore the number of official are also very less. The EO is supported by staff members including health, revenue and accounts. There are 25 employees under DNP. The NP is responsible for provisions of services as sanitation, street-lighting, maintenance of roads, parks, and recreational facilities. The main duties under DNP include sanitation, SWM, health, repair and construction of roads, construction and maintenance of surface drains, street lightings etc. Main sources of revenue generation for DNP are house tax, licence fees. Governance structure of NP Doiwala is divided in to two wings i.e. elected wing and administrative wing.

In the elected wing there is an elected ward member (councillor, locally called parshad) from each ward and three nominated councillors all the councillors are headed by chairperson. The chairperson; who is directly elected by the people is the chairperson (Adhyaksha) of the NP. The Nagar Panchayat Administration is headed by the Executive Officer (EO) who is assisted by the subordinate staff. The hierarchical structure of Governance set up has been shown in the figure below.

Elected Wing



Administrative Wing



1.2.6 Sanitation Scenario of the City

As per the secondary data collected from DNP, out of total 1584 households 1433 households (about 90%) have their own latrines with septic tank whereas the primary survey data analysis shows about 85% households having their water closet type latrines draining in to their own septic tanks /interceptor tanks/ have mixed i.e. single and twin pit latrine system in their houses. About 25 households are using public/community toilets and about 20 households are practicing open defecation in the city it calculates that about 2-3% households lack access to any household sanitation facilities in the town these are the families belonging to BPL category. There are no arrangements for safe disposal and cleaning of on-site installations. At 1 or 2 places cases of unsafe

disposal in to nallas were observed during the primary survey. There is no data available on issues of health and hygienic practice due to unsafe disposal and other sanitary lacuna in the city .As far as the public amenities concerns there is only one public toilet, one community toilet (having a load of about 125 persons per day in comparison to 60 person per seat per day as a standard). Therefore There is urgently requirement of constructing individual, public and community toilets. The public / community toilets facility is lacking in ward no. 1, 2, 5, 6 & 7. Safe disposal and cleaning arrangements for both the above types of on-site installations are not well-documented. DNP has lack of staff engaged in sanitation services (The town has 5 regular and 10 contract based sanitation employees); also there is lack of technical persons in the staff therefore DNP needs to strengthen institutional capacities to develop, to implement and to sustain the attained objectives of the city sanitation plan.

1.2.7 City Sanitation Planning Process in Doiwala

The city Doiwala, in the state Uttarakhand is becoming important due to its nearness from the capital city and the only airport of the region known as jolly grant which is situated 6 kms away from Doiwala. The fact that this airport is near to the state capital and is going for major expansion plans would bring Doiwala in to prominence. As city is connecting these two places due to its location it has become important to take initiatives on priority basis for city sanitation. The urban development directorate have been the supporting hand to DNP to develop the city sanitation plan for the city. For this The Urban local bodies conducted a base line city sanitation survey under the supportive directions provided from UDD (Urban Development Directorate, Dehradun) in the month of July & August 2010. Technical assistance was provided from the urban development directorate officials and experts to collect the information on current sanitation situation and Problems related to the issues mentioned in the NUSP 2008. The survey was based on 30% sampling of the households, covering all kinds of units as shops, other commercial units, houses, public & semi public institutions etc. to collect the update information from all the 7 wards of the city. The survey format was based on the 'National Urban Sanitation Policy' (NUSP) 2008 to cover the issues from all possible fields for total city sanitation. As Doiwala has not been covered under any other city level sanitation programme therefore ULBs is enthusiastically handling the city sanitation plan development and implementation.

The main works are related to street cleaning, solid waste management, and maintenance of public toilets. As the ULBs lack necessary technical capacity to understand and manage the technical issues under sanitation, there is a need to strengthen this capacity. There are a number of issues ranging from coverage, quality, infrastructure, awareness, institutional role clarity, financial aspects and human resources that are affecting the status of urban sanitation in the city. The city sanitation plan intends to address these issues.

Following a number of steps including Baseline Survey, Situational Analysis, consultations and discussions with stakeholders, and detailed analysis of technical options, this report includes Techno-economic analysis of Strategic City level Sanitation Technical Options; and a brief analysis of institutional and legal issues.

1.2.8 Need for the City Sanitation Plan

City is facing following problems in context of city sanitation therefore there is an urgent need to prepare city sanitation plan followed by its implementation for making city 100% clean .Lack of awareness is the major cause for solid waste and garbage collection problems in the city that has to be taken in notice on priority during the implementation and training stage. Improper management of solid waste can lead to health, environment, and avoidance by the tourist kind of problems in future therefore the city sanitation plan has been prepared on the guidelines given in the national urban sanitation policy 2008. Major problems of the city includes

- Solid waste accumulation in the neighbourhood localities
- Obstruction in flow of rain water due to improper dumping of domestic waste causing water logging problem in few of the wards
- Endangering lives of labourers and sweepers
- Waste destroying and chocking open roadside drains
- Garbage causing soil pollution and destroying plants leading to environment degradation
- Dumped garbage and Plastic waste harmful for the residents
- Disposal at convenience and on Road sides
- Forest at stake
- Improper waste disposal leading to landslides

The challenge before the city is to respond to the local situation by carrying out a series of IEC and awareness generation activities. In context of above background to achieve 100% sanitation task in the town it is imperative to prepare a city sanitation plan depending on the existing sanitation condition, future demand and need in local context. To give a proper shape to the city sanitation plan the guidelines of the NUSP has been followed under the supervision of ULB.

CHAPTER-2

2.1 National Urban Sanitation Policy (NUSP)

The Vision of the NUSP is:

All Indian cities and towns become totally sanitized, healthy and liveable; and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.

To transform Urban India into *community-driven, totally sanitized, healthy and livable cities and towns,* the policy sets out the following goals:

A AWARENESS GENERATION AND BEHAVIOUR CHANGE

B OPEN DEFECATION FREE CITIES

C INTEGRATED CITY-WIDE SANITATION

1. Re-orienting Institutions and Mainstreaming Sanitation

2. Sanitary and safe disposal: 100% of human excreta and liquid wastes must be disposed of safely

3. Proper Operations and maintenance (O&M) of all sanitary installations

The policy envisages the preparation of *State Sanitation Strategies* within the overall National Policy framework. In turn, cities are expected to prepare their city-wide sanitation plans that need to be prepared in a consultative and participatory manner, and using an incremental approach to addressing the issue of sanitation in a comprehensive city-wide manner.

Source: NUSP, 2008.

2.1.1 Strengthening Institutional Arrangements, Participation and Effective Communications

The existing institutional and administrative system shows the lack of technical capabilities and involvement of community furthermore the DNP does not have quantitatively and qualitatively sufficient work force to ensure sustainable delivery of better sanitation services in the town. The recruitment of skilled workforce is needed to be addressed urgently to manage the things appropriately.

As per the primary survey held in the town most of the people were not found willing to pay for the quality services if provided to them with the involvement of private party. Also there were lack of awareness about the impact of unhygienic environment and improper disposal of waste on health and environment. Therefore a workable strategy has been prepared for involvement of household ladies and other representatives from every nuke and corner of the society to change their mindsets and understanding their incentives to change behaviour and practices.

A strategy has been made to engage the community representative at lowest level to monitor the sanitation standard in their locality. This strategy will not only help in changing the mindset of the people but also will help in effective implementation of city sanitation plan. Various means has been outlined for generating awareness amongst urban households on sanitation and its linkages with health, economic productivity and the environment along the facilitating behaviour change towards adoption of safe sanitation practices among households.

As city is facing lot of problems in covering all the dimensions of city wide sanitation therefore locally suited technology options, enhancement of institutional capacities, involvement of skilled work force for better management and implementation and a functional communication strategy is urgently required in the town .

Following steps are recommended for efficient implementation of Doiwala city sanitation plan

- Discussion and presentation of the most suitable technical options for the city-wide sanitation
- Development and implementation of strategic action plan at ward level to ensure the better level of service provided
- Involvement of mohalla swachata samities for solid waste management

- Arrangement of training , workshops , capacity building programme and other IEC activities for NP staff members , councillors , sanitation department employees and task force members
- Various awareness generation means must be followed to aware the common people of the society about city wide sanitation
- Arrangement of open area discussion, meetings must be held with common people and their representatives at ward level.
- Identification of gaps in legislative rules and recommendation for its amendments
- Strengthen institutional set-up to ensure sustainable sanitation service delivery
- Design of M& E system
- Implementation of city sanitation plan

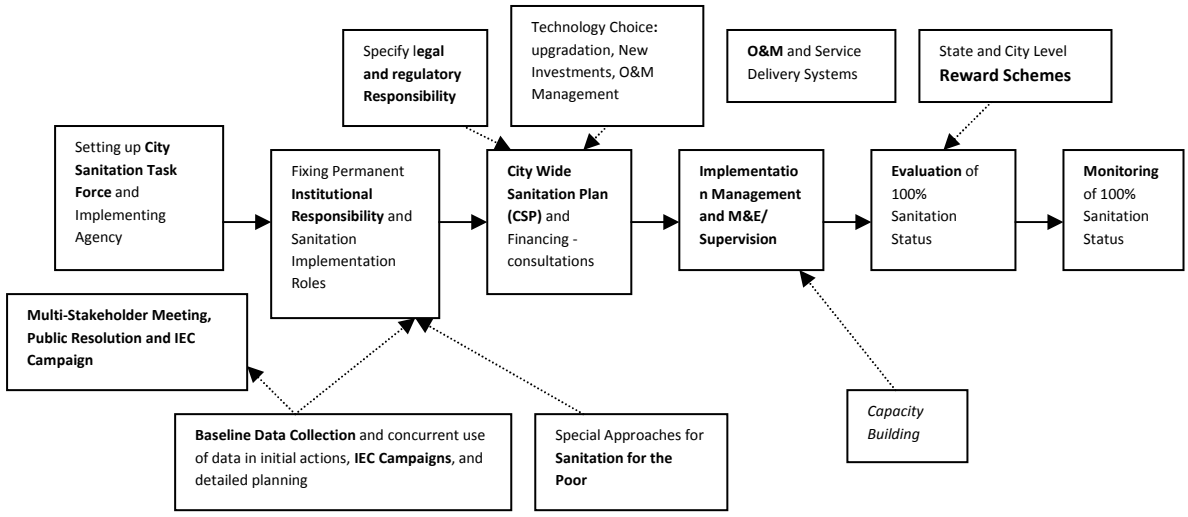
2.1.2 CITY-WIDE SANITATION: COMPONENTS AND TECHNOLOGY OPTIONS

This chapter briefly describes the NUSP vision and CSP framework. This is followed by a brief description of existing environmental sanitation situation of the town, proposed NRCP (sewerage and sewage treatment scheme) and potential choices for upgrading.

2.1.3 NUSP Vision and City-wide Sanitation Planning

The National Urban Sanitation Policy envisions – 'All Indian cities and towns become totally sanitised, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.

Fig (1): Generic Elements of Planning, Implementation and M&E of City Wide Sanitation



Source: NUSP, MoUD, GoI (2008)

As a starting point to achieving this vision, the policy provides a framework for city-wide sanitation. Generic elements of planning, implementation and M&E are presented in Figure. The purpose of the framework is to assist Urban Local Bodies, NGOs, community based organizations, citizens and private sector agencies in Govt. of India through a series of steps toward achieving the goal of 100 percent sanitation in the city.

The CSP framework emphasises that- though apparently linear, the process needs to be highly iterative and draw in inputs from one series of steps to another.

Preparation of city-wide sanitation plan is an important step in the process. The purpose of the step is to build various scenarios for technology options and choosing the most suited one. It is important to deliberate on pros and cons of each option before final selection.

The CSP framework outlines tasks that the States and ULBs will need to undertake: “States will need to determine time-frames and deadlines to achieve the goals mentioned in the National Urban Sanitation Policy and will need to spell out a detailed roadmap, including the incremental targets for achievement of goals. For example, to achieve the goal of open defecation free (ODF) by year 2011, a detailed plan for extending access will need to be formulated and implemented in a time-bound manner. All such steps will need to be spelt out and operationalized under the CSPs.

While some of the activities in the sanitation plan may be possible to complete with little financial resources e.g. better utilization of existing facilities, improved management systems for septage cleaning, awareness generation; etc. whereas others e.g. reconditioning or laying new sewers, may be more resource-intensive. The CSP will need to be prepared keeping in view what the city can afford and finance. It will be better as far as possible to improve the effectiveness of existing facilities before embarking on expensive new investments. Further, thinking about the whole city, and not just some portions or just some facilities, will be necessary to achieve the goals in a comprehensive and systematic manner."

2.2 Key Sanitation Policy Issues

After evaluation of NUSP following key issues have been identified:

2.2.1 Poor Awareness

Sanitation has been accorded low priority and there is poor awareness about its inherent linkages with public health.

2.2.2 Social and Occupational aspects of Sanitation

Despite the appropriate legal framework, progress towards the elimination of manual scavenging has shown limited success, little or no attention has been paid towards the occupational hazards faced by sanitation workers daily.

2.2.3 Fragmented Institutional Roles and Responsibilities

There are considerable gaps and overlaps in institutional roles and responsibilities at the city levels.

2.2.4 Lack of an Integrated City-wide Approach

Sanitation investments are currently planned in a piece-meal manner and do not take into account the full cycle of safe confinement, treatment and safe disposal of waste.

2.2.5 Limited Technology Choices

Technologies have been focused on limited options that have not been cost-effective and sustainability of investments has been in question.

2.2.6 Reaching the Un-served and Poor

Urban poor communities as well other residents of informal settlements have been constrained by lack of tenure, space or economic constraints in obtaining affordable access to safe sanitation. In relation to “Pay and Use” toilets, the issue of subsidies inadvertently reaching the non-poor should be addressed by identifying different categories of urban poor.

2.2.7 Lack of Demand Responsiveness

Sanitation has been provided by public agencies in a supply-driven manner, with little regard for demands and preferences of households as customers of sanitation services.

In order to address the above issues, there is a need to go for the city sanitation plan which will be based on the following issues:

- Institutional Roles and Responsibilities
- Awareness Generation for changing mindsets
- City-wide Approach
- Technology Choice
- Reaching the un-served and poor
- Client focus and Generation of Demand
- Sustained Improvements

2.3 Policy Goals

The overall goal of this urban sanitation policy is to transform Urban India into community driven, totally sanitized, healthy and liveable cities and towns

As per National Urban sanitation Policy the specific goals are:

2.3.1 Awareness Generation and Behaviour Change

Generating awareness about sanitation and its linkages with public and environmental health amongst communities and institutions;

Promoting mechanisms to bring about and sustain behavioural changes aimed at adoption of healthy sanitation practices

2.3.2 Open Defecation Free Cities: Achieving Open Defecation Free Cities

All urban dwellers will have access to and use safe and hygienic sanitation facilities and arrangements so that no one defecates in the open. In order to achieve this goal, the following activities will be undertaken:

Promoting access to households with safe sanitation facilities (including proper disposal arrangements);

Promoting community-planned and managed toilets wherever necessary, for groups of households who have constraints of space, tenure or economic constraints in gaining access to individual facilities;

Adequate availability and 100 % upkeep and management of Public Sanitation facilities in all urban areas to make the areas free from open waste, defecation and other environmental hazards

2.3.3 Integrated City-Wide Sanitation Re-Orienting Institutions and Mainstreaming Sanitation

Mainstream thinking, planning and implementing measures related to sanitation in all sectors and departmental domains as a cross-cutting issue, especially in all urban management endeavours; Strengthening city and local institutions (public, private and community) to accord priority to sanitation provision, including planning, implementation and O&M management; Extending access to proper sanitation facilities for poor communities and other un-served settlements

2.3.4 City Sanitation Strategic Technical Options

This report aims in achieving the goal of city wide total sanitation through available technical options. Based on various technical, financial, and other available infrastructure facilities in the town following city-wide sanitation technical options are suggested

1. Fully On-site Sanitation: Septic tanks or Twin Soak Pits

2. Fully off-site Sanitation: Settled (Small bore) sewerage

3. Part on-site (Septic tanks or Twin Soak Pits) / part off-site (Conventional Sewerage)

4. Simplified Sewerage with Decentralised Wastewater treatment

2.3.5 Sanitary and Safe Disposal

100 % of human excreta and liquid wastes from all sanitation facilities including toilets must be disposed of safely. In order to achieve this goal, the following activities shall be undertaken: Promoting proper functioning of network-based sewerage systems and

Ensuring connections of households to them wherever possible;

Promoting recycle and reuse of treated waste water for non potable applications wherever possible will be encouraged.

Promoting proper disposal and treatment of sludge from on-site installations (septic tanks, pit latrines, etc.)

Ensuring that all the human wastes are collected safely confined and disposed of after treatment so as not to cause any hazard to public health or the environment.

2.3.6 Proper Operation and Maintenance of all Sanitary Installations

Promoting proper usage, regular upkeep and maintenance of household, community and public sanitation facilities;

Strengthening Nagar Panchayat (NP) to provide sustainable sanitation services delivery

In the City Sanitation Plan of Doiwala city following would be the key activities:

Collecting baseline data and concurrent use of data for implementation

- IEC Campaigns, and detailed planning
- Setting up City Sanitation Task Force and Implementing Agency
- Multi-Stakeholder Meeting,
- Public Resolution and IEC Campaign
- Fixing Permanent Institutional Responsibility and Sanitation Implementation Roles
- Specify legal and regulatory Responsibility
- Technology Choice: up gradation, new investments, O&M Management
- Evaluation of 100% Sanitation Status
- Monitoring of 100% Sanitation Status
- State and City Level Reward Schemes
- City Wide Sanitation Plan (CSP) and Financing – consultations
- Special Approaches for Sanitation for the Poor
- Capacity Building roadmap, including the incremental targets for achievement of goals.

CHAPTER- 3

WASTE WATER MANAGEMENT

3.1 Liquid Waste Management / Waste Water management/ sewerage and sewage treatment scheme

As per the secondary data analysis from ULB Doiwala, average daily water supply is 70 Lpcd. As per the sewage return factor of 0.80 (80 percent of the water supply of Lpcd) the existing waste water generated is about (based on the population figure of about 10,000 persons) the total waste water generation is about 0.560 mld. (10,000 persons *70 Lpcd * 0.80 return factor * 1/ 10, 00,000). Nallas are getting chocked due to improper and direct disposal of waste therefore bad smell in the surroundings, threats to health, bad aesthetic vision and ultimately a bad image of the city is spreading about the city and administration**.** Drainage facilities must be proper in the town especially near mill area, markets, and hotels to manage the bulk amount of waste water. As the town is not industrial in nature therefore the grey water problem is not very serious in the town. The main component of the municipal liquid waste includes sullage and the liquid waste from the open road side drains.

3.1.2 Sewerage Management

Sewer System as well as Sewage treatment works do not exist in Doiwala town. This town is a statellite town of Dehradun which is capital of Uttarakhand State. Since Dehradun is located in Valley, scope of further development for Dehradun is limited in view of these circumstances, rapid growth and development of Doiwala town is highly anticipated.

Doiwala town has all the modern amenities such as Schools / Colleges, Telephones, Electricity, Drinking Water, Primary Health Centre, Hospitals, Small Scale industrial units and Commercial Trade Centers. Therefore it is necessary to provide Sewerage and Sewage Treatment works in Doiwala town. The provision of Sewer System and sewage Treatment works has been done on the latest design Criteria/Norms and in accordance with the provisions in the Manual of Sewerage and Sewage treatment CPHEEO, Ministry of Urban Development, Govt. of India. Important and Major Norms /Standards are as under.

Design of effluent disposal facilities for the collection, treatment and disposal of wastes is dictated primarily by the estimated organic loadings to be handled. In developing such estimates, it is necessary to determine on a unit basis not only the flow or volume of waste but its strength and composition too. With respect to flow, peak flow rates must be known in order to determine the required hydraulic capacities of sewer, pumping stations, treatment plants and effluent disposal facilities. Similarly, strength and composition must be known in order to determine the degree and type of treatment required to produce as effluent of acceptable quality. A study of waste volumes and its characteristic are a preliminary necessity to the development of Design Criteria.

As a preface to a detailed discussion of flow determine, attention must be directed to the three important components of waste water volume. Of these, the first consists of sanitary sewage, the second industrial waste, and the third consists both, the sub surface water which enters through manhole openings and unauthorized drain connections. The third component is termed seepage, depending on the means of access, either infiltration or storm inflow. It is necessary to consider the total sewage volume in terms of peak, average non peak flow in accordance with the rate of water supply, in order to determine in normal loading to be imposed on major units of a treatment plant, hydraulic capacity required for sewage, pumping stations & rising mains etc. Unit or per capita sewage flow are conventionally determined from a study of a recorded flow data and population served. Then with the basic data of present flow at hand future changes are to be projected and suitable future design allowance are determined.

A reliable figure regarding per capita flow of sewage to the population served cannot be arrived at from field tests only, however efforts have been made to assess the sewage flow considering other connected factors, they indicated that the per capita sewage quantities within India are estimated to be between 70% to 90% of the established per capita water supply allowance. Hence for design purpose the quantity of sewage expected to be obtained from residential areas within the Corporations, is estimated to be 80% of the established per capita water allowance and has been adopted for design purposes.

It is very desirable, for promotion of the economy and welfare of the town, that the municipal sewerage system be capable of receiving all liquid industrial wastes, which would otherwise create a health hazard or public nuisance. Certain type of industrial wastage, however, will

require pretreatment up to certain standard as specified by the Indian Standard Institutions & Public Health Engineering Manual (Govt. of India) in order to provide protection to the sewerage System.

In area to be provided with separate sanitary sewer, it is neither necessary nor desirable that hydraulic capacity be provided in the sanitary sewer for all of the water consumed and wasted by the industries. Sizeable quantities of industrial water consumption are for cooling purpose & steam generation and because the waste water from such process is generally not objectionable, it can be discharged safely into the open storm drains etc. Under such circumstances it is expected that 50% of the industrial water consumption will be discharged into the sewerage system. This value has been found in general to be reasonable allowances for large industrial areas where suitable regularity controls are applied.

While planning any sewerage system it is primary importance to provide a safe and effective disposal for the wastes to be collected. The various factors governing the disposals of the wastes to establish in the general terms and in the context of present knowledge, reasonable effluent quality criteria for the various wastes discharges.

The following factors have been taken into account for waste discharge criteria:-

(i) The water quality levels that are to be maintained in the receiving waters depend upon the uses of these waters in down stream.

(ii) For every beneficial use of receiving waters, there are certain water quality requirements which must be met to assure that the water will be suitable for that beneficial use.

(iii) The waste assimilative capacity of receiving water is limited and the addition of waste materials may change their chemical, physical and biological characteristics without necessarily creating significant adverse effects on the beneficial water use

(iv) The formulation of waste discharge requirement should be designed so as to (a) secure that degree of care in the planning and operation of works for the treatment and disposal of sewage and industrial wastes as will adequately protect the public health and other beneficial uses of waters, and (b) at the same time permit the legitimate planned usages of those waters

for receiving suitably prepared wastes so that an orderly growth and expansion of cities and industries may be possible.

The sewerage system has been designed on the basis of without making provision for any storm water. The storm water that will find its way into the system shall be bye - passed into the storm water drains. A provision for sewage treatment plant has also been proposed. For sewage treatment various options are examined, out of which treatment plant based on membrane based technology is to be constructed.

The design period has been taken as 30 years after accounting for a lag period of 2 to 3 years. Base year has been taken as 2013. Middle stage and design stage has been taken as year 2028 and 2043 respectively. Population of Doiwala town based on the year 2001 census is 8047. Projection of Population for different stages of the scheme has been done by the standard prescribed method. The base year population has been taken 16000 and the design population taken 25000. The design rate of water supply has been taken as 135 liters per capita per day with 15 percent extra for wastage as adopted for water supply system.

The tentative Cost of the DPR of **Doiwala Sewerage and Sewage Treatment Scheme** is estimated to Rs. 4862.00 Lacs against which an amount of Rs. 2347.00 Lacs is being proposed for Phase – I .

Table: 3.1 showing estimated cost of the development of the sewerage system

S.No.	Particulars	Cost as November 2010(Rs. In Lacs.)	
		Total	**Phase -1**
1.	Cost of sewer system and appurtenant works-23 km	2300.00	1000.00
2.	Sewage pumping station	180.00	180.00
3.	Rising main for sewage pumping station	5.00	5.00
4.	Pumping plant for sewage pumping station	20.00	20.00
5.	Sewage treatment plant and related works	500.00	300.00
6.	Cost of land acquisition	300.00	300.00
7.	Mobile flushing van and other T & P for maintenance	100.00	100.00
8.	Cost of sewage farm development	500.00	
	Sub Total	**3905.00**	**1905.00**
9.a	Staff quarters @ 3% of the work cost	195.25	95.25
9.b	Special tool and plants @ 0.5% of work cost	19.53	9.53
9.c	Maintenance for one year	50.00	20.00
	Total	**4169.78**	**2029.78**

Table- 3.2 showing sewerage system cost in the town Doiwala

S.No.	Particulars	Cost of work (Rs. In Lacs.)		%	Amount as on November 2010	
		Total	Phase -1		Total	Phase -1
1.	Cost of works	4169.78	2029.78		4169.78	2029.78
2.	Work charged establishment	4169.78	2029.78	2%	83.4	40.6
3.	Contingencies	4169.78	2029.78	3%	125.09	60.89
				Sub Total	**4378.27**	**2131.27**
	Departmental supervision charges (Excluding cost of Land Acquisition) (4169.78-300.00=3869.78) (2029.78-300.00=1729.78)	3869.78	1729.78	12.50%	483.72	216.22
				Total	**4861.99**	**2347.49**
				Say Rs	**4862.00**	**2347.00**

3.2 Septage Management

There is no septage clearance vehicle with the ULB as all the 1433 households are having their own septic tank/twin pits/single pit system and the clearance of pits is whole sole responsibility of the households. The DNP does not maintain record of septic tank user households and there is no monitoring of septage clearance. There is very little information available regarding the cleaning of tanks / pits through private cleaners this situation reflects that most of the tanks are not cleaned on regular basis. There is no record available with the ULB regarding the cleaning of the septic tanks. It shows that there is no proper septage management arrangement in the town at Nagar Panchayat level and it needs adequate attention to keep the environment safe and clean.

CHAPTER- 4

Drainage System

Doiwala Nagar Panchayat water supply reorganization scheme, district Dehradun has been prepared in compliance and direction issued by the Managing Director vide Letter No. 47/ Pra. Virchan. Master Plan Dated 18-01-05 (annexure I) Chief Engineer (GARHWAL) , Uttaranchal Panchayat Jal Sansadhan Vikas Nirman Nigam , Pauri vide Letter No. 79/ peyjal Sa. Dated 17-01-05 (annexure II) and under the guidance of SE, IX circle , Uttaranchal Peyjal Sansadhan Vikas Avam Nirman Nigam, Dehradun , in view of the policy of Uttranchal State Govt. for safe and adequate drinking water to the public , under the guidelines issued by CPHEEO , the Govt. of India time to time. So in accordance of the above this detailed project Report and estimate has been prepared to provide drainage facilities in Doiwala Town of District Dehradun.

4.1 Existing Scenario of the drainage System in the Town

At present the drainage water is flowing through the existing drains, which are not adequate and constructed in the unplanned way. Most of the water flows on roads and on other vacant lands of the town. This town is a satellite town of Dehradun, which is a capital of Uttrakhand State. Since Dehradun is located in valley, scope of further development for Dehradun is limited in view of these circumstances, rapid growth and development of Doiwala town is anticipated.

4.2 Drain cleaning

There are open channels along the major road of the town to drain the rain water these open channels are locally known as “gulls”. The total length of the smaller open drains in the city is 3.73 kms. These drains are cleaned manually time to time. The waste collected from cleaning of these drains is carried with the help of tractor trolley to the dumping site near keshavpuri area.

4.3 Necessity for Providing Drainage Scheme

As stated and discussed in the above paragraphs, Doiwala town of Dehradun district, which is very near to Dehradun Capital town of Uttarakhand , and have all modern facilities will be the twin city or come under the expansion of Dehradun. Therefore it is essential to provide the proper drainage facility in this town to improve the health conditions of the people of the town and to protect the roads of the entire town. The roadsides open drains were found choked at few places due to

collection of road garbage and solid waste and polythene waste. This situation creates problem during rainy season as due to choking of drains the rain water could not find its way for flow and causes water logging in the locality.


Pictures: 4.1-4.2 showing drainage problem near railway line area

Domestic liquid waste / waste water is ultimately made to discharge in to the open nallas through big open drains in the town. At most of the places where people have open spaces in front of their houses they have channelized their kitchen waste water in to their kitchen garden for irrigation purpose as all the road has not been supplemented with roadside open drains.




Pictures: 4.3 to 4.6 showing existing drainage system in the town Doiwala

4.4 Population Projection

The Doiwala town is administrated by Nagar Panchayat Doiwala. The future expansion of the town can only take place towards south west and to some extent towards east along National Highway. The town is divided into two drainage zone on either side of railway track.

Table 4.1 - Population of Doiwala town in different decades as per census records

Year	Census population	Decadal increase	Incremental increase	Ratio of increase %ge increase
1971	5464	-	-	-
1981	7983	2519	-	0.4610/46.10
1991	7476	(-)507	(-)2012	(-)0.0640/6.35
2001	8047	(+)571	(+)64	(+)0.0760/7.64
	Total	2583	(-)1948	47.39
	Average	X=861	Y=(-)974	R=15.80

4.4.1 Geometrical Mean of Percentage Increase

Rg = (0.4610 X 0.0640 X 0.0760) 1/3 = 0.131

4.4.2 Arithmetical Progression Method

(i) Population in the year 2010 – 8047 + 0.9x861= 8822 say 8820
(ii) Population in the year 2025- 8047 +2.4x861=10113 say 10110
(iii) Population in the year 2040-8047+3.9x861= 11405 say 11400
(iv) Population in the year 2060-8047+5.9x861=13127 say 13130

4.4.3 Geometrical Progression Method

(i) P 2010 – 8047 x (1+0.131) 0.9 = 8990 say 9000
(ii) P 2025- 8047 x (1+0.131) 2.4 = 10813 say 10800
(iii) P 2040 – 8047 x (1+0.131)3.9 = 13006 say 13000
(iv) P 2060 – 8047 x (1 + 0.131)5.9 = 16637 say 16600

4.4.4 Incremental Increase Method

(i) P 2010 = 8047 + 0.9x 861 + 0.9 (1+0.9/2) (-974) = 7551 say 7550
(ii) P2025 = 8047 +2.4x861+2.4(1+2.4/2) (-974) = 4970 say 4970
(iii) P 2040 = 8047 +3.9x861+3.9(1+3.9/2) (-974) =199 say200
(iv) P 2060 = 8047 + 5.9 x861 +5.9 (1+5.9/2) (-974) = (-)9572 say -9570

NB: Not applicable as is clear above during calculation

4.4.5 Graphical Method

Population at various stages of the design period has also been projected by simple and semi log graphical methods and is given in the following table:

a. Simple Graph Method

YEAR	2001	2010	2025	2040	2060
POPULATION	8047	8550	9400	10250	11350

b. Semi Log Graph Method

YEAR	2001	2010	2025	2040	2060
POPULATION	8047	10000	15000	23000	40000

4.4.6 Average percentage decade increase method:

Population for the year Pn = Pax (1+ r x0.01x n)

(i) P2010-8047x (1+15.80x0.01x0.9) =9191 say 9200
(ii) P 2025 – 8047 x (1+15.80x 0.01x2.4)= 11098 say 11100
(iii) P 2040 – 8047 x (1+15.80 x 0.01 x 3.9) = 13005 say 13000
(iv) P 2060- 8047 x (1+15.80x 0.01x5.9) =15548 say 15550

Table 4.2 showing Summary of population projection

S. No.	Method	Year				
		2001	2010	2025	2040	2060
1	Arithmetical increase	8047	8820	10110	11400	13130
2	Geometrical Increase	8047	9000	10800	13000	16600
3	Incremental Increase (not applicable)	8047	7550	4970	200	(-)9570
4	Simple Graph	8047	8550	9400	10250	11350
5	Semi Log Graph	8047	10000	15000	23000	40000
6	Average Percentage Decade Increase	8047	9200	11100	13000	15550
7	Through the method already approved by CPHEEO	8047	12600	17500	24500	41900

Future population projection has been done by the different standard prescribed methods , the projected population figures arrived at by the arithmetic increase , incremental increase , simple graph and the average percentage Decade Increase Method are on the lower side , population figures arrived by the semi log graph method confirm and are close to the pattern of population growth of Doiwalatown. The projected population figures worked out by the above methods is attributed to the fact that the census population figures of the town for the census in the year 1971 and 1981 pertain to the town with status as village and the subsequent decadal population in the year 1991 and 2001 are after Doiwalawas upgraded to the status of Nagar Panchayat.

CPHEEO, Ministry of Urban Development and Poverty Alleviation , Nirman Bhavan , Government of India , New Delhi have vide their Letter No. Q- 12045/29(S) – CPHEEO dated 14/02/2003. Approved the population projected adopted and the proposals under the detailed project report for DOIWALAWater Supply Reorganisation Scheme. In this DPR base year has been adopted as 2004 and the population for the base year taken as 11000. Further projection of population is based on the increase in population of District Dehradun which is 24.71 percent during the decade 1991 to 2001.

Therefore adopting this pattern of population growth under this DPR , population projection has been done taking base year as 2008. Thus adopting population in the year as 11000, further projection of population has been worked out as detailed below.

Population year 2004 11000

Population base year (population 2004 x (1+24.71x 6/10x100) say 12600 2010= 12630

Population year 2014 = 13718 (population 2004 x (1+24.71/100)

Population year 2024 = 17108 (Population 2014 x (1+ 24.71/100)

Population Middle Stage (population 2024x (1+ 24.71 x 1/100) say 17500 2025=17530

Population year 2034 = 21335 (Population (population 2024x (1+ 24.71/100)

Population ultimate stage (Population 2034 x (1 +24.71x6/10x100) say 24500

Year 2040= 24498

Population in the year (Population 2034 x (1+24.71/100) 2044= 29237

Population in the year (population 2044 x (1+24.71/100) 2054=36461

Population at the end of (population 2054 x (1+ 24.71x6/10x100) say 41900

Master Plan Period = 41867

For assessment of future population of Doiwala Town floating population, the projected population of the town at different stages of the scheme has been adopted as under

Table 4.3 showing projected population summary

S.No.	Stage / year	Projected Population		Total
		Population	Floating population	
1.	At the Stage year 2010	12600	2000	14600
2.	In the middle of design period 2025	17500	2500	20000
3.	At the ultimate stage year 2040	24500	3000	27500
4.	At the end of the master plan period 2060	41900	3600	45500

The proposals under the detailed project report have been framed on the basis of latest norms standards / design criteria contained in the U. P Jal Nigam Lucknow No. 3001 (PPRD- Design criteria/30 of date 19/1/1979 and No. 351/PPRD-Desing Criteria/2dated 19/2/1986 and the guidelines contained in the manual of Sewerage of Urban and Sewage Treatment 3rd Ddition-2001, CPHEEO Ministry of Urban development, Govt. of India, New Delhi. Main and prominent norms are summarized below. The proposal have been worked out for design period of 30 years, the base year has been adopted as 2010 middle stage, Ultimate stage and the end of Master plan period after 50 years have bee adopted as 2025, 2040, and 2060 respectively.

4.5 Design Criteria

The design criteria are based on the different practices adopted in this county and as per experience gained by the department in executing such schemes. The details are as below:

1. Run Off :- Run off for designing of storm water drainage system has to be calculated on the basis the Rational formula as below-

Q = C.I.A.

Where Q = the maximum rate of runoff form the drainage area in cusecs (cubic feet per second)

C = the runoff coefficient of the ratio between the maximum rate of runoff and the average rate of rainfall during the time of concentration.

I = the average rain fall intensity in mm per hour for the period of maximum rain fall off a given frequency of occurrence having a duration equal to the time of concentration.

The drainage area A in hectare can be measured from Topographical plan or maps however proper values of C and I must be estimated from the recorded data and experience.

(A) Run off Coefficient:-

The value of c will depend upon general soil condition of the area, typical rain fall characteristics condition of surface and degree of land development both present and future the various values of runoff coefficient to be adopted conditions is given as below :-

Runoff Co=Efficient Of different Surfaces

Table 4.4 showing various runoff co-efficient for types of surfaces

Type of surfaces	Runoff co-efficient
Water tight roof surfaces	0.7 to 0.95
Asphatt pavement in good order	0.85 to 0.90
Stone of brick pavements in cement mortar:-	
(Good quality)	0.75 to 0.85
(Good jointed)	0.50 to 0.70
(Good quality)	0.40 to 0.50
Macadam Roadways	0.25 to 0.60
Gravel Roadways and Walks	0.15 to 0.30
On paved surfaces railroad and vacant lots	0.10 to 0.30
Parks, Gardens, lawns meadows (depending upon the surface slops and soil characteristics	0.25
Wooden areas of forest land depending as before	0.01 to 0.20

In a particular locality of certain if A, A2, A3, etc. are the different types of surface areas having C1, C2, C3, etc. as their runoff co-efficient the over all runoff coefficients for the locality would be

$$\frac{A1\ C1 + A2\ C2 + An - Cn = Ao = C}{A1+A2 + +AN}$$

Since in large towns it will be difficult to calculate value of runoff coefficient as above it is suggested that the following table based on per area density be taken as runoff coefficient.

Table showing Runoff Coefficient for Different Types of Localities

Type of locality		Average approximate density Persons/Acre	Runoff Coefficient
1	Extreme suburban areas with widely, detached houses	20 to 50	0.35
2	Suburbs with detached houses	50 to 100	0.45 to 0.55
3	Localities with semidetached houses	150 to 200	0.65
4	Closely built up areas	200 to 250	0.75
5	Highly congested areas	More than 250	0.85 to 0.90

This runoff coefficient has to be selected after considering the future development town.

1. a. Intensity of Rainfall:-

The average rainfall intensity is derived from records of local rainfall rates and the times concentration i.e. the time required for runoff from the remotest part of the drainage area reach an inlet and these flow through the drain to the point under consideration.

Duration of storm vs intensity of rainfall curve for all storms for different period occurrence is given in annexure I for different towns this will be different and shall be prepare from the rainfall data available at the nearby meteorological station.

b. Time of Concentration

The time of concentration is the time allowed for water to reach at the head of the section of the drain. In general this has to be taken as 30 minutes except while the drain is very close by in which case it should be taken as 20 minutes. This includes 15 minutes time within the house premises. The time required in the drain is calculated with the velocity of 1m per second.

The intensity of rainfall for calculating the runoff for any area is then taken from the curve such that the duration of rainfall for calculating the runoff for any area is then taken from the curve such that the duration of rainfall is equivalent to the time of concentration for such storm will produce the maximum runoff in that area. The intensity I for any particular time of concentration is different period of concurrence. Normally a rainfall with period of occurrence as once in two year is taken for design until unless some specific site conditions required it otherwise.

2. Flow Formula

The velocity in the storm water drain is calculated in the basis of Chezy's Formula.

$V = 1/n (R)^{2/3} X (S)^{1/2}$

Where V= mean velocity in meter per second

R= Mean Hydraulic radius

S= Slope of hydraulic gradient

n= Coefficient of roughness

n is Co-efficient whose value is given as below:-

A. BRICK WORK :-

Well laid brick work	=	0.013
Average brick work	=	0.015
Rough brick work	=	0.017

Normally figure of 0.015 is reasonable and is adopted in brick work.

B. Concretes with surface as indicated below:-

(i) Formed no finish	0.013	-	0.015
(ii) Trowel finish	0.012	-	0.014
(iii) Granite good section	0.015	-	0.019
C. (i) Dressed stone in mortar	0.015	-	0.017
(ii) Random stone in mortar	0.015	-	0.020
(iii) Cement rubble masonry plastered	0.016	-	0.020

In case of earthen section it is taken as 0.0225

3. VELOCITY:-

Maximum velocity inside drain should be not exceeding 2.0 meter per second. The minimum velocity should not be less than 0.7 meter per second. In case of internal storm water drains depending upon the topography the minimum value could be 0.4 m/sec.

4. CROSS SECTION

Normally trapezoidal cross section with side slope as 1. land having center portion depressed so that when the discharge is low flow may be limited to center portion has to be provided. Where the soil conditions fairly good side slope of 1.5:1 vertical to horizontal could also be adopted. In some cases where site condition dictates otherwise rectangular or semicircular section could also be used.

5. FREE BOARD

15 cm free board should be provided above the flow level on main roads 225 mm high. Parapet on the face towards roads has to be constructed above the ground level in a length of 1.5m giving up a gap of 30 cm for access of water in to the drain.

6. WHEEP HOLES

Weep holes have to be spaced at 1.5 meter horizontally and vertically and should be size 8X 5cm having dry brick ballast 20x20x30cm padding.

7. DRAIN SECTION:-

Normally the specification for drain should be 1:6:12 cement concrete with brick ballast 8 cm thick at bottom and brick on the edge flooring in cement mortar 1:6 the sides should be of dry on edge, at the top bull nosed bricks in cement mortar 1:6 have to be provided. Flush pointing to be done with cement mortar 1:3.

8. DROP IN BED:-

When a branch drain joins a main drain the discharge in the main drain or the bed of shape of a drain changes from steeper to flatter at any section the size of the drain after that section has to be made bigger. In case where the depth is increased to provide larger of flow then care should be taken that the highest flood level on out going drain should remain lower a

or at the most same as the maximum highest flood level of the incoming drain or otherwise a vertical drop in the bed of the drain has to be provided. A vertical drop up to 4 cm should be accomplished by giving steps in the brick pitching itself. The bed and sides of the drain 30 cm up stream and 60 cm down stream of the drop should be provided with half brick masonry in cement mortar. In cases where drop is more than 4 cm, it should be provided by constructing vertical masonry walls.

9. CHANGE IN VELOCITY:-

The change in velocity inside the drain should not occur abruptly. For every increase in velocity by 0.3 meter per second the distance along the drain should be 4.5 metre.

10. FALL FROM A BRANCH DRAIN IN TO MAIN DRAIN:-

Where the fall from a branch drain to a main drain is above 15 cm 4cm cement concrete flooring over 10 cm. Lean concrete should be provided in the main drain bed in length equal to the width of water surface in the branch drain plus 30cm.

The bed and side of the drain on up stream side of any culvert should be provided with half brick masonry in cement mortar 1:4 for at least 1 meter length and the side plastered with cement mortar 1:4 also where branch drains meets main drain the bed and sides of the main drain should be provided with half brick masonry in cement mortar 1:4 for 1 meter length symmetrical about the branch drain and the sides of the main drain be plastered.

11. DRAIN BEGINNING AND DRAIN CURVES:-

The bed and sides of a drain at beginning and at sharp curves shall be provided with half dry brick pitching and plastered over with cement mortar 1:4 a curtain wall at the end of the drain shall also be provided to prevent accruing and undermining in drain.

12. OUT FALL DRAINS:-

At curves brick masonry breast wall in cement mortar 1:6 shall be provided. The highest flood level of the outfall drain shall be kept at least 3-6 above the highest flood level of the Nallas in to which the storm water would be discharged, however attempt should be made to keep it as much as possible.

13. CULVERTS:-

The minimum span of the culverts should be 60cm with minimum over all depth of either 30 cm or depth of water plus 15 cm free board below bottom of slab which ever is more irrespective of the design requirement. The length of culvert has to be as per U.A.P.W.D practice which various from 32 ft. minimum to 38 ft. maximum. The culverts have to be designed as I.R.C. code.

4.6 Parameters:

1) The area of entire town, from where the rain water may come will be 291 hectare as per map prepared of the town by doing actual survey.

2) Contour survey has been done and maps showing levels will be used for designs.

3) The rainfall data used in the design of this scheme is of 25 years obtained from meteorology Department of India.

Table 4.5 showing rainfall data to be used in the design

Month	Rainfall (mm)	Relative Humidity	Temperature		
			Max	Min	Ave.
January	46.9	91	19.3	3.6	10.9
February	54.9	83	22.4	5.6	13.3
March	52.4	69	26.2	9.1	17.6
April	21.2	53	32	13.3	22.7
May	54.2	49	35.3	16.8	25.4
June	230.2	65	34.4	29.4	27.1
July	630.7	86	30.5	22.6	25.1
August	627.4	89	29.7	22.3	25.3
September	261.4	83	29.8	19.7	24.2
October	32.0	74	28.5	13.3	20.5
November	10.9	82	24.8	7.6	15.7
December	2.8	89	21.9	4.0	12.0
Average Annual	2025	76	27.8	13.3	20.0

Maximum rainfall occurs from june to September , i.e. total average rainfall for monsoon period is 1749.70mm (Based on the rainfall datas for 25 years available from the website www.dehradun.nic.in) since total number of rainy days are not known in these months, following assumptions are considered as (june 10 days , july 10 days , August 20 days and September 14 days). Total rainy days on monsoon climate are 64 days. Hence intensity of rainfall is 1749.7/64=27.33 mm say 30 mm. Intensity of rainfall is always taken from maximum rainfall will occur as maximum in 1 hour, so the design discharge is taken as 30 mm/ hour. It is also supported by the data of climatological table of Govt. of India (Annexure A) as it shows maximum rainfall in one day as 487 mm, and it is supposed that it occurred in 16 hours so it worked out 30 mm per hour.

4.7 Planning for Design:-

As per contours available topography and existing geographical features of the town. The entire area of the town may be divided into two districts for drainage purpose. Main consideration is of railway line, because to cross the railway line is very expensive proposal, so due to economical Ccnsideration and contours availability the entire town has been divided as given below.

The one part of the town is north east side of the town above Dehradun, Haridwar railway line, termed as district 1. The entire drain water of this district will be disposed in the river song up stream of bridge over Haridwar road.

The other part of the town is south, west part of the town below Dehradun Haridwar railway line called as district 2. The entire drain water of this district will be disposed in Susva River down stream of bridge over road.

4.8 Shape and Type of Section:-

The comparative economics of different shape and types of drains has been shown in the chapter of design criteria. The composite section trapezoidal cut rectangular in shape in found to be the most economical section and has been adopted. The sizes of sections have been worked as per Manning's formula given in Technical Note.

The drains will be constructed in Ist class brick work in cement mortar 1:4, above 10 cm P.C.C in 1:3:6 to support the sides and base. The plastering of the drain surface in 1:4 cement mortar will be done on inner surface of the drain. The plaster will be 12 mm thick on section having velocity more

then 2 mts/ sec. The plaster will be rendered smooth so that the value of rugosity coefficient may be less. The slope of slide walls has been kept as 1:1.

4.9 Structural Design of Drains:-

The structural design of drains is based on following assumptions , but the actual parameters be ascertained at the time of execution and corresponding adequate changes be ensured.

1) It is assumed that water table is sufficiently below the lowest G.L. i.e. about 6m below G.L. and there will be no uplift pressure due to ground water.
2) Drains will be constructed in the green verge of the roads and no surcharge due to wheel load will come on the drains.
3) Unit weight of dry soil taken as 1.5 tonnes/ cu.m.
4) Void ratio is taken as 0.75
5) Saturated unit weight of soil assumed as 1.94 tonnes / cu.m
6) Maximum coefficient of sliding friction between soil and foundation concrete = 0.7
7) The soil considered to be Sm-Sc type for which the values of angles of internal friction o= 35º and cohesion is taken as 0.914 t/m2. Bearing Capacity has been taken as 10.75 t/m2

Other important points to be kept in mind are adhered to during execution, are given as follows:-

In all such reaches where drainage discharge varies from beginning to end, it is advised to proportionally reduce the average width (designed for height discharge in the reach) , keeping invert R.L. same and slope same.

4.10 Land

Land is available by the side of Dehradun – Haridwar Highway for construction of drains. Land is also available along the other roads of town where drains are proposed. The drain constructed earlier will be dismantled and new designed drains will be constructed. In view of above no provision for cost and acquisition of land is being made in this estimate.

4.11 Schedule of Rates

For estimates of cost of proposed works, rates of labour and materials approved by the Superintending Engineer IXth circle, Uttaranchal Jal Nigam Dehradun have been incorporated in working out the item rates of different works. The rates for road cutting and reinforcement as approved by Uttranchal Government have been incorporated. The cost of shifting of telephone,

electricity and water pipeline have been incorporated on the basis of rates that are being charged by these departments.

4.12 Period of Completion of Works

The period of completion of the proposed works has been provided as two years in view of the quantum of works involved and the position of allocation of funds.

4.13 Maintenance

The drainage works after execution, will be maintained by the existing staff of Nagar Palika Parishad, Doiwala.

4.14 Funding

The funding of proposed works will be made by Government of India / Uttaranchal Government to Uttaranchal Jal Nigam. Considering that the proposed works are of social nature and are not likely generate any revenue, the assessment of economics is not feasible.

4.15 Conclusion

This estimate for prevention of water logging and to check damage of roads by construction of Storm Water Drains and outfall drain for ultimate disposal of storm water in to Song River amounting to Rs 879.90 lacs is submitted for approval and allotment of funds.

OFFICE OF THE EXECUTIVE ENGINEER, CONSTRUCTION DIVISION, UTTARAKHAND

PEYJAL NIGAM, DEHRADUN.

DOIWALA DRAINAGE SCHEME

MASTER PLAN

FORM 'J'

S.No.	Particulars	Centage	Cost in Rs. Lacs as on March 2011
1-	Cost of works		782.13
2-	Department fee Rs. 782.13	12.50%	97.77
		Total	**879.90**
	Total cost of Project		**879.90**

OFFICE OF THE EXECUTIVE ENGINEER, CONSTRUCTION DIVISION, UTTARAKHAND PEYJAL NIGAM, DEHRADUN.

DOIWALADRAINAGE SCHEME

MASTER PLAN

GENERAL ABSTRACT OF COST

S.No.	Description of works	Amount
		(in Lacs Rs.)
1	a) Cost of Drainage System Zone I	370.74
	b) Cost of Drainage System Zone I	366.34
2	Provision for special T &P 0.5%	737.08
3	For six month maintenance	3.68
		740.76
		3.70
	TOTAL	744.46
4	Work Charge Establishnebt @ 2% on Rs. 744.46	14.89
		759.35
5	Contingencies @ 3% on Rs. 759.35	22.78
	Total	782.13

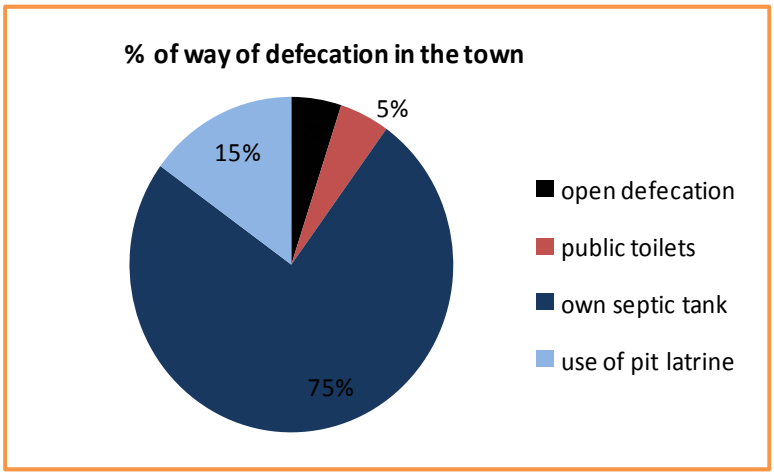
CHAPTER 5

5.1 Existing Sanitation & Environmental Scenario in Doiwala

There are problems of waste management in the town as the town is growing in terms of its population and development activities. About 40,000-50,000 people visit the place in a month for agricultural and other business activities city have a load of about 1500 daily commuters. As per the primary and secondary data analysis total waste generated per day in DNP is about 05 MT.

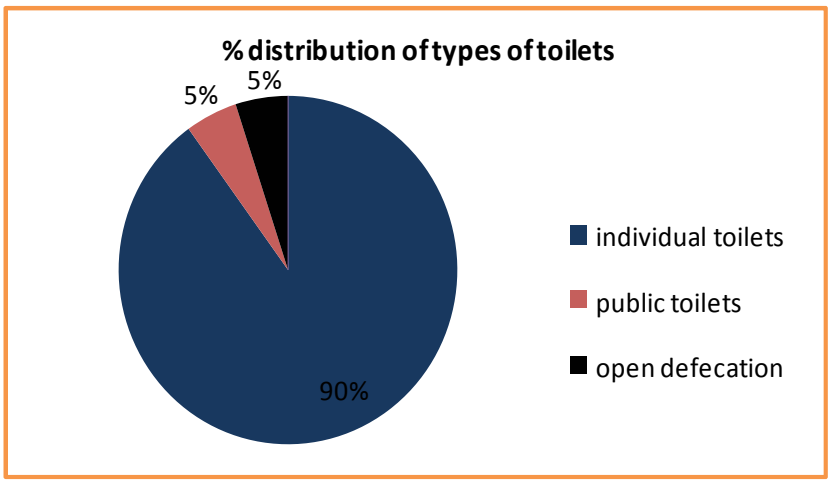
5.2. Household Sanitation

As per the analysis of the collected primary 30% sampling based data and secondary data in 2010 it was found that nearly 90 % households had access to individual toilets facility. The split of this 90% indicates that about 75 % households accessing latrines having own septic tanks about 15% households have pit type latrines and less than 10% households accessing other (public) latrines. Out of the total about 5 % population lacked access to any household sanitation facilities. This group of households usually practiced open defecation, nonetheless, a few used public toilets.



Picture 5.1 showing % distribution of open defecation in the town

As per the ULB figures the number of households using public toilets is about 25 while number of households practicing open defecation is about 20 but actual



Picture 5.2 showing types of toilets in the town

Figure of people practicing open defecation is higher than this due to daily commuters and temporary migrants and visitors.

5.3 Sanitation Scenario for the Floating Population in the Town

Town Doiwala is an important place due to its nearness to the Jollygrant airport, Railway Station and religious place like Rishikesh and Haridwar of the Uttarakhand State. On an average about 1500 People visit the town daily (40,000 to 50,000 per month) for various purpose as business activities etc this figure includes all the visitors, daily commuters etc. out of all these the temporary visitors are the main group of the people who performs open defecation and urination along the railway line and nearby area because the town does not have the optimum amount of public toilets due to this the problem is becoming worse in one or two wards. There is only 1 public toilet and 1 community toilet for daily floating population of about 1000-1500 it is highly inadequate furthermore the O & M of these toilets is not so efficient therefore most of the floating population used to avoid the usage of this toilet. All this lead to performance of open defecation and open urination. The problem is more prominent near railway line area of the town. Providing sufficient number of public conveniences are urgently required for keeping the city and public places clean in the town.

5.4 Public and Community Sanitary Arrangements

As a growing town adequate public / community sanitary facility is an urgent need of the town as the problem of open defecation is increasing day by day mainly along the area of railway lines and it is becoming difficult to stop this kind of nuisance because most of open defecation is being practiced very early in the morning. Providing adequate public / community sanitary conveniences is therefore a critical requirement for maintaining sanitation in public places.

Poor sanitary measures and poor operation and maintenance of public and community toilets also enforce people to avoid usage of these public toilets therefore construction as well as better maintenance arrangement is on priority demand to stop open defecation cases in the town. An adequate number of public and community toilets are recommended on the specific location and at specific distance to stop the cases of open defecation and to achieve one of the important objectives of the city sanitation plan.

Picture 5.3-5.4 showing lack of O& M of School & public toilets

1.GOI sponsored 'National Slum Development Programme' suggested – 35 users per day per seat; while world Bank funded 'Mumbai Slum Sanitation Programme' adopted – 50 users per day per seat.

CHAPTER 6

6.1 Solid Waste Management

At DNP level SWM is looked after by EO directly, sanitary workers, supervisors work under the EO. All the workers reports to supervisor or directly reports to EO. Total strength of sanitary staff is 15. DNP has initiated the process of constituting Mohalla Swachata Samitis therefore this number is likely to increase in the coming time.

The organization structure of health / SWM department of NP Doiwala is given in introductory chapters.

Table: 6.1 details of sanitation workers and supervisors

Total No. of Ward	Population (census 2001)	Permanent	Temporary / Daily wages	Total workers	Supervisor
07	8047	5	10	15	1

Source: DNP

6.2 Problems of waste generation and disposal in the town

Including the residential source as main waste generator in the town many hotels and restaurants, hospital and nursing homes are also generating additional waste in terms of vegetable, foods and shop waste and hazardous waste. In future more waste will generate thus the city needs support in the management of sanitation facilities. Total 33 dustbins big and small has been placed in all seven wards. The collected waste is dumped near Rajeev Nagar on Rishikesh road in Keshav Puri Area (land of Gram Panchayat) as the trenching ground facility is not available in the city. As far as the number of sanitary assets is concerned with the DNP there is only one tractor trolley with the ULB to transport the waste to the dumping site. Further, there is little data available on health impacts of sanitation and hygiene practices in the city.

Picture 6.1 to 6.5 Showing problems of garbage disposal in the city Doiwala

The Baseline survey conducted by the Nagar Panchayat has shown the willingness of the household for having individual or public toilets with proper community sanitation facilities management. Cleaning of open drains on the roadsides is the major problem in all the wards that has been found during the survey that has to be taken care of on priority basis similarly the problematic issues of spreading flees; mosquitoes and other pathogenic insects and germs have been found during the survey regarding the health issues in most of the wards. Contrary to this very less amount (only 38%) of the respondents were found willing to pay user charges for availing better facility regarding SWM and other sanitation services.

Lack of sanitation staff is big hurdle to be overcome to provide better sanitation facility without this sustainability in city sanitation cannot be expected from the other sanitation services provided in the city area. The challenge before the city is to respond to the local situation by carrying out a series of activities following the principle of the National Urban Sanitation Policy.

6.3 Methodology adopted for characterization and quantification of waste generated in the town

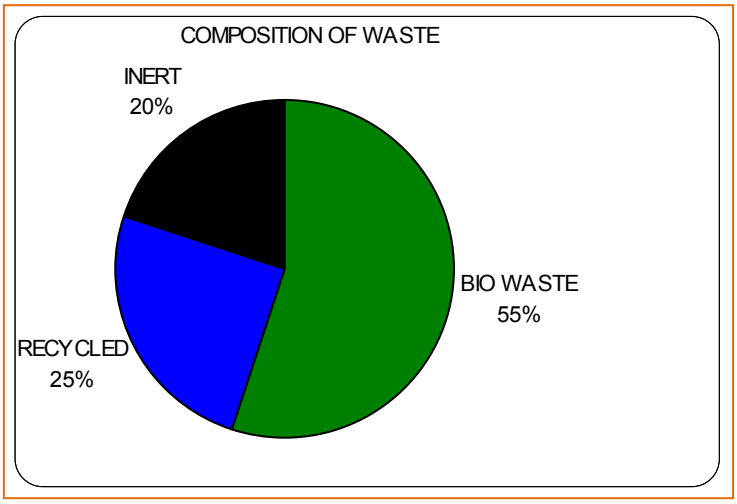
30% HHs based survey was done from all types of income groups. Average quantity of waste generated and its type was asked to them. As per the solid waste management DPR for Dehradun, per capita waste generation can be considered as 205 gms /capita/day. Based on the primary survey revealed that waste generation rate varies between 0.12 and 0.60 kg per capita per day therefore for the study purpose an average of about 0.350 kg per capita per day waste generation can be considered for the city. The HHs was enquired about how they dispose off waste and the problem of open littering and unattended waste in the area. Based on the above steps; average per capita household waste generation in the city was calculated.

6.4 Waste Generation

The total number of households in Doiwala is about 1650 and based on the primary and secondary survey and as per capita waste generation, it is estimated that about 5 metric tonnes (MT) of domestic solid waste is generated every day. It includes the waste from households, market shops and other institutions waste and waste from other local sources.




Pictures 6.6 to 6.10 showing problems of SWM in the town Doiwala



Picture 6.11 showing % & type of waste generated in the town

As per the primary and secondary survey analysis, the town generates about 5 MT of waste per day out of which about 55% waste is compost able, 25% is recyclable in nature and rest 20% is inert materials. Total quantity of waste generated for the current year and for the next 6 years projected population has been shown in the table below.

Table: 6.2 Estimated & projected waste generation trends for next 6 years

S.N.	Particulars	Population Growth							
		2001	2010	2011	2012	2013	2014	2015	2016
1	Population	8047	10047	10298	10555	10818	11088	11365	11649
2	Per capita waste generated(kg)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
3	Quantity of MSW Generation in Ton +30% extra(Kg)	3.66	4.57	4.68	4.80	4.92	5.04	5.17	5.30

For commercial areas quantity of biodegradable and recyclable waste can be assumed as 70% MT and 30% MT respectively that is included in the total waste generated in town.

The CSP also addresses institutional, financial, health and legal aspects to make the entire system sustainable which include –

Strategy to enhance the capacities of existing levels of municipal staff along with the number of staff need to be increased / curtailed

Mechanisms for financial sustainability to support and sustain the proposed SWM systems

Strategy of IEC for ensuring the community participation

Mechanisms to improve MSWM through Public Private Partnership by involving private entrepreneurs

Legal framework and byelaws to introduce punitive measures and incentives to enforce the recommendations and MSWM rules.

In absence of appropriate systems, inadequate institutional arrangement and poor financial health of urban local bodies, city is following rudimentary methods of waste disposal. Waste is often disposed on the streets by the households, shops and establishments, the municipalities / ULBs by and large collects the waste through street sweeping and deliver the waste to secondary storage site where the waste is temporarily stored in the open spaces or in the masonry bins under unhygienic conditions. This waste is thereafter transported, often in open tractors and trolleys using manual labour and taken to dumping site.

6.5 SWM PERFORMANCE INDICATORS

6.5.1. Household coverage

The door to door collection, coverage of SWM services in terms of percentage of household is very less in Doiwala NP as in only 2 wards door to door collection is being carried out by the DNP .

6.5.2. Efficiency of collection of MSW

It has been estimated only about 50-60% about only 2-3 Tons of MSW is being collected per day on an average, out of the total 5-6 tons of waste generated

6.5.3. Extent of segregation of MSW

The value for this indicator is almost nil as there is virtually no segregation of waste at any level of MSW management waste is collected, kept and disposed off in mixed form in the town.

6.5.4. Extent of MSW recovered

The extent of MSW recovered is very less as there is no system working through proper channel in this regard. Only the informal sector (that too is very little) people are helping in this line as a part of their livelihood. There is no processing operation in the SWM chain.

6.6 Proposal for improving SWM systems

The DNP authorities have been directed to setup the waste processing and disposal facilities on their own or through a private agency or NGO

6.6.1 Prohibit Littering: ensure source segregation of recyclables and storage of waste at source

MSW rules 2000 have laid down the compliance criteria in this regard “littering of municipal solid waste shall be prohibited in cities, towns and in urban areas notified by the state government”

6.6.2 Quantity of waste to be treated and land filled

Out of the total recyclable waste generated per day , a major portion of 80- 90% will get salvaged for recycling it will reduce the quantity of the waste to be sent to the landfill site or to composting. Further major portion of the inert / construction waste i.e. 80% -90% can be used to fill low lying areas. Similarly a reasonable amount of biodegradable waste i.e. 30-40% initially would reach the compost plant or can be used for backyard composting in kitchen gardens; in parks or vacant open spaces areas in the locality. As there is problem of land available for large landfill site, cluster based approach will be adopted to make arrangement for inert waste disposal

6.6.3 Awareness programmes for segregation of waste

In order to encourage the citizens to keep the city clean, municipal authority shall organize awareness programmes for segregation of waste and shall promote recycling or reuse of segregated material. The municipal authority shall under take phased programme to ensure community participation in waste segregation for this purpose , regular meetings and discussions shall be arranged by the city sanitation task force members / representatives from local institutions , NGO's and active social workers of the town

6.6.4 Citizen's participation and involvement/community participation

Citizen's participation and involvement is must for solid waste management for this purpose SHGs have been proposed at ward level to join the housewives, students, shopkeepers and other people for the segregation and management of waste at domestic level. Community participation can be ensure by following three actions

By organizing awareness generation programme through various IEC activities

By issuing directions to the citizens through local resources and channels

Adopting enforcement measures to ensure compliance

6.6.5 Measure for Households

DNP must issue direction to citizens, prohibiting littering of waste on the streets, open spaces, water bodies, drains etc. and direct them to store the waste generated at source in two bins, one meant for biodegradable waste and another for recyclable waste. Various illustrative and awareness generation programme can be arranged to make the people aware about biodegradable and recyclable waste types , pamphlet , posters and hoardings can be used to generate awareness among people regarding identification of these two types of waste

6.6.6 Types of waste to be put in the bin meant for food wastes and bio-degradable wastes

1- Food wastes of all kinds, cooked and uncooked, including egg shells, bones
2- Flower and fruit waste including juice peels and house –plant wastes
3- Sanitary towels/toilet papers and tissue papers
4- Disposable diapers and incontinence pads
5- Ashes

6.6.7 Types of recyclables wastes to be kept for collection by informal sector / for processing

1- Paper and plastic of all kinds

2- Cardboard and cartons

3- Old stored news papers waste

4- Plastic and metallic containers

5- Packaging material waste of all kinds

6- Glass and metallic waste

7- Rags, rubber, pouches, sachets and tetra packs (rinsed)

The DNP may also take up a massive and regular awareness campaign to educate the citizens not to litter and to encourage practice of source segregation of recyclable waste and biodegradable waste. There should be two domestic bins for this purpose

6.6.8 Handling Domestic Hazardous Waste

The citizens may also be advised not to deposit domestic hazardous waste such as used batteries, discarded medicine, paints, pesticides etc. in the bins meant for biodegradable and recyclable material and instead keep the same separately as and when generated and deposit the same at the domestic hazardous waste collection centre or to be hand over to the private agency / ULB level collector

Table 6.3 showing expected benefits of managing garbage in segregated way

S.No.	Variable	Managing garbage in a mixed way	Managing garbage in a source segregated way
1.	Aesthetics of the collection	Mixed waste poor aesthetics	Segregated waste –better aesthetics
2.	Work conditions	Mixing of wastes leads hazardous & unhygienic work conditions	Segregation of waste –hygienic work conditions
3.	Sale value	Mixing of Recyclable Waste with Bio degradable Waste- low sale value	Source segregated waste- better sale value
4.	Trips of secondary collection point	Mixing of waste many trips	Segregation of waste – one trip Lesser resource / time wastage
5.	Better environment conditions	Poor environmental condition	Improved environment conditions

The illustrative list of domestic hazardous waste is given below:-

- Aerosol cans
- Batteries from flashlights and button cells
- Bleaches and household kitchen and drain cleaning agents
- Car batteries , oil filters and car care products and consumer able
- Chemicals and solvents and their empty containers
- Cosmetic items ,chemical based
- Injection needles and syringes after destroying them both
- Insecticides and their empty containers
- Light bulbs , tube –lights and compact fluorescent lamps (CFL)
- Discarded medicines
- Paints , oils , lubricants , glues , thinners , and their empty containers

- Pesticides and herbicides and their empty containers
- Photographic chemicals
- Styrofoam and soft foam packaging from new equipment
- Thermometers and mercury containing products

6.6.9 Promoting Segregation of Waste at Source

It is important to avoid –

Hindrance in waste processing as well as using up landfill space profitable use of recyclable materials could be made by salvaging it at source for recycling to save national resources and also save the cost and efforts to dispose of such wastes

The DNP may therefore draw up a regular program of conducting awareness campaign in all the wards utilizing, ward committees, RWAs, NGOs etc. Simple literature may be developed for bringing in the awareness which may be publicized through media using cable network and group meetings in different areas through NGOs.

The sanitation supervisors may also create awareness during their fields' visits.

The following measures may be taken by the DNP towards segregation of recyclable waste

Mobilizations of agencies to take up the work of organize rag –pickers and upgrade them as door step waste collectors. This can be done by offering them part time work of 4 hours for door to door collection of both biodegradable waste as well as recyclable waste. They may be allowed to collect a less amount/ charge of Rs 10- 20 per month from every house and take away the recyclable material which they collect each day to earn extra amount for their living. As an option, the collection cost could be recovered from the beneficiaries in the form of user charges or sanitation tax by the DNP or paid by the DNP from its budget to the NGO as deemed appropriate by the DNP based on mutual negotiation

The DNP may actively associate resident associations and industry associations, CBOs and NGOs in creating awareness among the people to segregate recyclable material at source and hand it over separately to the waste collector. The upgraded rag pickers on becoming door step waste collectors may be given an identity card by NGOs organizing them so that they may have acceptability in society. The DNP may notify such an arrangement made by the NGOs and advise the people to cooperate

6.6.10 Incentives Measures to Promote Source Storage and Segregation of Waste at Source

Recognising the community engaged in segregation

Rewarding key partners, groups, people on special occasions

6.6.11 Types of Domestic Bins to be used

Use of plastic or metal containers with lid is advised for the storage of food / bio-degradable/wet waste and a similar size bin or bag with or without lid may be used for recyclable material.

Two containers of 12-15 litre capacity for a family of 5 members would ordinarily be adequate. Household may keep larger containers or more than one container to store the waste produced in 24 hours having a spare capacity of 100% to meet unforeseen delay in clearance or unforeseen extra loads.

DNP may provide two containers to every BPL and low income group household for keeping recyclable material separately from food waste to promote segregation and storage of waste at source at the household level. This provision will be for initially one year. It is advisable that households invest in the source storage containers themselves later.

DNP may take assistance from the private firms for providing bins to the households by getting advertisement rights through the bins

6.6.12 Provisions of Community Bins for Posh Colonies

A private association of flats /multi-storeyed buildings etc. may be directed to provide a set of covered community bins of 100 litres capacity for 20-25 houses and advise the members of their society / association for storage of biodegradable and non-biodegradable domestic waste in these community bins separately to facilitate collection of such waste by the DNP from the designated spot

6.6.13 Provisions of shops /offices /institutions /workshops for unexpected extra loads

There are about 1170 shops in the town. All the establishments as Shops, workshops, offices and industries in the city reported by the DNP may be directed that:

They should refrain from throwing the solid waste / sweeping etc. on the footpaths, streets, open drains and open spaces

They should keep their waste on-site as and when generated in segregated manner and in a suitable container until the time of door step collection

The size of the container should be adequate to hold the waste they normally generate in 24 hours with 100% spare capacity to meet unforeseen delay in clearance

They should keep domestic hazardous waste separately as and when produced and dispose of as per directions given by the DNP

The association of large commercial complexes should provide one or more containers of the size that may be prescribed by the DNP with match with the waste collection and transportation system of the DNP for the storage of waste by their members

The association should direct their members to transfer their waste in to the community bin before the prescribed time on a day- to- day basis

The association should consult the DNP in the matter and finalize the type of bins to be used and the location where such community bins should be placed to facilitate easy collection of such waste.

6.6.14 Provision for Hotels and Restaurants:-

All the hotels and restaurants may be directed that

They should refrain from throwing their dry and wet solid waste / sweepings on the footpath, streets, open spaces or drains.

They should also refrain from disposal of their waste in to municipal street bins or containers

They should store their waste on-site in sturdy containers of not more than 100 litre capacity each

They shall keep hazardous waste separately as and when produced and dispose it off as per the directions of the DNP. In case of large hotels and restaurants where it may not be convenient to store waste in 100 litre or smaller size containers they may keep large containers matching with the primary collection and transportation system of the DNP.

6.6.15 Vegetable and Fruit Market

There are vegetable and fruit market in the city, the vendors throw the waste on the footpath and roads of the market and create unhygienic condition

The DNP may provide large size containers of 400 cubic meters with lid for storage of waste at suitable locations within the market on full cost /partial cost recovery as deemed appropriate. This may be done through PPP mechanism

Picture 6.12 to 6.13 showing encroachment on the main roadside in the town

6.6.16 Street Vendors

Street vendors generate a lot of waste at the roadside eating joints. A drive may be undertaken to educate street vendors and they may be directed not to throw any waste that generate during their activity. Their handcarts must have a shelf or canvas or a portable bin below for storage of waste generated in the course of business. A state level policy draft for street vendors is under process to manage the street vendors' activities in organised way.

6.6.17 Provisions for marriage halls/community halls

Lot of waste is being generated when marriage or social functions are performed at these places and unhygienic conditions are created

Secondary storage and transportation system of the DNP should be provided by these establishments at their cost and the site of their placement should be beard by these establishments or they should pay to the DNP for these facilities for easy collection of waste. DNP may also charge the appropriate waste collection fee for functions being held at such locations

6.6.18 Provisions for Fish/ Meat markets/shops

It is advised that waste from these shops be transported directly from the source with the help of collection vans

Meat and fish market/ shops keepers may be directed that-

They should not throw any waste in front of their shops or anywhere on the streets or open spaces they should keep within their premises sturdy containers (of size not exceeding 100 litres) having lid and proper handling system with adequate spare capacity to handle unforeseen loads

6.6.19 Hospitals /Nursing homes / Health care centre

These establishments may be directed that they should not throw any ordinary solid waste on footpaths, streets or open spaces / nallas

They should keep colour coded bins or bags as per the directions of the govt. of India, Ministry of Environment contained in Bio Medical Waste (Management and Handling) Rules 1998, and follow the directions of CPCB and state PCBs from time to time for the storages of biomedical waste. The storage of bio-medical waste should be done strictly in conformity with directions contained in govt. of India aforesaid notification

DNP along with the department of health should ensure that hospital authorities either set up their own treatment systems or make arrangements to tie up with the common waste treatment facility

Collection of biomedical waste is not in the purview of the municipal authority but later shall collect only the segregated general waste from health care establishments

If any health care establishment is found to mix biomedical waste with general waste being provided to the municipal system may be penalized as per the Biomedical Waste (Management & Handling) Rules 1998

Another container with a lid for storage of food waste and other waste fit to be disposed of into the municipal domestic waste stream shall also be provided by them.

6.20 Provision of Construction and Demolition Waste

Construction and demolition waste is generally deposited just outside the premises on the streets or open spaces causing hindrance to the traffic and adversely affect the aesthetic of the city

To keep the city free from haphazard disposal of debris, directions may be given that no person shall dispose of construction waste or debris on the streets, public spaces, footpath or pavements or in the nallas

Construction waste should not be stored in open spaces or on the roads without prior permission from the DNP the collection should be in such a way so that it could not hamper the traffic, the waste does not spread on the road and does not block the surface drain or storm water drain. DNP may do this through PPP mechanism on cost recovery basis to begin with private party to make a provision of 30 skip containers and 3 skip lifters to introduce this facility in the city.

6.6.21 Garden Waste

Citizens having lawn plots may be directed

Not to throw the yard waste outside their premises.

They should in the first instance attempt home composting in the garden itself or they should enter in to a contractual arrangement with the NP to collect the yard waste

They should store the yard waste in a large jute bags and transfer the same in to a municipal system on a weekly basis on payment

The generation of such waste should as far as practicable be regulated in such a way that it is generated only a day prior to the date of the collection of such waste and should be stored in the premises and kept ready for handling over to the municipal authorities or the agency that may be assigned the work of collection of such waste by the DNP

For removal of garden waste, cluster wise or zone wise arrangements may be made and one vehicle may be allotted to each zone to cover the premise producing garden / yard waste on a weekly basis.

The DNP may contract out this service on full cost recovery basis. The names of the households and commercial establishments having private gardens may be listed in each ward and brought under the contractual arrangement.

6.7 Primary collection of waste from the door step

As per the primary and secondary survey, only about 2-4% population is covered by door to door collection. This door to door collection has been arranged by the households on the cost of their own expenses. At few places a group of rag pickers are collecting waste from the households, and after picking up / selecting the sellable items from the waste rest of the waste has been scattered at the nearby collection point openly in a haphazard manner.

Till the time there is no organized system of door to door collection of waste generated at household and other level in the town. The people are littering the waste at few selected points in the locality as a matter of their convenience and ease of access these collection points creates bad smelling and polluted environment in the vicinity/adjoining areas

The waste stored at the source of waste generation in a segregated manner need to be collected on a day to day basis at pre-informed timings. This is a very important function that municipal authorities must perform effectively to improve the system of solid waste management in the city.

The MSW rules 2000 give the following direction for the primary collection of waste Organize house to house collection of municipal solid waste through any of the methods , like community bin collection (central bin), house to house collection , collection on regular pre-informed timings and scheduling by using bell ringing or musical vehicles (without exceeding permissible noise levels)

Devising collection of waste from slums and squatter areas or locally including hotels restaurants, office complexes and commercial areas

Waste from slaughter house, meat and fish markets, fruit and vegetable markets which are biodegradable in nature, shall be managed to make use of such waste for bio composting

Biomedical waste and industrial waste should not be mixed with municipal solid waste and such waste shall follow the rules separately specified for the purpose

Collected waste from residential and other areas shall be transferred to community bin by hand – driven containerized cart or other smaller vehicle

Horticulture and construction or demolition waste of debris shall be separately collected and disposed off following proper norms. Similarly waste generated at dairies shall be regulated in accordance with state laws

Waste garbage, dry leaves shall not be burnt

Stray animals shall not be allowed around waste storage facility or at any other place in the town and shall be managed in accordance with the state laws

The municipal authority shall notify waste collection schedule and the likely method to be adopted for public benefit in a city or town

It shall be the responsibility of waste generator to avoid littering and ensure delivery of waste in accordance with the collection and segregation system to be notified by the DNP

Picture 6.14 - 6.15 showing the problem of stay animals in the town

To meet the above mandatory directions it is necessary for the DNP to provide a daily service to all household shops and establishments for the collection of putrescible organic / food bio-degradable waste as well as recyclable / non –biodegradable waste from the doorstep. The service must be regular and reliable. Domestic hazardous waste is produced occasionally so such

waste can be collected from the doorstep people on 1 or 2 specified days of the week in separate containers or could be directed to deposit such waste at special domestic hazardous waste collection centre that may be set up in the city by the ULB and be given wider publicity

The following arrangement may be made by the DNP for primary collection of waste

6.7.1 Door to door collection from household

To take initiatives to make the city bin less city the system of direct collection of waste in to transport vehicles may be adopted in few wards doing away with street bins and that area may be designated as “bin less area”. Rest of the ward may have door to door collection through containerized tricycle where waste may be collected from the door step on a day to day basis and deposited in covered containers placed at strategic locations in each ward.

Initiative for the door to door collection through motorized vehicle can be taken from the area having high population density, wards having important roads and commercial streets, having better accessibility of vehicles for door to door collection, major tourist transition areas, and proximity to the treatment plant to enable easy access to avoid large movement of the tipper vehicle.

On the basis of above parameters initially about 500 HHs can be selected for the bin less waste collection and transportation of the waste. Considering that all 500 HHs can be covered by the one motorized vehicle one vehicle is required for door to door collection of waste in the area selected for the bin less area. One spare motorized vehicle can be kept for the door to door collection

Out of the 7 wards the DNP is recommended to make arrangements for door to door collection of waste in rest of the wards through containerized tricycle. The DNP may divide each ward in to units of 125 to 200 houses depending on the density of the houses and access to roads and lanes. An average of 100 households per private waste collector worker is suggested for waste collection

Similarly the commercial streets can be divided in units of 100 to 150 shops and establishments (depending on the size of the establishments)

One part time worker per unit may be assigned for door to door collection of waste every day in the morning between 8 am to 11 am or at any time that may be convenient to the households and 9 am to 12 am in the commercial areas

6.7.2 Method to be adopted for organising door to door collection

Part time workers may be deployed in all the 7 wards by the DNP through RWAs, NGOs or private sector preferably in all the wards by upgrading the rag pickers or engaging the existing private

Sweepers working in several colonies and housing areas. The city is establishing mohalla swachata samitis as per the state provisions, which shall be further, strengthen and involved in the door to door collection of waste

The waste collector should ring the bell announcing his arrival at the place of his work and start collecting the waste from the door step. The people may be directed that on hearing the bell, they should put their domestic biodegradable waste as well as recyclable waste in to the separate compartment of the handcart of the waste collector or hand over the waste to him.

At places where it is not convenient for the householders to deposit the waste in the handcart, on account of their non availability at home when waste collector arrives in their area, they may leave their domestic waste in domestic bins or bags just outside their house on the street in the morning so as to enable the waste collector to pick up the waste and put it in to the handcart

Private sector /NGOs may be involved to provide door to door collection of waste through motorized vehicles in all the 7 wards. Mohalla swachata samitis / private agency /NGO may be allowed to collect user fee charges on the prescribed initial rates which may be increased time to time. DNP shall take strict measure to discourage littering of waste on the streets and motivate households to subscribe door to door collection system

As the town Doiwala is only 22 kms away from the capital city Dehradun therefore with the future expansion of the capital city the Doiwala will also gain momentum in terms of its population and economic growth. The decadal growth of 2.5% also shows the importance of the town. The town has a sugar mill therefore it is an important mandi town and important destination for the farmers of the nearby villages. This shows not a very prominent change in the city permanent population but due to various development activities in and around the city number of daily and monthly

visitors are growing at a considerably rate as a matter of fact about 1500-2000 visitors are visiting the city daily. There is no notified slum under Nagar Panchayat to be taken care of although some weaker section area and group of houses has been identified in the city during the house hold survey of the city.

6.7.3 Need of Manpower and Supervisory Staff

As there is lack of work force with the DNP, therefore there is a need to employ additional staff. This can be done by arranging staff through permanent basis or on contractual basis.

About 60 (at the rate of 2 per 50 HHs) sanitary workers need to be appointed for door to door collection. This can be done by Mohallla swachata samities or by involving private agency / NGOs etc. The cost can be recovered through imposing user charges or service charge on the beneficiaries

6.7.4 User Charges / Service Charges

In lieu of providing door to door collection service following rates can be prescribed from different groups of beneficiaries. By taking a standard size of 5 members per family number of households could be put at about 1650.

Table 6.4 showing Ward wise details of the shops are given in the table

ward No.	Name/location of the ward	No. of Households ward	Total No. of shops	No. of vegetable fruit shops /market	No. of schools & other institutions	No. of banks + Gov.offices	No. of Hospitals / Nursing Homes & veterinary clinics	No. of Hotels & Restaurants
1.	Amedkar Nagar	239	195	1	Nil	1+ 4	2	2
2.	Thana	261	107	Nil	Nil	Nil + 1	Nil	1
3.	Trigharat	368	390	6	Nil	Nil + 1	2	10
4.	Mill Area	154	148	Nil	1	Nil + 1 (sugar mill)	1	5
5.	Ravidas Mandir	201	190	Nil	1	3 + Nil	Nil	Nil
6.	Gyan Vihar	187	19	Nil	Nil	Nil+ Nil	Nil	Nil
7.	Prem Nagar	265	119	1	Nil	Nil + 2	Nil	Nil
	Total	1675	1168	08	2	4+9=13	5	18

If there will be financial support available from GoI and State Government , the CSP can be proven to be a mile stone in achieving the ultimate goal through various objectives. It will not only improve the city sanitation picture but also improve the environmental, health, aesthetics and living quality of the city as a whole.

Table 6.5 showing suggestive monthly user charges from various groups of beneficiaries

S. No.	Beneficiaries category	Cost per unit	Monthly user fee rate
1.	BPL gp HHs	10	10
2.	LIG	10	20
3.	MIG & HIG	10	30
4.	Shops	20	30
5.	Hotels & Restaurant	100	150
6.	schools, Offices & Institutions	50	100
7.	Hospitals & health care clinics etc.	100	150
8.	Factories and workshops	150	200

6.7.5 Legislation/ penalty provision to tackle the Problem of littering of waste

Municipal rules for prohibiting littering of waste openly will be strictly followed with initiation of storage of waste at source in segregated manner. For this wherever possible two separate bins will be provided to the people delivering waste in segregated manner for initial 3-6 months of CSP implementation, private sector, NGOs and other government aided agencies shall be encouraged to provide bins to the households to the extent possible in lieu of advertisement rights in the bins

Although littering of waste in street openly is a punishable offence as per the municipal rules 2003, however about 20-30% waste generated per day can be seen deposited openly either at open spaces or around the bins placed for collection. No door to door collection facility, far distance of

bins location, ignorance etc are the major causes of open littering of waste. This kind of indiscriminate disposal of waste on the streets causes nuisance to the people, clogging of surface drains etc.

6.8 Segregation of recyclable waste

There is no practice being followed for segregation of waste at source by the residents in the city. Only waste is partially segregated to sale it at shops or to kabadiwalas. Rest of the recyclable materials is disposed off by the residents along with the organic waste in the mixed form. Rag pickers collect the waste to earn their livelihood. There are no separate arrangements for collection of construction and demolition waste

6.9 Street sweeping

Total road length of the Town Doiwala is about 12 kms including NH-72 connecting capital city of the state to the nearest airport; Jollygrant. All the roads are swept manually in the town on the daily basis

Street sweeping is carried out in about 60% municipal areas in the morning time between 7:30 am to 9:30 am. About 5-6 sweepers remain engaged in the sweeping activity during the morning time. There is lack of night sweeping practice in the town even on the major streets

As per the primary survey the interior areas of the town is not been swept on daily basis there the frequency of sweeping remains once in 2-3 days.

The city is having total cement concrete road length of about 8 km. The road cleaning condition is moderately good but there are few roads that needs to repair as due to heavy rainfall the road has become rough and creating the problem of water logging even during little rain fall.

The roads are being swept by the sweepers once in a day i.e. in the morning time but there is provision of sweeping the road twice in a day as per the Municipal Rules 2003. The workers have to deploy for this arrangement of street sweeping in the city sanitation plan.

Sanitation workers collects the road and street waste on the roadside from where the waste is being picked up and stored at secondary storage point or to the nearest collector bins. There is lack of work force at present also there is no provision for substitute of workers due to this sweepings does not takes place on holidays.

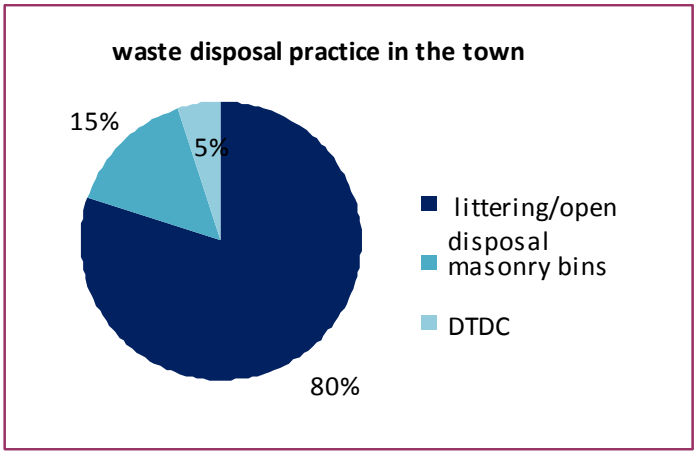
Most of the sweepers used short handled brooms that are not an efficient tool for sweeping on roads. Long handled brooms will be promoted in the town and training will be provided to the

sanitation workers to make them efficient in using the tools to increase the level of sanitation services provided by them.

The no. of vehicles/ tools for workers/ safety measures kit etc is not adequate rendering the workers unable to give their optimum output. There is no synchronization between primary collection and secondary storage of waste. Due to manual handling of waste at depot the workers deposit the waste on the ground instead of directly transferring the waste in to the container this results in unhygienic condition around the container and necessitates multiple handling of waste

Assume one bin per 50 household as a convenience in access / distance of the bins in locality wherever daily door to door collection is not possible.

As per the primary data collected the 30% sampling basis , about 70% waste is thrown openly , 25% in to the masonry bins placed by the NP and only 5% people collects the waste in their house but in mixed form.



Picture 6.16 showing way of waste disposal and collection

Based on the primary survey data analysis about 80% households says that the waste from the collection points and bins are carried out by the municipal sanitary workers but this has not been done on day to day basis. Only about 17% respondents accepted that the bins and collection points are cleared once in 2-3 days while only 3% respondents accepted that the waste is cleared daily these were the areas lying near to the NH-72 and adjacent to the main market area. In 2 wards complains of persistent storage of garbage and foul smelling were registered during the survey.

Wherever door to door collection is being practiced it is by the informal sector as the rag pickers and waste collector they chooses the sellable item from the collected waste and left the residual waste openly in the scattered way therefore ultimately it also add to the open waste disposal in the area. Recently the use of plastic has been banned in the town but its strict implementation is yet to be enforced in the town.

There is lack of synchronization between primary and secondary collection / storage

6.10 Secondary collection of waste

Open waste collection practice shows the lack of awareness about harms of this kind of waste collection among the people in the town. There are about 10 open collection points from where the solid waste is collected.

The containers placed in different wards for the waste collection are of masonry bins types that are not in practice today. During the primary survey about 12 large and small open collection points has been recognised in various locality

There are 3 market areas having about 1170 number of shops in the town. A number of informal kinds of shops and thellas are there in the town. The market waste is collected and disposed in the similar way as of the household waste. Bins are placed at strategic points in the main market areas, where the waste is generally thrown. The road sweepings from the market areas are also deposited in to these bins

As per the primary data collected from the market areas the market waste is collected in the morning time daily, between 7:30 am to 9:30 am. The sweepers collects the waste in the form of piles along the roadside and later on put it in to the bins or been collected by the DNP waste collector vehicle/ cart. As per the Municipal rules the street sweeping must be done twice in a day that is in the morning as well as in the evening but this practice is not being followed in the town in the excuse of having lack of workers with the DNP.

As at present door to door collection is being practiced in 2 wards of the town therefore it is recommended that this can be done with the involvement of the private agency/ NGOs or any other local agency. As a beginning door to door collection practice can be adopted in 1-2 wards for the phased way implementation initially. A demand based survey to assess the willingness to pay for the door to door collection facility can be done and a working strategy can be made to initiate the process of door to door collection.

Analysis of about 750 households in all the 7 wards indicate that majority of the households (70 %) dispose garbage in the open or in open drains or nallas (15-20 %) while only a small proportion of households about 10% practice proper disposal of waste i.e. in to the bins or handing over to the waste collector.

Primary data analysis reveals that proper use of NP bins is being practiced in only 2-3 wards where collectively about 10% of the households are using solid waste bins for proper littering in to these bins.

Majority of the respondents about 90% has complained about the bad smelling problem in the area due to lack of bins and the farther location of the bins. It indicates the less number of bins per ward as per the requirement convenience of the people in the locality

As a standard there must be 1 collector bin at every .5 to 1 km distance if there is no door to door collection service has been provided on day to day basis by the DNP

Majority of the respondents out of the total 750 respondents agreed that the DNP collects the waste from bins but not on day to day basis. Only a very less amount about 5% respondents accepted that the bins are cleared on daily basis

A bulk amount of respondents about 80% agreed that the bins are being cleared once in 2-3 days

NP has given the lack of work force and lack of asset reason behind all this kind of complains regarding solid waste management

6.11 Transportation of wastes

The primary and secondary data analysis reveals that DNP have only one tractor trolley as a vehicle for transportation of municipal waste. This made two trips per day having a carrying capacity of about 1.5 Ton therefore transporting on an average 2.5 – 3.0 MT waste per day rest of the waste is cleared out from time to time. Details of the trips undertaken by the vehicles on a daily basis are as below:

Table: 6.6 Showing the Transportation of MSW: Present Status

S.No.	vehicle	No.	Total No. of Trips/day	App. quantity per trip (Ton)	App. quantity transported per day
1.	**Tractor Trollys**	1	2	~1.5 Ton	About 3 Ton
2.	**Dumper Placers**	Nil	-	-	-

The above analysis and the primary field observation shows poor waste collection efficiency that is only about 60%(about 3 Ton) of the waste generated per day(5 Ton) is being sent to the dumping site while rest of about 40% (2 Ton) of waste remain unattended.

Based on the calculation 5 MT per day waste should be cleared on a daily basis but primary on-site observation seem to indicate that no more than 2-3 MT per day is lifted every day this shows the collection efficiency of only about (60%).

Informal rag pickers were not seen during the primary survey on the roads generally but they can be seen at the collection points in the locality where they collect the things of their interest from the waste and left the rest of the waste in even more haphazard manner on the roadside

The rag pickers / waste collectors , collects plastics , paper , metals , glass etc. from the mixed waste and sell it on the kabadiwala shop to earn their livelihood

Transportation is being done through traditional way. In most of the cases the waste is manually loaded in the trolley / tractor due to lack of synchronization. The waste is collected and handled in a very unhygienic manner from open storage sites and masonry bins collection sites. The transportation work is unscientific and causes nuisance and unsightly appearance. The NP has been using open vehicle for transportation of waste and therefore the compliance of MSW rules 2000 in the matter of transportation of waste on a day to day basis in a covered vehicle is not fulfilled and the transportation efficiency is 60-70% only.


Pictures 6.17-6.18 showing manual handling and transportation of waste in Doiwala

There are only 10 handcarts and 1 tractor trolley with the DNP to collect and transport the waste that is highly insufficient. The transportation work is also not carried out on all the days of the year. Due to lack of work force and inadequacy of vehicle and appropriate management for transportation of waste it is not possible for the DNP to transport the entire quantity of waste generated on a day to day basis.

The waste is handled manually and carried away by the drivers and sanitary helpers employed by the DNP. Daily 2 trips are performed by the tractor trolley for transporting the municipal solid waste. The waste is being dumped on a temporary dumping site near keshavpuri area which is about 3 km away from the city.

The transportation of the MSW from the containers to the dumping site is undertaken with the help of 1 dumper placers and 1 tractor trolley. The drivers of the transport vehicles as well as the transport staff are employed by Doiwala NP. There is no in-house maintenance workshop for the vehicle and breakdowns are quite common and frequent.

6.12 Waste processing

There is no processing of waste generated therefore the entire waste of the city generated found its way to the dumping ground in untreated way.

6.13 Disposal of waste

There is no arrangement of scientific landfill site and the DNP is facing this problem badly due to unavailability of proper disposal landfill / dumping site for the town waste. There is currently no treatment of waste collected. The MSW collected is dumped at a site near to Rajeev Nagar on

Rishikesh road in keshavpuri area which is about 3 km away from the main city. The dumping site measures about 2 acres of area where all the transported city waste is being dumped without any processing

As there is no scientific landfill site therefore the percentage of compliance of the landfill component is zero


Picture 6.19-6.20 showing Keshavpuri dumping site near Doiwala

Table: 6.7 showing the current status of SWM service

Indicator	Norm	DNP
Door to door collection	**100%**	**in 2 wards only**
Extent of segregation of MSW	**100%**	**Nil**
Road length per sweeper	**400-600m**	**700-1000m**
Sweepers per 1000 population	**3**	**1.3**
Adequacy of secondary collection/storage system	**100%**	**70%**
Waste collection performance	**100%**	**60%**
Extent of processing MSW	**100%**	**Nil**
Extent of scientific disposal of MSW	**100%**	**Nil**

6.14 Institutional set up

The details of the Doiwala NP conservancy staff engaged in providing solid waste management services is as follows of the total municipal staff of about 25 about 15 are directly related to the solid waste management operation. As the DNP is facing the problem of having less number of working staff. The NP has hired about 10 temporary staff to provide the MSW collection and transportation services. Additional manpower / workforce is deployed on day to day basis for special occasions

As per the CPCB guidelines the recommended ratio of sanitary staff per thousand of population should be 2.1 for a city of the size of Doiwala. The present ratio in NP Doiwala is 1.3 per 1000 population is very less than the suggested norms.

6.15 Key issues & deficiencies identified

Based on the primary and secondary survey data analysis following major problems has come out regarding the existing sanitation scenario of the town.

- The problem of water logging was found in the few wards where roadside water logging conditions has been registered during the primary survey.

- There is no system of segregation and storage of waste at source a large proportion of the population throws the waste on the streets , drains , water bodies and nallas
- No door to door collection is in practice in the town
- There is no working system of street sweeping twice in a day i.e. in the morning as well as in the evening time as per the municipal rules. Sweeping is being done only once in a day that is in the morning time.
- The existing condition of secondary storage of waste is very unsatisfactory as most of the time the waste is collected and keep on lying unattended at various open places in the town
- Households are responsible for disposing the waste at designated collection points but during the primary survey it was found that at most of the places where DNP has placed the bins, nobody is taking pain to put the garbage in to these bins. Most of the time waste can be seen lying outside the bins even at few places bins were found in neglected and in avoidable situation lying away from the waste.

- No facility of processing of municipal solid waste the entire waste is being dumped at the unscientifically selected small chunk of land being used as a dumping site in keshavpuri area
- Out of the total waste generated per day that is about 5 MT about 55% household waste is biodegradable waste , about 25% waste is recyclable waste and rest of the 20% waste is inert in nature
- The city does not have an engineered landfill site there is no land available with the DNP for future arrangement of waste disposal.
- As an estimate only 40 -50 % municipal waste i.e. 2-3 MT is being cleared by the municipal staff daily.
- There is lack of capacities with the NP official staff as well as lack of trained skills with the sanitary staff of the NP Doiwala to handle the solid waste management technical things.
- No land available for the landfill site
- Problem of open defecation is more prominent near railway line area
- Encroachment on roads by the unorganized market shops and informal sectors
- Problems of stray animals
- Problems of cleaning of choked open drains, nallas in the town due to unattended solid waste disposed in open areas
- Problem of open urination in the town especially in commercial areas
- Problems of lack of waste collector and bins and illegal way of littering of wastes in tot lots, roads and in open residential as well as in the commercial areas
- Lack of segregation of waste at source, irregular, ineffective and efficient primary collection system. A significant part of the waste is left attended
- Lack of community involvement and private participation
- Problems of disposing solid waste in to open areas, streets, in open drain etc.
- Burning of waste causing health and environment hazards
- Manual handling of waste , from collection to the disposal of waste during the process the sanitary workers are exposed to the waste
- No safety measures been provided to workers who are vulnerable to the health hazards.

- Lack of IEC, capacity building and awareness generation activities in the town to educate people on the ill effects of haphazard disposal of solid waste

6.16 Suggestions

- Sanitation workers engaged in loading the waste should be given masks , gloves , jacket , whistle , gloves and rain coats for the protection
- Recruitment of the sanitation workers
- Various IEC campaign and awareness generation activities will be arranged to educate and to motivate the citizens in keeping the city clean. Waste segregation at source, no open defecation and encouragement of bio-composting, no use of polythene etc. will be covered under these campaigns.

- CSP proposes to introduce door to door collection on daily basis as well as daily two times sweeping on the streets.

- All the waste collected from the all secondary storage points is proposed to be transported in covered hydraulic vehicles / containers on day to day basis avoiding poor aesthetic and manual and multiple handling of waste.

- It is proposed to start backyard composting wherever it is possible in the town. For rest of the bio- waste private agency can be involved for bio- composting

- To provide improved quality of tools and equipments and ensuring procurement of good quality equipments
- To provide / availability of storage place / sheds for tools and equipments
- There should be prizes / promotional opportunities for sanitary supervisors to motivate them.
- To provide petrol and recharge payment facility to each supervisor
- Arrangement for a substitute sanitary worker when someone falls sick or remains absent
- The street sweeping should not be given on contract
- Create public awareness through various IEC activities
- Provision of weekly off to supervisors
- Have the provision of spot fine for those who litter

- Arrange door to door collection from each house and levy spot fine if no segregated garbage is given
- Make arrangements for controlling the stray animals
- Separate distribution of works of street sweeping and drain cleaning
- Delegate power to sanitary supervisors to levy spot fines and make challans
- Put a ban on the use of plastic
- Imposition of the fine for those who litter

6.17 Future plans of Doiwala NP for improving SWM

As NP is working towards use of biodegradable waste for the formation of compost therefore as far as will be possible, bio composting unit will be set up on the land lying vacant in the vicinity of the residential areas and colonies as backyard composting. Efforts will be made to encourage the people and residents towards adopting this bio- composting technique at grass root level so that the deduction of the waste at source can be initiated. As there is non availability of large chunk of land for landfill site, efforts will be made to find the small site on clusters basis. It will not only solve the problem of land but also will reduce the cost of transportation to carry the waste to a distant landfill site. Proper attention will be paid in selecting the clusters based site so that it could not disturb and pollute the environment and aesthetics of the nearby areas. Attempts will be made to dispose only inert waste on the land fill site and not the mixed waste.

Cluster based vermi compost plant / EM solution based compost plant will be settled as per the requirement. The recycled kind of waste can be settled out in this way

Extent of Scientific disposal of MSW: There is no scientific disposal of MSW in the city and only unscientific open dumping resorted to the dumping site.

Extent of Cost recovery of SWM Services: The extent of cost recovery is almost negligible as there are no direct fees being collected by NP for SWM services. As there is no operationalization of door-to-door collection and where it is working is being carried out by the private people who are collecting the cost by their own.

6.18 Efficiency Redressal of Customer Complaints:

As per the primary and secondary survey details, there is negligence among the people for complaining as they perceive it as extra burden and as a poor mindset but whenever complain has been made for some serious problem regarding SWM then they are redressed within 2-3 days.

6.19 Requirement of Staff

The present indicators of Sanitary Staff per Thousand population in Doiwala is very less i.e. only .005, If we include the contractual staff assuming they are all involved in the SWM activity, the value goes up to .001, which is still lower than the CPCB norm of 2.1 SWM Staff per Thousand of population. The NP is thus understaffed if the compliance with the MSW management rules is the overall objective.

6.20 Cost sharing for sustenance of CSP

Town Doiwala is a small town of the population of about 10,000 and numbers of households are about 1650 therefore the town can share 5% Cost of the project at initial level but later on this share can reach up to 10% depending upon collection efficiency of the ULB with the 10% sharing of the state government. The total project expenditure can be split in to three major head to maintain the sustainability of the plan in future. As 80% of the estimated cost of the total project can be beard by the central government, 15% of the estimated cost of the project can be shared by the state government and the remaining 5% estimated cost can be shared by the Nagar Panchayat through user charges and other service taxes.

The overall performance of SWM services vis-à-vis the norm is presented in the table

Solid waste generation (2010)

1. **Total waste generation**

Assuming per person waste generation is 350 gm / day then total waste generation is

11850* 350 /1000*1000= 4.1475 tonnes / day

Assuming 30 % extra waste from other institutions

4.1475 * .30 = 1.24425

Total waste = 4.1475+1.24425 = 5.39175 tonnes / day

The total estimated waste generation per day is about 5.39 tonnes

Although as per the secondary data collected from the DNP about 5 tonne waste is generated per day in the town.

2. Door to door collection of waste

To collect the waste from residential areas the tricycles and auto tippers can be used

Number of tricycles and auto tippers required

As one tricycle can collect waste from 200 HHs therefore for thousand HHs

No. Of tricycles required will be 1670/ 200 = about 9

As one auto tipper can collect waste from 1000 HHs therefore **1 auto tipper** will require catering the rest of the population.

If use of hand carts is preferred in the town then no. Of handcarts required will be

One hand cart can collect the waste from 50 houses therefore the no. Of carts will be

1670 No. Of households / 50 = 34

If the frequency of one handcart usage can be made to twice or the no. of HHs to be catered is assumed half of the actual HHs then this number can be reduced to half

34/ 2= 17 hand carts will be required

No. of tricycles required for commercial areas

One tricycle can collect waste from the 200 shops

Total tricycles required = 500 / 200 = 2.5 i.e. 3

For commercial road of about 2 km, about 100 meters road can be served by a litter bin to collect the waste from passer – by therefore

Total no. of the bins required will be = 2000 / 100 = 20

3. Street sweeping

Total road length in the town is about 10 km including the road length of about 2 .5 km of NH-72 . Assuming that one sweeper will sweep 1000 running meter length per day then no. of sweepers required will be

10 * 1000/ 1000= 10

To follow the municipal rules of sweeping twice in a day i.e. in the morning as well as in the evening the total no. of workers required will be twice i.e.

10 * 2 = 20

About 10 % workers can be assumed to appoint at the place of absentees

Therefore total no. of workers required = 20 +2 = 22

4. Number of bins required for secondary collection

For the area where door to door collection is not possible in the beginning community bins of the capacity of the 40 litres will be provided for every 15 HHs. Based on the primary survey assuming total number of such HHs will be 300 then number of bins and handcarts required will be

No of estimated HHs = 300

No. of bins required = 300/ 15 = 20

No. of handcarts required to empty those bins = 2

5. Secondary storage of waste at fixed locations on streets

Assuming 55-60% of the total waste generated to be wet waste, and providing containers of size 4 cum having a storage capacity of 1.5 tonne for wet waste and 40% of the total waste generated to be dry waste and providing containers of size 2 cum having a storage capacity of 0.8 tonne for dry waste

Then amount of wet waste will be = 5 * 60/100=3 Tonne

No. of containers required= 3 / 1.5 = 2

Total no. of containers required of the size of 4 cum = 2 + 2 (extra for replacement) = 4

Amount of dry waste will be = 5 * 40/100 = 2 Tonne

No. of containers required = 2/ .8 = 2.5 i.e. 3

Total no. of containers required of the size of 2 cum = 3 + 2 (extra for replacement) =5

6. Transportation of waste from secondary storage points to the landfill site

Two tractors will be deployed for the collection of waste from above containers as well as bulk generators and other sources as per the requirements

No. of tractors required = 2

7. Number of staff required

Present conservancy staff = 15 (5 permanent + 10 contractual)

As per norms requirement is of about = 40

Table 6.8 showing Financial Statement for scientific disposal of solid waste/ land fill site in DNP

S. no.	Present mode of transport	Total Area	Available at DNP	Require ment	Rate	Unit	Amount(in Rs.)
1	Near NH-72 village Keshavpuri	0.2 Hect.	1	1	-	-	-
2	Construction of Treatment Plant for degradable and none Degradable waste for scientific disposal of waste	600.00 Sqm	-	2	7550.00		4530000.00
3	Construction of wire fencing and boundary wall and plantation near side of Damping point	200.00	-		3000.00	No	600000.00
4	Construction of approach road for approaching up to dumping point including supply of all labour T & P for proper completion of work as per P.W.D. specification of work	400.00	*	*	2000.00	Rm	800000.00
						Total Rs	**5930000.00**
	Provision of contingency T & P. 10 % of above item						593000.00
						Grand Total say Rs	**6523000.00 65.23 Lacs**

Table: 6.9 showing the current status of SWM service

Indicators	Norms	DNP
Door to door collection	100%	In 2 wards
Extend of segregation of MSW	100%	Nil
Road length as per sweeper	400-600Mtr	750-1000mtr
sweeper per 1000 population	3	About 2
Adequacy of secondary collection/storage system	100%	Nil
Waste collection performance	100%	60%
Extend of processing MSW	100%	20%
Extend of scientific disposal of MSW	100%	Nil

Table: 6.10 Showing the Transportation of MSW: Present Status

S.N	Vehicle	No.	Total no. of trips per day	Approx qty per trip	Approx qty transported per day
1	Tractor Trolley	1	2	About 1.5 Ton	About 3.5 Ton

Table: 6.11 shown details of staffing for public health and conservancy

S.N.	Head	AS per CHPHEEO	DN P status
1.	Total No. sanitary sweeper/ worker (Regular & Temp)	30	15
2	Sanitary supervisors	3	1(temporary)
3	Sanitary inspector	2	Nil
4	Sanitary officer	1	Nil
5	Public health engg. / engg. inc.	1	Nil

Table: 6.12 showing the current operation and maintenance expenditure

S.N.	Details	Amount in Rs 000.00
1.	SWM Permanent staff+ Temporary staff	1300000.00
4	Fuel	100000.00
5	Repairs	50000.00
6	Consumables	300000.00
	Totals	**1750000.00**
	Say Rs	**17.5 Lacs**

Table 6.13 showing estimates for next 5 years.

S.N.	Particulars	Cost of work			
		Unit	Qty	Rates	Amount
1	Construction of 40 one/two seated toilet in different places for tourist and daily commuters in different wards of DNP including sewerage connection and water connection.	No.	40	65000.00	2600000.00.00
	Contingency T& P 10%				26000.00
				Grand Total	2626000.00
				Say Rs	**26.30 Lacs**

Table 6.14 showing financial estimates for the vehicle requirement for solid waste management

s. no.	Present mode of transport	Total SW disposal	Available at DNP	Unit Required	Rate	Amount
1	TATA ACE having capacity 0.250ton	6.00 Tone	0	2	300000.00	600000.00
2	Tractor With Trolley		-	2	500000.00	1000000.00
3	Sewer cleaning Vehicle/ name of vehicle		-	1	1000000.00	1000000.00
4	J C B(small) for filling of waste Garbage		-	1	2000000.00	1000000.00
					Total Rs	**4600000.00**
					Say Rs	**46.00 Lacs**

Table: 6.15 financial estimates for the solid waste management

S.N.	Activity	Particulars of item	Demand as per nouns	Available	Present demand	Unit	Rate	Amount
1	DTDC	Tricycle	5	2	3	No.	7500.00	22500.00
2		Auto Tippers	6	-	6		100000.00	600000.00
3		Hand cards with containers	16	4	12		4500.00	54000.00
4	DTDC commercial are	Tricycle	3		3		7500.00	22500.00
5	Secondary store	waste containers (4 cum)	4	--	4		21000.00	84000.00
6	Dry waste	containers (2 cum)	5	-	5		1500.00	75000.00
7	Commercial area	Litter bins	50	10	40		500.00	20000.00
8	Non approachable area	Community bins	20	5	15		500.00	7500.00
9	container placement	Platform	2	-	2		25000.00	50000.00
10	Street Sweeping	Hand cards	4	-	4		4500.00	18000.00
11		Brooms	200		200		75	15000.00
12		Jacket, Gloves	50				250	50000.00
13		book Kit	50				50	2250.0
14		other instrument	L.S.				10000.00	10000.00
							Total Rs	**1030750.00**
							Say Rs	**10.30 Lacs**

6.21 Crematoria

As the two religious places, Haridwar and Rishikesh are near to the town of Doiwala therefore most of the people prefer to perform this ritual in these towns. Few cases of cremation are performed on the bank of river song that is about 2.5 km away from the municipal limit area although number of cremations is not very high but in future this number is likely to go up with the increase in population likewise there can be a future demand of a scientific solution of the problem. The burial ritual is being practiced in a village near to the town that is about 3 km away from the town as the burial ground space is not available under municipal limit area of the town.

6.22 Dairies

There is no big dairies in the town although there are 1 or 2 cattle in few houses and the amount of excreta generated from this number of cattle is not very huge in quantity and is being used as bio manure in the house plantation therefore dairies are not a big problem in the town.

6.23 Dhobi Ghat

Doiwala is a very small town having about 2.91 sq. km area and have very small streams under the municipal limits for irrigation purpose therefore presently there is no dhobi ghat working in the town.

6.24 Motor Garages

There are 4 motor garages in the town out of this four, two are on Rishikesh road and other two are on Dehradun road. As the city is not industrial in nature therefore the load of vehicular washing and consumption of water for washing is not very big in the town.

Annexure:

Pictures showing meeting held with the surveyors in NP Doiwala.

Picture showing Nukkad Natak in school under IEC activities.

सिटी सैनिटेशन प्लान डोईवाला में सबसे आगे

केंद्र द्वारा मसूरी, मुनिकीरेती एवं डोईवाला को मिली थी स्वीकृति

डोईवाला। उत्तराखण्ड सरकार द्वारा केंद्र से मिली सैनिटेशन प्लान उत्तराखण्ड में लागू करने की लिए जो मांग की गयी थी वह मांग केंद्र ने स्वीकृत कर दी थी। उत्तराखण्ड में मात्र तीन निकायों को इसे लागू किया गया। इसी को देखते हुए सर्वप्रथम डोईवाला नगर पंचायत ने सर्वप्रथम इस प्लान को अपने यहां लागू किया। उत्तराखण्ड में तीन नगर पंचायतों मुनिकीरेती, मसूरी एवं डोईवाला में डोईवाला नगर पंचायत इसे लागू करने में जन जागरण अभियान चलाया और एक नगर के प्रमुख सार्वजनिक स्थलों को एक क्रम में लेकर दूसरक फोर्स की कमेटी का गठन किया। इसके द्वारा डोईवाला नगर को स्वच्छ व साफ रखने के लिए यह दूसरक फोर्स कार्य करेगी।

डोईवाला नगर पंचायत की अध्यक्ष श्रीमती प्रेमलता रावत एवं अधिशासी अधिकारी सरिता रावत के प्रयासों से यह काम संभव हो सका। डोईवाला में किस प्रकार से सिटी सैनिटेशन प्लान में सक्रियता दिखायी दे रही है उससे ऐसा लगता है कि आने वाले समय में डोईवाला नगर पंचायत को एक अलग ही तस्वीर उभरा के सामने आयेगी।

सफाई व्यवस्था पर विशेष रूप से ध्यान दिया जा रहा है। जिससे भी डोईवाला में कार्य है सभी में कार्य प्रणालिकता से पाल रहा है। सफाई व्यवस्था का विशेष तौर से ध्यान दिया जा रहा है। क्योंकि कुछ लोगों कई बिमारियां आस पास फाई खड़ी है। नगर पंचायत के द्वारा जगह-जगह दवाईयां डाली जा रही हैं जिससे किसी प्रकार की बिमारी डोईवाला नगर पंचायत में न फैल सके।

डोईवाला नगर पंचायत की अध्यक्ष एवं अधिशासी अधिकारी सरिता रावत का कहना है कि यह प्लान तभी कामयाब होगा जब डोईवाला क्षेत्र की जनता उन्हें सहयोग करेगी।

इसी प्रकार से क्षेत्र को स्व नगर पंचायत का सहयोग कर रही तो जल्द ही नगर पंचायत डोईवाला को गंदगी मुक्त कर देंगे जनता।

" उत्तराखण्ड सिटी सैनिटेशन प्लान लागू करने में डोईवाला नगर पंचायत प्रथम स्थान पर है जिसका सीधा श्रेय डोईवाला नगर पंचायत की अध्यक्ष श्रीमती प्रेमलता रावत एवं अधिशासी अधिकारी सरिता रावत को जाता है।

सिटी सैनिटेशन प्लान पर टास्क कमेटी ने बैठक कर की चरचा

नगर को स्वच्छ रखने का संकल्प

अमर उजाला ब्यूरो

डोईवाला। नगर को सफाई के लिए जागरूकता अभियान के लिए लागू सिटी सैनिटेशन प्लान के अंतर्गत गठित टास्क फोर्स कमेटी की बैठक में नगर को स्वच्छ रखने पर विचार किया। वक्ताओं ने कहा योजना का क्रियान्वयन बेहतर ढंग से हो इसके लिए ठोस पहल की जरूरत है।

बुधवार को नगर पंचायत सभागार में केंद्रीय शहरी विकास विभाग के सफाई जागरूकता के बैठक में संदीप शर्मा ने योजना की विस्तृत जानकारी दी। कहा जनसहयोग से ही नगर को स्वच्छ रखा जा सकता है। रवीश

अधिशासी अधिकारी से सफाई की मांग

डोईवाला (ब्यूरो)। नगर के घाट रोड पर फैले गोबर की समस्या से निजात दिलाने की मांग क्षेत्रवासियों ने की है। वीरेंद्र सिंह ने अधिशासी अधिकारी को ज्ञापन देकर बताया कि इससे दिक्कत आ रही है। उन्होंने समस्या का समाधान का अनुरोध किया है। बताया कि गंदगी से यहां के लोग परेशान हैं और इसके अलावा बाहर से आने वाले यात्री भी इस समस्या से दो चार होते रह रहे हैं।

कमेटी ने बताया कि राज्य के शहरी निकाय मसूरी, मुनिकीरेती, और डोईवाला में योजना को लागू किया गया है। नगर पंचायत अध्यक्ष प्रेमलता रावत ने कहा यदि सीवर लाइन और ड्रैनेज ढांचे की व्यवस्था हो जाए तो प्लान जल्द सफल हो जाएगा। अधिशासी अधिकारी सरिता रावत ने भी विचार रखे।

बैठक में महेश रावत, आशा कोठारी, मुकेश अग्रवाल, शेखर मनराई, मीना देवी, अनिल चौहान, राजेंद्र वर्मा, अंपी बडोनी, शेखर बिष्ट, राजीव मौजूद थे।

Picture showing prize distribution for various competitions held on sanitation themes in schools and colleges.

Picture showing sanitation awareness generation rallies held in the town.

स्वच्छता से क्षेत्र को मिलेगी नई पहचान: रावत

डोईवाला (प्रभात)। नगर पंचायत प्रशासन द्वारा राष्ट्रीय नगरीय स्वच्छता नीति के अन्तर्गत सिटी सेनिटेशन प्लान के क्रियान्वयन के लिए विचार गोष्ठी का आयोजन किया गया। जिसमें छात्रों ने भाग लेकर अभियान की सफलता के लिए विचार रखे।

नगर पंचायत सभागार में आयोजित गोष्ठी का उद्घाटन पंचायत अध्यक्ष प्रेमलता रावत ने किया। उन्होंने कार्यक्रम को संबोधित करते हुए कहा कि सिटी सेनिटेशन टास्क फोर्स के माध्यम से क्षेत्र को स्वच्छता से जोड़े रखने के लिए कार्य किए जा रहे हैं। नगर पंचायत प्रशासन द्वारा चलाया गया अभियान स्थानीय जनता के सहयोग से ही सफल हो सकेगा। उन्होंने कहा कि सफाई हमारा क्षेत्र कई बीमारियों से भी दूर रहेगा। उन्होंने नगर पंचायत क्षेत्र में रह रहे हर व्यक्ति को जागरूक होकर सहयोग की अपील की। उन्होंने कहा कि चलाए गए अभियान की सफलता से नगर को नई पहचान मिलेगी। गोष्ठी में [illegible] इंटर कॉलेज एवं पब्लिक इंटर कॉलेज के छात्रों ने भाग लेकर विचार रखे। इस अवसर पर सभासद [illegible], [illegible] तिवारी, अनित चौहान, मीना आर्य, महेन्द्र सिंह राणा, प्रियंका, अश्वनी, रमेश आदि उपस्थित थे।

हिन्दी साप्ताहिक दून विशाल टाइम्स डोईवाला, देहरादून शुक्रवार 10 दिसम्बर 2010 पृष्ठ 4

नगर पंचायत डोईवाला के समस्त सम्मानित नागरिकों को मेरा नमस्कार!!

प्रेमलता रावत
अध्यक्ष
नगर पंचायत, डोईवाला

सरिता राणा
अधिशासी अधिकारी
नगर पंचायत, डोईवाला

शहीद स्थल पर होगा लाइब्रेरी का निर्माण

नुक्कड़ नाटक से स्वच्छता के प्रति किया जागरूक

नुक्कड़ नाटक प्रस्तुत करते कलाकार। छाया: प्रभात।

डोईवाला(प्रभात)। नगर पंचायत डोईवाला में सिटी सेनिटेशन प्लान को प्रभावी रुप से लागू करने के उद्देश्य से नुक्कड़ नाटक का आयोजन कर नगरवासियों को स्वच्छता के प्रति जागरूक किया गया।

नगर पंचायत डोईवाला सभागार में राष्ट्रीय नगरीय स्वच्छता निति के अन्तर्गत बैठक का आयोजन हुआ जिसमें उपस्थित नगरवासियों ने नगर की स्वच्छता से जोड़ने के लिए अपने-अपने विचार व्यक्त किये। इस अवसर पर शहरी विकास विभाग की वन्दना शर्मा ने पॉलीथिन के दुष्प्रभावों, जैविक, अजैविक कूड़े से फैलने वाली बीमारियों से बचाव के लिए जानकारी दी। उन्होंने कहा कि शहर को स्वच्छ बनाए रखने के लिए हर व्यक्ति का जागरूक होना आवश्यक है। कार्यक्रम की अध्यक्षता करते हुए पंचायत अध्यक्ष प्रेमलता रावत ने कहा कि अभियान को सफल बनाने के लिए सभी के सहयोग की आवश्यकता है उन्होंने कहा कि नगर में स्वच्छता बनाने के लिए पंचायत वार्ड स्तर पर अभियान चलाकर जनता को जागरूक करने का कार्य करेगी। इसके पश्चात् आर्यकन्या इंटर कालेज में नाट्य कला सोसायटी देहरादून द्वारा नुक्कड़ नाटक के माध्यम से नगर वासियों को जागरूकता के प्रति प्रेरित किया गया। कार्यक्रम में अधिशासी अधिकारी सरिता राणा, पूर्व नगर पंचायत अध्यक्ष महेश रावत, प्रधानाचार्य निर्मला शर्मा, सभासद बाला देवी, राजेश सिंकरी, रोशन सिंह, कुलदीप, कंचन गुप्ता, मोहित उपाध्याय आदि उपस्थित थे।

भागवत कथा

देहरादून, 20 नवंबर 2010 दैनिक जागरण। 11

सिटी सेनिटेशन प्लान लागू करने को मंथन

डोईवाला, जागरण कार्यालय : डोईवाला नगर पंचायत की बैठक में सिटी सेनिटेशन प्लान को लागू करने के उद्देश्य से विचार मंथन किया गया। आर्य इंटर कॉलेज डोईवाला में हंसा नृत्य नाट्य कला सोसायटी के कलाकारों ने जन जागरूकता पर नुक्कड़ नाटक प्रस्तुत किया।

नगर पंचायत सभागार में आयोजित बैठक में राष्ट्रीय नगरीय स्वच्छता नीति 2008 के अंतर्गत सिटी सेनिटेशन प्लान के विषय में जानकारी दी गई। शहरी विकास विभाग की वंदना शर्मा ने कहा कि सरकार की योजना है कि नगर निकाय स्वच्छता पर विशेष ध्यान दें। इसके लिए वार्ड स्तर पर समितियों का गठन व क्रियान्वयन किया जाए। नगर पंचायत अध्यक्ष प्रेमलता रावत ने कहा कि कई बीमारियां स्वच्छता की कमी के चलते पैदा हो रही हैं। पूर्व नगर पंचायत अध्यक्ष महेश रावत व आर्य कन्या इंटर कॉलेज की प्रधानाचार्य श्रीमती निर्मला शर्मा ने भी विचार व्यक्त किए।

के हस्ताक्षर हैं। 07-oct-10 Thursday.

बैठक में चर्चा

डोईवाला। नगर पंचायत में सिटी सेनिटेशन प्लान को लेकर एक बैठक हुई। इसमें टास्क फोर्स गठन व डाटा विश्लेषण का कार्य पर चर्चा की गई। बैठक की अध्यक्षता करते हुए नगर पंचायत अध्यक्ष प्रेमलता रावत ने कहा कि यह कार्यक्रम जनसहयोग से ही संभव है। बैठक में अधिशासी अधिकारी सरिता राणा, बाला देवी, तरुणा शिंकारी, बिमला देवी, अनिल चौहान, गोवर्धन ममगाई मौजूद थे।