SWACHH BHARAT MISSION

TERMS OF REFERENCE
For
EMPANELMENT OF STATE LEVEL CONSULTANTS

1. Project Background & Objectives

Background

The implementation of Swachh Bharat Mission (Gramin) Initiated from 2nd October 2014, it is pertinent that the most important objective of Swachh Bharat Mission is achievement and sustainability of Open Defecation Free (ODF) status and mannage solid and liquid waste mannagement safely. The Mission shall aim to saturate, on priority, the State/ Districts/ GPs in river basins of Ganga. This will ensure the outcomes required for pollution free rivers, in addition to ODF communities. For the purpose of reducing pollution in river Ganga and securing the river, Nammee Gange program is being implemented as an ambitious program and major project under the National Ganga River Basin Authority. The guiding principles of this project are to adopt a decentralized service delivery system, strengthen institutions for enhancing their capacities, follow a district-wide approach, encourage enhanced community participation and contributions, enhance engagement of the private sector, and promote transparent and accountable processes with robust grievance redressed mechanisms at all levels.

Objectives

The Project objective for the SLWM component of the overall project is to develop year round completely sanitized environment in the village by treating the Solid and Liquid waste generated thereby sustainably improving the health of citizens and animals owned by them. In order to achieve this, the Solid and Liquid waste management plan and DPR using PRA method has to be carried out and implemented.

Initially, It is proposed to develop SLWM Plan of 126 GPs in the 25 Ganga districts(5 gram panchayats each districts and 10 Ganga gram declared GPs). In view of Integrated approach these Gram Panchayats will have safe disposal of Solid & Liquid Waste in SLWM component.

The Specific objective of this assignment is:

"Empanelment of Agency/Individual in different thematic areas to prepare DPR, impart training and Implementation support to the project staff, community based institutions as well as community cadres on SLWM through Integrated Approach, Institution Building, and Vision Building.

2. Eligibility and Method of selection of consultant

Eligibility-

The consultants shall fulfill following eligibility criteria
i) He/ She must have experience in preparing SLWM DPR through PRA (Participatory Rural Appraisal) process, proper experience certificate and references from different clients to be attached with Proposal .
ii) He/ She shall have knowledge of planning and preparing such projects.
iii) The Consultant must have sufficient staff to carry out the project.
The consultant will be report to Mission director SBM (G)

Method of selection-

the consultant will be identified by the Mission Directorate based on the track record of National standing experience, previous work and involvement of the concerned institutions/organizations in rural sanitation sector. The Consultant will be selected for a period of three years. The lead resource person of the consultant should be an individual having sufficient experience of training in participatory approaches and IEC activities related to sanitation sector . The empaneled consultant will have to apply for a renewal of empanelment after the completion of each year. The selection will on the basis of presentation before a committee chaired by Mission Director .

Terms of contract –

This is a contract between consultant and mission directorate based on job basis as and when required. Mission Director will decide district/block /GP for the job assignment and accordingly consultant will deploy his resources to complete the job.

Consultant shall quote rates for activities to be performed :-

1) DPR Preparation per GP basis (fixed).
2) Training and capacity building per day basis for district resource pool.

3) Implementation support per Gram Panchayat Basis (fixed) .

Taxes/Duties/Levies will be as applicable over and above the quoted rates

Interested organization/Individuals will submit technical proposal first and after shortlisting shortlisted organization will be asked to submit their financial proposal .

3. Issues and problem areas

The villages face visible signs of insanitation like open defecation, the liquid waste from the houses and hand pumps stagnate and create pools of water, the composting, dung cake from animal excreta is carried out in open by the side of the roads, the solid waste, is thrown out of the house on the road, the waste water and animal waste find way to nearest pond which spoils the water quality there and create insanitary conditions leading to health problems. The problem of open defecation is being addressed through SBM(G) as integrated component of this project; the issue of solid and liquid waste management is to be addressed.

The parts of the project area also have high ground water and flooding problems which are to be considered while developing the project. There are also the issues of animal waste to be treated mostly on Individual household level.

4. Scope of preparation of DPR

Data collection and DPR shall be prepared on the basis of formats prescribed and attached here with as Annexure - I with this ToR.

All DPR preparation, Training and Implementation support shall be as per the Technical Manual (can be viewed on website – www.mdws.gov.in) issued by Ministry of Drinking Water and Sanitation, GOI.

a. Drawings

The following drawings shall be attached with the DPR .

- Village base map showing all the assets including houses, roads, water bodies, the locations where road side drains exist, the areas along the road that are used for animal waste composting or dung cake housing, the existing solid waste dumping place, proposed places of solid waste processing plant, liquid waste treatment plant etc. Houses where leach pits, compost pits or biogas are to be provided shown in different color. The proposed open drains / piped drains shall be shown.

- If a open drain system is proposed then proposed drains shall be shown on plan with clear direction of flow.
- In case of open drain system, the cross sections of the different sizes of drains shall be shown.
- Drawing for different capacity biogas plant shall be included.
- Drawing for the compost pit meant for the animal waste from 2, 3 and 4 large animals and anything additional shall be attached.
- If any common leach pit is provided the drawing of the same shall be given. Similarly the drawing for the leach pits meant for the small and large families shall be given.

b. Cost Estimates

Cost estimates shall be based on the bill of quantities derived from the good for construction drawings coming out of the detail engineering design. The rates shall be adopted from Schedule of Rates of the PWD/RES UP. The bought out non SR items shall be based on the market rates substantiated by the quotations. The detailed specification for procurement of such items shall be given. the total cost of the work can be met from SBM, SBM(G), 14th finance commission , state finance commission and MNREGA .

c. Institutional Structure for O&M

The suggested institutional requirement for operation of facilities created be given. It can be DSC or Gram panchayat or the community itself. It can also be a private operator or a self-help group. Any strong local institution ready to operate and acceptable to community and DSC can come out as feasible option with consensus. Even the users' co-operative society for the end product may also operate the facility.

d. O&M costing and suggestion for user charges

A detailed requirement of O&M shall be spelt out in the DPR for the solid and liquid waste management. It shall include the operation staff, electricity, chemicals, tools and plants, fuel, repair and maintenance, quality testing charges, etc.

The user charges for each household shall be found out for meeting out the O&M expenses after adjusting the revenue from resource recovered.

e. Inclusion in DPR of the data gathered in the process

The data gathered in the process on the basis of which the project is designed shall be included as annexures in DPR. These may be like baseline data of village, demographic details, documentation of PRA activity, minutes of meetings with village and village resolution to accept the program, quotations taken for non SR items, IEC Plan etc.

f. Submission of DPR and selected Technologies to GP/ DSC

The DPR shall be presented to GP / DSC, explaining the detail components and costs. The details of O&M requirements, the operating cost and user charges required to be levied shall be explained. The consultant will provide 3 sets of final DPR along with Soft copies .

g. Training Programs

- Study materials like training modules, operational manuals and guidelines, communication and IEC materials available with SBM(G) is to be referred and accordingly suitable methodology and approaches to be adopted for delivering training
- Participate in ToTs organized by the project as district and block level on respective thematic areas.
- Facilitate training sessions for all kinds of stakeholders like project staff, community institutions and community cadres as per the requirement.

5. Data & Facilities to be provided by the SBM(G) State Cell.

The Technical consultant , and the Social development expert from SBM(G) SBM(G) Cell and the district officers assigned by SBM(G) State Cell will supervise the assignment and facilitate interactions and exchange of information between UP Panchayati raj department and other Govt. Departments. The project document / study reports/ list of GP's etc. will be made available to the consultants for the assignment wherever necessary.

6. Essential Qualification And Work Experience

The Consultant/Agency should have experience in planning, design, implementation and construction Quality Monitoring of Sanitation works and the solid waste management works.

- Must have sound understanding on the structure and management of different community level institutions,
- Must have adequate work experience in his/her specific thematic area.

- Must have delivered training as a trainer on the specified training area.
- Possess strong inter-personal communication skill.
- Has proficiency in Hindi & English language.

Specific Qualifications for Individual :

- Graduate in any discipline
- At least 10 years of experience as a trainer at state / national level.
- As a trainer must have facilitated training/ToTs in Govt. or externally aided projects or for NGOs of national & international repute.

List of Annexure

Annexure I : Prescribed Format for Data Collection and DPR Preparation.

Annexure II: List of districts: (Allahabad, Badaun, Chandauli, Ghazipur, Ballia, Hardoi, Kannuj, Mirzapur, Raobarreilly, Unnao, Farrukhabad, Amroha, Bijnor, Bulandshar, Fatehpur, Hapur, Kanpur nagar, Kasganj, Kaushambi, Meerut, Muzzafernagar, Pratapgarh, Bhadoi, Saharanpur, Varanasi) taking five gram panchayats from each districts and 10 Ganga gram declared GPs (Disdtrict Bulandshar – GPs Bachhikheda and Siraura, District Hapur – Pooth, District Allahabad – Laksagrih , kakra Uperhar and Singraur,) (total 126 GPs).

Annexure - I

SOLID WASTE DATA COLLECTION FORMAT FOR SWM

Village:	
District:	

a. **PRESENT SCENARIO OF SOLID WASTE MANAGEMENT**
b. **Storage of waste at source**

1	Whether households, shops and establishments Keep domestic, trade, institutional bins at the Source of waste generation for storage of waste? (Yes/No)	
2	If yes; give some details	
3	Whether households feed food waste to their cattle? (Yes/No)	
4	What % of households throw food waste on streets, open spaces, etc.? (%)	
5	What % of households sell their dry waste such as paper, plastic, bottles etc. to Kabaadiwala? (%)	
6	What % of households throw their dry waste on the streets/naali etc.? (%)	
7	Whether there is a system of segregation of recyclable waste at source? (Yes/No)	
8	If yes, What percentage of households/ shops/ establishments keep separate bins for storage of bio degradable (wet food waste) and dry non biodegradable (recyclable) waste at source? (%)	

c. **Primary collection of waste**

1	Has panchayat introduced any system of door to door collection for·	
a)	Food waste (Yes/No)	
b)	Recyclable waste (Yes/No)	
c)	Mixed waste from households, shops and establishments (Yes/No)	
2	If yes, give details	
3	Whether any private sector/ NGO is involved in solid waste collection (Yes/No)	
4	Mention the system of waste collection adopted in the Panchayat for collection of bio-medical waste, construction waste? Attach sheet if needed.	

d. **Managing animal dung**

1	How many households keep animals at home? (Number)	
2	How many animal dung storage sites are on in public places or the road side? (number of non-household sites)	
3	How many animal dung storage sites are in private places? (number of household sites)	
4	What % of animal dung is used for making fuel cakes? (%)	
5	What % of animal dung is used as manure? (%)	
6	At what frequency animal dung stored at public sites is transported to the farm lands? (Number of months)	

e. **Street sweeping**

f. **Give list of roads/in the village that need to be cleaned by panchayat in the following table:**

Name of the Road/	Ward	Length (L)	Road length swept by residents (L2)	Road length to be swept by panchayat (L-L2)

g. **Status of cleaning the streets by panchayat sweepers (mention % of streets that get cleaned up):**

Daily	Alternate day	Twice a week	Once a week	Occasionally

iii	No of hand carts/ tricycles/ etc. for sweeping with the Panchayat (Number)	
e	**Storage of Recyclable Waste at the Village Level:** Has the panchayat constructed a shed for storage of dry recyclable waste such as paper, plastic, metal, glass etc.? (Yes/No)	
i	If yes, give the size of the shed constructed? Length x Breadth x Height (in Meters)	
ii	Give details of how dry waste is given away/sold to recycler	

f. **Transportation of Waste**

i. Number, type and age of vehicles utilized for transportation of waste

	Type of Vehicle	Number	Age (in years)
1			
2			
3			
4			
5			

ii.	Number of trips made by each type of vehicle in one shift (8 Hours)		Trips
iii	Quantity of waste transported each day·		Kg

g. Processing of Waste

i	Whether any processing of solid waste is being done at home, community or at village level? (Such as vermi-composting/microbial composting / Bio-Methanation/bio-gas)? (Yes/No)	
a)	If yes, give details:	
ii	Quantity of waste treated each day (Kg.)	
iii	Technology/ technologies adopted	
iv	Area of the processing site/shed.(in sq/m)	
v	Whether private sector/NGO is involved in this activity?	
a)	If yes, give details·	

h. Disposal of Waste

i Whether any solid waste disposal sites (dumpsite)/pits is available with the panchayat. Give details as under:

Sl. No.	location of dump site/pit	distance from the village boundary	area in sq.mt/acres	Distance from habitation, water body, historical monument, and imp. Religious place (if within 1 km)	Since when in use? (Months)
1					
2					
3					

ii	Whether the waste deposited of at the dumpsite is spread on day to day basis? (Yes/No)	
iii	Whether the waste deposited of at the dumpsite is covered with inert material on day to day basis? (Yes/No)	

i. Disposal of Dead Animals

i	How does panchayat dispose dead animals?
ii	Whether private sector/NGO/ contractor is involved in this activity? If yes, give details

FIELD SURVEY TO BE CARRIED OUT

Meetings with Sarpanch, other key Panchayat members and Key informants like teacher etc, would help the surveyor draw up a distribution of households in the GP by economic standing (3 categories high, middle and low income households) and determine the proportion of households in each

Table 1: Distribution of Households

Economic Category	Number of Households
High Income Households	
Middle Income Households	
Low Income Households	
Total	

The surveyor may now select 10 households from high income, middle income and low income households (Total 30 households) for undertaking detailed survey as per table 1 & 2 below:

For estimation of solid Waste generated at household (Table 2A, 2B. . .)

Distribute 1 waste storage bag to each household selected and request the household to store all their bio-degradable (food waste) and non bio-degradable(dry waste such as paper, plastic, bottles) etc they generate in 24 hours in the bag and give it to the waste to the surveyor the next day Weigh the waste collected from each household and keep a records per the format in the Table 2A

Similarly draw 10% samples from commercial establishments and assess the quantity of waste generated by each category of waste generated as indicated above

Table 2A: Estimates of Quantity of Solid Waste in Sample of Households

Household Number	Name of Head of Household	Number of members (N1)	Number of Cattle (C1)	Weight of solid waste generated per day (Grams)			Weight of Dung generated per Day (kg.)		
				Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
High Income									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
Middle Income									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
Low Income									

Household Number	Name of Head of Household	Number of members (N1)	Number of Cattle (C1)	Weight of solid waste generated per day (Grams)			Weight of Dung generated per Day (kg.)		
				Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Table 3A : Estimates of Components of Solid Waste in Sample of Households :

Waste Composition: Waste collected from group of 10 households from each category (high income, middle income and low income category) should be mixed and thereafter bio-degradable (food waste), recyclable (paper, plastic, metal, glass) and inserts (ash, dust) are separated and weighed Record the waste component generated by each category of household as under:

Table 3A.1 (Day 1)

Category Total (for all samples)	Food Waste (Gram)	Paper (Gram)	Plastic (Gram)	Metal (Gram)	Glass (Gram)	Inserts (street sweepings, ash) (Gram)	Animal Waste (kg)
High Income Households							
Middle Income Households							
Low Income Households							

Table 3A.2 (Day 2)

Category Total (for all samples)	Food Waste (Gram)	Paper (Gram)	Plastic (Gram)	Metal (Gram)	Glass (Gram)	Inserts (street sweepings, ash) (Gram)	Animal Waste (kg)
High Income Households							
Middle Income Households							
Low Income Households							

Table 3A.3 (Day 3)

Category Total (for all samples)	Food Waste (Gram)	Paper (Gram)	Plastic (Gram)	Metal (Gram)	Glass (Gram)	Inserts (street sweepings, ash) (Gram)	Animal Waste (kg)
High Income Households							
Middle Income Households							
Low Income Households							

Table 3A. Average (Day 1+2+3)

Calculate the average value for each cell by averaging the values in that cell for day 1, 2 and 3 For example, add the values in the Food waste- High income cell for day 1, day 2 and day 3 and divide by 3.

Category Total (for all samples)	Food Waste (Gram)	Paper (Gram)	Plastic (Gram)	Metal (Gram)	Glass (Gram)	Inserts (street sweepings, ash) (Gram)	Animal Waste (kg)
High Income Households							
Middle Income Households							
Low Income Households							

Note: prepare similar details for commercial/institutional waste samples and add the quantities in the quantities derived from household waste generation assessment.

Table 3B.1: Summary table showing waste generated by total household in each category

Category Total (for all samples)	Food Waste (Gram)	Paper (Gram)	Plastic (Gram)	Metal (Gram)	Glass (Gram)	Total Food waste generated (Gram)	Total paper Waste Generation (Gram)	Total plastic Waste (Gram)	Total metal waste (Gram)	Total glass waste (Gram)	Ash	Total Ash generated per Category (Gram)	Total Animal Dung generated per Category (Gram)
	A	B	C	D	E	F= (A–N X Number of Household in each category)	G=(B–N X Number of Household in each category)	H = (C–N X Number of Household in each category)	I = (D–N X Number of Household in each category)	J = (E–N X Number of Household in each category)	Ash contained Per household K	L = (K x Total number of households per category	M = (J– Number of Samples)x Total number of households per category
High Income													
Middle Income													
Low Income													
Total													

WASTE GENERATED BY THE VILLAGE

S. NO.	WASTE GENERATOR	QUANTITY OF WASTE GENERATED PER DAY (KG)
1	HOUSEHOLD WASTE	
2	COMMERCIAL/INSTITUTIONAL WASTE	
3	ANIMAL DUNG WASTE	
4	ASH	
5	**TOTAL**	

PROFORMA FOR ACTION PLAN AND PROJECT REPORT

A. BASIC INFORMATION

1	Name of Gram Panchayat		2	Block	
3	District		4	State	Haryana

B. POPULATION AND AREA

1	Male Population (2017)		2	Female Population (2017)	
3	Child Population (2017)		4	Total Population (2017)	
5	Number of Households		6	Area of GP (sq. km.)	

C. INSTITUTIONS

S. No.	Institutions	Number
Government		
1.	Schools	
2.	Anganwadi	
3.	Primary Health Centre	
4.	Hospital/Clinic	
5.	Offices	
6.	Market	
7.	Others (specify)	
Private		
1.	Schools	
2.	Hospital/Clinic	
3.	Offices	
4.	Shops	
5.	Others (specify)	

D. INTERNAL ROADS

S. No.	Type of road	Length (km)
1.	Concrete road	
2.	Pucca road	
3.	Kutcha road	
4.	Total road length	

E. WATER SUPPLY

A.	**Govt. (PHED) water supply**				
i.	Number of submersible pumps				
ii	Total Hours of supply				
a.	Morning – number of hours		b	Evening – number of hours	
B.	**Public Taps**				
i.	Number of Public Taps		ii	Number of working Public Taps	
C.	**Public hand pumps**				
i	Number of hand pumps		ii.	Number of working hand pumps	
D.	**Private Submersible pumps**				
i.	Number of houses with submersible pumps				
ii.	Capacity (take average)		iii.	Hours of pumping (take average)	

F. SOIL / WATER TABLE

S. No.	Type Description	Yes/No	S. No.	Type Description	Yes/No
1	Permeable (sandy) soil (soaks water readily)		2	Impermeable (does not soak water)	
3	Soil with murum in it		4	Rocky (pathar; if yes at what depth rock is struck)	
5	If Rocky (Pathar) at what depth is rock struck (feet)				
6	Depth at which water is struck in tubewells (in feet)				

G. SOLID WASTE GENERATION

a. HOUSEHOLD WASTE

S. No.	Waste type	Total Quantity of waste generated Daily in GP (Kg))	Present Disposal Practice			
			Proportion of Households utilizing food waste for feeding to animals (%)	Proportion of Households giving away their food waste to other households with animals (%)	Proportion of Households depositing food waste in Khurdi/Pits (%)	Proportion of Households disposing food waste in the open spaces (%)
A	Biodegradable					
1	Food waste					
B	Recyclable		Proportion of Households selling to Kabadiwala (in %)			
2	Paper					
3	Plastic					
4	Glass					
5	Metal					
C	Others		Proportion of Households depositing in Khurdi (%)		Proportion of Households disposing in the open (%)	
6	Ash					
7	Street sweepings					

b. ANIMAL DUNG

S. No.	Description	Number
1	Number of households in GP	
2	Number of households with cattle (Buffalo + Cow)	
3	Average number of cattle per Household (*Calculate for only households with Cattle*)	
4	Total quantity of animal dung (kg)	
5	**Disposal practices**	**Proportion (%)**
a	Proportion of Dung used as Fuel (%)	
b	Proportion of Dung used as manure (%)	
i	Proportion of households storing dung in household premises or in their own open land	
ii	Proportion of households storing dung on the streets or in public premises	

II. LIQUID WASTE GENERATION

S. No.	Description	Quantity Daily (in Liters)
From Households		
1	Total Quantity of grey water (litres/day) in GP	
2	Total Quantity of black water (litres/day) in GP	
From Institutions		
3	Total Quantity of grey water (litres/day) in GP	
4	Total Quantity of black water (litres/day) in GP	

I. ESTIMATED CAPITAL EXPENDITURE FOR SOLID WASTE MANAGEMENT

S.No.	Description	Unit Cost (A) in Rs.	Number of Units (B) in numbers	Total Cost (Rs.) (A x B)
1	**Door to door waste collection & Street sweeping**			
a	Vehicles for collection (Tricycles)	15,000		
b	Vehicles for collection (LCV/Tractor)	700,000		
C	Handcarts for collection of sweepings	10,000		
D	Number of secondary storage containers	12,500		
E	Number of container lifting devices	7,00,000		
2	**Household Food waste**			
a	Number of vermi-pits to treat domestic food waste	7,000		
3	**Animal Dung**			
a	Converting Khurdis to vermi-pits	2,000		
b	Biogas plants at household	30,000*		
4	**Recyclable waste**			
a	Shed for segregation, storage and sale of recyclables (for 1,000 population)	25,000	1 per 200 households	
5	**Inerts (residual waste that cannot be sold plus untreatable waste)**			
a	Pit for burying inerts	2,000	1 per 200 households	
6	**Total Capital Cost (Rs.)**			

* Note: 75% of the cost of biogas (Rs. 40,000) unit will be paid from the project. The beneficiary is expected to contribute 25% of the cost (Rs. 10,000)

REFERENCE TABLE FOR ESTIMATING TOOLS/EQUIPMENT

S. No.	Equipment	Norm for estimation
1	Handcart for collection of sweepings	If GP population < 6000, 1 handcart per 200 households plus 1 spare
2	Tricycle for household waste collection	If GP population < 6000, 1 tricycle per 200 households plus 1 spare
3	Tractor/LCV	If GP population > 6000, 1 Tractor/LCV per 6,000 population
4	Secondary storage containers	if the village is large (population above 6000) or the distance to be travelled exceeds 1 km from the collection area, then 0.5cu.m capacity secondary storage containers required @8 per sq.km
5	Secondary storage container lifting devices	1 device for every 10 secondary storage containers,
6	Vermi-pits for composting biodegradable waste	Dimension of vermi pit 5 (L) m x 1 5 (W) m x 0 6-.7 (D) m. Number of pits to be estimated from Table below

S. No.	Equipment	Norm for estimation	
		Quantity of organic waste to be composted daily (kg)	Number of vermi pits proposed to meet 90 day need
		Upto 25	1
		25-50	2
		50-75	3
		75-100	4
		Add 1 additional pit per 25 additional kg of food waste	
7	Shed for segregation, storage and sale of recyclables	1 shed of dimension 8 ft x 10 ft x 7 ft. height for every 200 households, 80 sq. ft for every 200 households	
8	Converting Khurdis to vermi-pits	Each household/farmer khurdi to be converted	
9	Pit for burying residual waste	Pit of dimension 10 ft x 10 ft x 3 ft = 300 cubic feet per 200 households	

J. ESTIMATED CAPITAL EXPENDITURE FOR LIQUID WASTE MANAGEMENT

S. No.	Description	Unit Cost (Rs.) [A]	Number of units in numbers [B]	Total Cost (Rs.) [AxB]
1	Grey water management - Household			
a	Household leach pit	5,500		
b	Community leach pit (1 serving up to 10 houses)	30,000		
c	Kitchen garden	-		
d	Waste stabilization ponds			
2	Grey water management – Institutions			
a	Household leach pit	5,500		
b	Community leach pit	30,000		
c	Kitchen garden	-		
d	Waste stabilization ponds			
3	Black water management – Households			
a	Household leach pit	5,500		
b	Community leach pit	30,000		
c	Waste stabilization ponds			
4	Black water management – Institutions			
a	Leach pit	5,500		-
5	Total Capital Cost (Rs.)			

REFERENCE TABLE FOR ESTIMATING LABOUR REQUIREMENT

S. No.	Maintenance detail	Norm	Estimation of persondays/year
1	Community Leach pit		
a	Cleaning of silt chambers	Chambers to be cleaned every three weeks; i e 18 times a year 1 person can clean 5 chambers in a day	(Number of chambers – 5) x 18
b	Cleaning of Leach pit	Leach pit to be cleaned once a year. 1 person can clean one leach pit in a day.	Number of leach pits
c	Removal of occasional blockages in pipelines	Assume 10 days per annum	10 days per annum
2	Waste Stabilisation Pond		
a	Cleaning of screens	To be cleaned daily - one hour of work	15 person days per annum
b	Spraying of ponds for mosquito control	To be done once in a week; half a day work	26 person days per annum
c	Removal of occasional blockages in pipelines	Assume 10 days per annum	10 person days per annum
d	Desludging of Pond	About 2 days work with JCB and labour	

K. ESTIMATED ANNUAL OPERATING COST

a. Solid Waste management

S. No.	Description	Number of Personnel	Monthly Salary/Wages (Rs.) [A]	Annual Salary/wage (Rs) [A x 12]
1	Personnel for door to door waste collection @ 1 part time person per 1000 population			
2	Personnel for street sweeping @ 1 sweeper per 1000 population			
3	Personnel for waste processing @ 1 part time semi-skilled person per 5000 population			
	Total Annual Operating Cost for SWM			

b. Liquid Waste Management

S. No.	Description	Number of person days [A]	Daily wage rate for personnel (Rs.) [B]	Annual Salary/wage (Rs) [A x B]
1	**Community leach pit**			
a	Cleaning silt chamber			
b	Cleaning leach pit			
c	Removal of blockages in the pipe line			
2	**Waste stabilization ponds**			
a	Cleaning of screens			
b	Spraying of ponds for mosquito control			
c	Removal of blockages in the pipeline			
d	Desludging of ponds			
3	**Total Annual Operating Cost for LWM**			

L. SUMMARY OF CAPITAL AND OPERATING EXPENDITURE ESTIMATES

S.No.	Description	Cost (Rs)
Capital		
1.	Solid waste management	
2.	Liquid waste management	
	Total	
Annual Operating cost		
1.	Solid waste management	
2.	Liquid waste management	
	Total	

L. SUMMARY OF CAPITAL AND OPERATING EXPENDITURE ESTIMATES

S.No.	Description	Cost (Rs)
Capital		
1	Solid waste management	
2.	Liquid waste management	
	Total	
Annual Operating cost		
1.	Solid waste management	
2.	Liquid waste management	
	Total	

SOLID & LIQUID WASTE MANAGEMENT SURVEY

GRAM PANCHAYAT _____BLOCK _____DISTRICT _____

NAME OF THE SURVEYOR _____DATE OF SURVEY _____

PartA
GENERAL INFO

General Instructions for the Surveyors

- *Give numbers / names to lanes & habitats (bastis) of the GP*
- *Draw separate maps of Individual lanes or habitats (basti) showing details such as houses, drains, grey water outlets, black water outlets, spaces availabl for individual as well as community leach pits, width & length of internal roads, garbage sites etc Also attach a photograph of each lane / habitat.*
- *In case of any doubt / difficulty in filling the format please contact*

Houses &Population

1 Number of Households .

2 Current population .

Male Female : Children

Public Institutions

1 Educational Institutions (Mention number & also whether Govt or private under each category)

Middle . Secondary :

Anganwadis . Other .

2. Health Institutions (mention numbers)

Govt. Hospitals . Govt Dispensaries :

Private dispensaries .

3. Other Institutions (Give name & nature of institutions)

Commercial Places

Shops : Hotels / Restaurants .

Meat / Fish Markets : Vegetable Shops .

Internal Roads

1	Concrete Road (km)	Width of Road (Mtrs.) .
2	Pucca Road (km)	Width of Road (Mtrs.)
3	Kutcha Road (km)	Width of Road (Mtrs.) :

General info about Water Supply &Water Availability

1 Availability of Water Ample/Adequate/Inadequate/Scarce

2. Peoples attitude towards water & water use

a) Water is used judiciously & with precautions : Yes/No

b) Water is used excessively & carelessly : Yes/No

c) Are any measures taken by GP to control excessive water use ? If yes what measures ? : Yes/No

Cattle population in the GP & people's perception

1 Percentage of households having cattle _____%

2 Average number of cattle per household _____

3 Do people regard cattle dung as resource ? In what nature ?

Resources available in the GP

1 Human resources available

a) Paid Safaiwalas (give numbers) _____

b) Youth club (with number of members) _____, _____members

c) Self Help Groups (give numbers) Yes/No; Number of Men Group _____; members: _____Number of Women Group. _____, Members _____

d) Number of Mahila Mandals: _____, Number of members (total) _____

e) Any other groups: _____

2 Land available for community treatment systems

a) Liquid waste (give location and measurements – indicate on the map)

b) Solid waste (give location and measurements – indicate on the map)

SOLID & LIQUID WASTE MANAGEMENT SURVEY

GRAM PANCHAYAT _____BLOCK _____DISTRICT _____

NAME OF THE SURVEYOR _____DATE OF SURVEY _____

Part B
LIQUID WASTE

1) Water Supply

1 Availability of Water (select one) : Ample/Adequate/Inadequate/Scarce

2. Sources of Water Supply

a) Govt (PHED) water supply

i Number of Govt (PHED) submersibles .

ii. Hours of Supply

1. Morning – number of hours .

2. Evening – number of hours :

iii Common Overhead tank for GP :

b) Public Hand Pumps .

i No. of public hand pumps

ii. How many are working ?

c) Private Water Supply .

i No of private submersibles in Houses :

ii Capacity of pump (HP) .
(take general average)

iii Hours of pumping :
(take general average)

d) General water table in the GP :
(depth at which water is struck in tube wells)

2) Soil Type

1 Soil Type (tick the appropriate option)

a) Permeable (sandy) soaks water readily :

b) Impermeable (does not soak water) :

c) Soil with murum in it

d) Rocky (Paththar)

- If yes at what depth rock is struck (feet)

e) Water logged conditions (select one)· No water logging /Seasonal water logging (rainy season) / Permanent water logging

- *Important Note : If you are unable to get correct description of soil type, follow the procedure given below & decide the soil type*
  - a Dig a test pit (approximately - 1ft diameter &2ft depth)
  - b Fill it with water upto the brim
  - c Record observations next day (24 hrs) as below (tick one)
    - i. fully absorbed (permeable soil)
    - ii partially absorbed (semi-permeable soil)
    - iii not absorbed (impermeable soil)

3) **Liquid Waste Generation**

Under this section the surveyor team has to collect information on

1 Quantity of Liquid waste (Grey as well as bla , water if any) generated from individual households

2 Quantity of Liquid waste (Grey as well as black water if any) generated from institutions such as schools, Anganwadi etc

3. Quantity of Liquid waste (Grey as well as black water if any) generated from commercial places such as hotels, hospitals, shops etc

4 Present practices followed at the above places for disposal / management of Liquid waste

5. Space available for management of Liquid waste at individual households / institutions / commercial places

6 Space available at community level / or GP level for management of Liquid waste.

- ***Please fill up the information in following tables by visiting the above places & by interviewing available persons & also by observations.***
- ***Please study the various simple formulas in different columns & how to use them. In Table L1 the first row is filled as a sample to guide the surveyors***

Table L1: Quantity of Grey Water and Black Water in Sample of Households

Sr No	Name of Head of Household	No of adults (N1)	No of children (N2)	Source of water supply (Yes/No)		Storage			Consumption of water	Quantity of Greywater (litre)	Wastewater to			Number of toilets connected to				If Type of Toilet is F, estimate quantity of black water (in litres)	
				PHED	Own source	Overhead tank capacity (litres) - A	Drums Capacity (litres) - B	Total storage capacity – C=A+B	Water consumed daily D= (N1+N2) x 70	Grey water = D x 0 8	Drain (Yes/No)	Open space outside house (Yes/No)	Soak pit (Yes/No)	Septic tank with outlet to soak pit - E	Septic tank with outlet to drain - F	Holding tank (septic tank without outlet) - G	Leach pits - H	With flush (N1+N2) x 10	Without flush (N1+N2) x5
00	*Sample*	*3*	*2*	*Y*	*N*	*200 (A)*	*100 (B)*	*300 (C)*	*350 (D)*	*350x0.8= 280*	*Y*	*N*	*N*	-	*Y*	-	-	*(3+2)x 10= 50*	--
	High Income																		
1																			
2																			
3																			
4																			
5																			
	Average grey water discharge (litres) =																		
	Wastewater discharge (high income) in litres/day																		
	Middle Income																		
1																			
2																			
3																			
4																			
5																			
	Average grey water discharge (litres)																		
	Wastewater discharge (middle income in litres/day																		

Sl No	Name of Head of Household	No of adults (N1)	No of children (N2)	Source of water supply (Yes/No)		Storage			Consumption of water	Quantity of Grey water (litre)	Wastewater to			Number of toilets connected to				If Type of Toilet is F, estimate quantity of black water (in litres)	
				PHED	Own source	Overhead tank capacity (litres) - A	Drums Capacity (litres) - B	Total storage capacity – C=A+B	Water consumed daily D= (N1+N2) x 70	Grey water = D x 0 8	Drain (Yes/No)	Open space outside house (Yes/No)	Soak pit (Yes/No)	Septic tank with outlet to soak pit - E	Septic tank with outlet to drain - F	Holding tank (septic tank without outlet) - G	Leach pits - H	With flush (N1+N2) x 10	Without flush (N1+N2) x5
	Low Income																		
1																			
2																			
3																			
4																			
5																			

Average grey water discharge (litres) =

Wastewater discharge (low income) in litres/day = 24,650

COST ESTIMATION FOR SWM

A. Door to door collection

- Need of part time waste collectors @1 person per 1000 population If population is less than 6000 [ ]
- Cost of manpower: No of part time workers X Rs.5000 or 50% Of minimum wage [Rs.]

- Need of tricycle: No of part time workers+1 spare [ ]

  Cost of tricycle: No of tricycles required X Rs.15000 [Rs.]

- Need of covered tractors or covered LCV for door to door collection of waste if village population exceeds 6000
  Village population/6000= [ ]
- Cost of tractors/LCV
  Number of tractors/LCV X RS 700000 [Rs.]

B. Street sweeping

- Streets and their length that need to be swept by panchayat each day [ ]

- No of part time street sweepers required @1 per 1000 population [ ]

- Cost of street sweepers : No of street sweepers – 1 already existing [Rs.]

  required X Rs.5000 (panchayat has one sweeper

- No of handcarts required for street sweepers @1 per sweeper
  1 tri-cycle existing [ ]
- cost of handcarts: no of handcarts X Rs. 10000 [ ]

C. 1. Secondary storage of street waste if the village is large say above 5000 or the distance to be travelled exceeds 1 km from the collection area

- Area of the village: | Sq km |
- Distance of waste disposal site from the collection area | Km |
- Number of 0.5cu.m capacity secondary storage containers Required @8 per sq.km village area |
- Cost of secondary storage containers Number of containers X Rs 12500 | Rs. |

C.2. Need of a shed to store segregated recyclable Material for 1 month till it is passed on to Recyclers @ Rs 25000 per 1000 population | Rs |

D. Transportation of street waste if containers are placed tractor with Container lifting device required.

- Number of containers/10
- Cost of container lifting device:
- No of device X 700000 | Rs |
- Number of part drivers required @1 per vehicle
- Cost of part time drivers:
- No of part time drivers x Rs.7500 (or 50 % of minimum wage) | Rs |
- Number of part labor required @2 per 1 vehicle
- Cost of part time labor
- No of labor X Rs. 5000

E. Processing of waste

If panchayat is required to collect bio-degradable Waste from the door step:

- Quantity of bio-degradable waste collected from Households, shops and establishments each day

Kg

- Number of vermi pits required as per the following table: _____

SR. No	Village population	Quantity of organic waste to be composted daily (kg)	Number of vermi pits proposed to meet 90 day need
1	500	Upto 25	1
2	1000	25-50	2
3	1500	50-75	3
4	2000	75-100	4
Add 1 additional pit per 25 additional kg of food waste			

Note: Per capita biodegradable waste per day – 50-75 g.
Dimension of vermi pit 5 (L) m x 1.5 (W) m x 0.6-.7 (D) m.

Cost of making vermi pits:

- Number of vermi pits proposed x Rs 7000

Rs.

- Cost of making bio-methanation plants if chosen Instead of vermi composting (Based on following table) (5 x 30,000)

Rs.

To support 5 model projects on 75% support basis

Details	50 kg/day
Capital cost of a biogas plant (INR)	40,000

- **Need of manpower for managing the processing facility**

1 part time semi skilled worker per 5000 population or part thereof

2 cost of part time semi skilled workers

No of part time worker x 6000

Rs

- **Need to convert cow dung pits to vermi pits**

Need to support farmers/cattle breeders for Converting their animal dung storage pit vermi compost pit @Rs. 2000/- per household/ manure pit fo purchasing earthworms and erecting a small thatched roof on the vermi pit using their own labor:

Number of cow dung pits that need to be converted X 2000 (Number* x 2000)

***total number of households with cattle – households with biogas plants (5 demonstration) = number of households to be provided support for vermi pits.**

- **Need of digging a pit for disposal of residual waste to last for 2 years at a time.**
  10 ft x 10 ft x 3 ft

Rs.

Summary of cost for SWM

Sl. No.	Activity	Manpower required (Number)	Amount required for manpower per year (Rs.)	Amount Required for tools, equipment, bins, vehicles, shed, vermi pit/bio-methanation plan etc. (Rs.)	Support to waste generators for bio gas or composting (Rs.)
1	Door to door collection				
2	Street sweeping				
3	Secondary storage				
4	Shed for recyclables				
5	Transportation				
6	Processing				
7	Support to vermi composting				
8	Support to bio methanation				
7	Pit for disposal				
	Total				
	Grand Total				

Signature of Surpanch/pardhan/panchayat secretary

Date: