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APPROACH TOWARDS ENHANCING SANITATION IN GODAVADI VILLAGE THROUGH SUSTAINABLE SOLID WASTE MANAGEMENT

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Abstract – *The objectives of writing this paper is to study the current practices related to the various Solid Waste Management initiatives taken in village for human wellbeing. The other purpose is to provide some suggestions and recommendation to improve the Solid Waste Management practices in village. The paper attempts to understand the important role played by the formal sector engaged in Solid Waste Management in our village. In village the most problem is the Solid waste Management . Solid Waste Management is increasingly becoming a critical issue for municipal authorities in India. The problem of waste generation and management has become a serious issue of concern to many scholars in environmental studies.*

Key Words: **waste generation, waste disposal, urban dwellers, human ecosystem, decentralised waste management, composting, active citizens.**

1.INTRODUCTION

Swachh Bharat Abhiyan(Gramin) was launched in October 2014 with an objective to bring about improvement in the cleanliness, hygiene and the general quality of life in rural areas. The solid waste generated in rural area is predominantly organic and biodegradable, it is becoming a major problem as the waste generated is not segregated in-situ and is of the order of 0.3 to 0.4 million metric tons per day. The Government of India (GoI) as ell as many system to manage solid waste in rural areas. The india country growth to smart country but most of problem is the waste management. Today, the rate at which waste is being generated is about 70% as compared to the total rate of its disposal which is 30%.

This paper provides from 'good practice in Solid Waste Management', presented as a step by step guide. It will help formulate models and systems for solid waste management (SWM) that can serve as practicable system for Gram Panchayats to take up for implementation. The purpose of this Paper is not merely adding to the existing knowledge on SWM, but to provide practicable ideas for implementation.

1.1 NEED OF STUDY

In village situation most of Literacy rate is low. The people do not understand the waste management how the use of waste management and how composting the waste management. The mostly village people do not knowledge the use of Solid Waste Management (SWM) for Biogas plant. So the give the information for the village people about the SWM and how to remove waste in village area

2. FIELD STUDY

Godavadi village in Mandvi taluka in Surat district of Gujarat state, India. Located in rural part of Surat district of Gujarat, it is one among the 103 villages of Mandvi block of Surat district. It is located 53 km towards North from District headquarters Surat. 291 km from State capital Gandhinagar. The geographical area of village is 74102 hectare. The Godavadi village having state code 42 and the village code is 524052. The BHUVAN satellite map of village is shown in figure below :

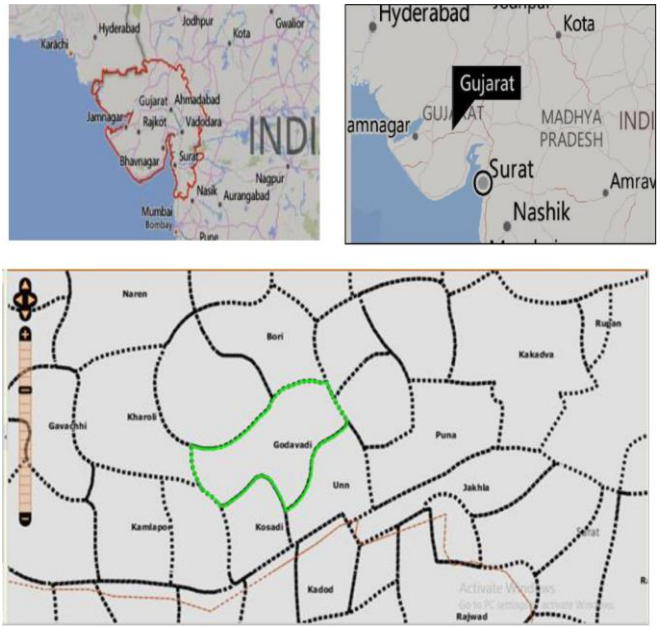


Fig 1: Location and Layout Study Area

The geographical coordinates are 21.253860 latitude, 73.229217 longitude. The pin code of village is 394163 and the village code is 524052. The surat is the district of this village with district code 492.

3. SCOPE OF STUDY

Rural development aim at improving rural people's livehoods in an equitable and sustainable manner, both

socially and environmentally, through better access to assets(natural, physical, human, technological and social capital), and service and control over productive capital (in its financial or economic and political forms) that enable them to improve their livehood on a sustainable and equitable basis.

- Design, develop and provide more efficient and sustainable electricity in rural area.
- Providing better connection of electricity in rural area.
- Developing and Using Sustainable and Economical Planning and Designing.
- Utilizing each resources maximum.
- Create good environment between villagers.

Fig 2 : solid waste

4. SWOT ANALYSIS

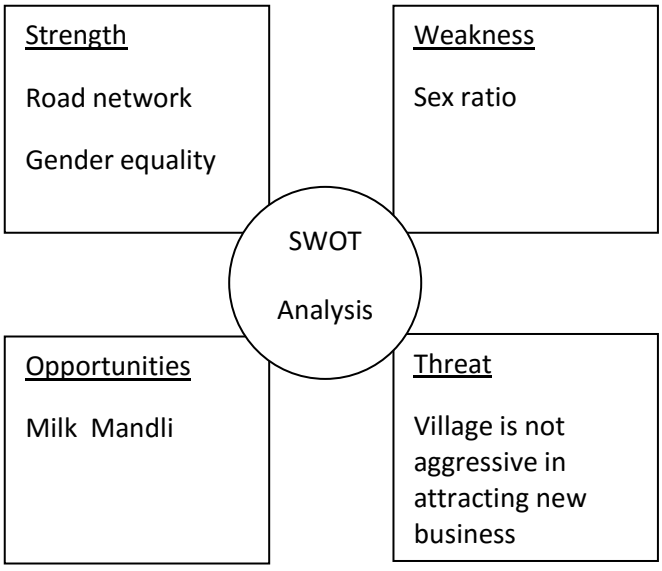


Fig 3 : SWOT Analysis

5. METHODOLOGY

1) Solid Waste Open Burning

Solid waste open burning is not the perfect method in the present scenario because of generation of Air and land Pollution.

2) Sea dumping process

This sea dumping process can be carried out only in coastal cities. This is very costly procedure and not environment friendly.

3) Solid wastes sanitary landfills

Solid waste sanitary landfills process is simple, clean and effective. In this procedure, layers are compressed with some mechanical equipment and covered with earth, leveled, and compacted. A deep trench of 3 to 5 m is excavated and micro-organisms act on the organic matter and degrade them. In this procedure, refuse depth is generally limited to 2m. Facultative bacteria hydrolyse complex organic matter into simple water soluble organics.

4) Incineration method

Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Incineration and other high-temperature waste treatment systems are described as “thermal treatment ”. incineration of waste materials converts the waste, and may take the form of solid lumps or particulates carried by the flute gas. The flue gases must be cleaned of gaseous and particulate pollutants before they are dispersed into the atmosphere. In some cases, the heat generated by incineration can be used to generate electric power.

5) Composting process

Simple composting of vegetables and other organic waste can be applied in many situations. Where people have their garden or vegetable plots, organic waste can be dug into the soil to add humus and fibre. This makes the waste perfectly safe and also assists the growing process. This should be encouraged wherever possible particularly in the larger stages of an emergency programme.

Properly managed composting requires careful monitoring of decomposing waste to control moisture and chemical levels and promote microbial activity. This is design to produce compost which is safe to handle and which acts as a good fertilizer. Such a system requires considerable knowledge, experience and are best managed centrally.

Two method have been used in this process :

a) Open Window Composting

Composting takes places in the open air in large, elongated, uniform prism shaped ‘piles’ of waste known as windrows.

The waste feedstock is mechanically shredded and placed into long windrows on a solid, non-permeable surface. Water may be added, depending on the moisture content of the waste.

The windrows are turned regularly, either with a wheeled loader or by a specialist windrow turner machine (pulled along by a tractor / dedicated vehicle). The windrows are turned several during the compost process, which takes in the region of twelve to sixteen weeks.

- Onsite composting

  In this Composting method are going to compost small amount of wasted food can compost onsite. Composting can significantly reduce the amount of wasted food that is thrown away. Yard trimmings and small quantities of food scraps are not appropriate for onsite composting.

- Vermicomposting

  Red worms in bins feed on food scraps, yard trimmings, and other organic matter to create compost. The worms break down this material into high quality compost called castings. Worm bins are easy to construct and are also available purchase. One pound of mature worms (approximately 800-1,000 worms) can eat up to half a pound of organic material per day. The bins can be sized to match the volume of food scraps that will be turned into castins.

b) Mechanical composting

A mechanical composting plant is a combination of various units which perform specific function. The waste is fed to a slowly moving conveyor belt and the non-decomposable material such as plastic, glass, metals are manually removed by labourers standing on either side of the conveyor belt. The waste is thus subjected to size reduction when the surface area per unit weight is increased for faster biological decomposition. Size reduction also helps in reducing fly breeding in the decomposting mass. This is commonly carried out either in Hammermills or Rasp mills. Hammermills are high speed (600-1200 revolutions per minute) compact machines but consume large energy.

The stabilization is carried out in open windows provided over flagstone paved or cement concrete paved ground. These windrows are turned every 5 days to ensure aerobic decomposition. Various types of equipment such as front end loaders/windrows reshifters are used for turning of windrows.

At the end of the 3 to 4 weeks period, the material is known as green or fresh compost wherein the cellulose has not been fully stabilized. It is hence stored in large sized windrows for 1-2 months either at the plant or the farms. At the end of the storage period, it is known as ripe compost. It may be sometimes subjected to size reduction to suit kithchen garden and horticulture requirements.

6) Disposal by hog feeding

Disposal by hog feeding is not procedure in india. Garbage disposal into sewers including BOD and TSS increases by 20-30%. Refuse is ground well in grinders and then fed into sewers.

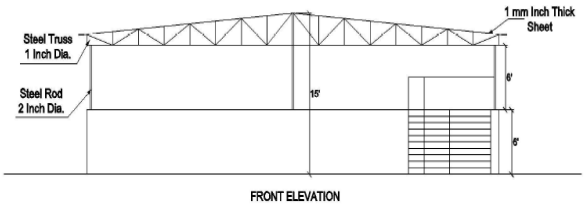
7) Salvaging procedure

Materials such as metal, paper, glass, rags, certain types of plastic and so on can be salvaged, recycled, and refused.

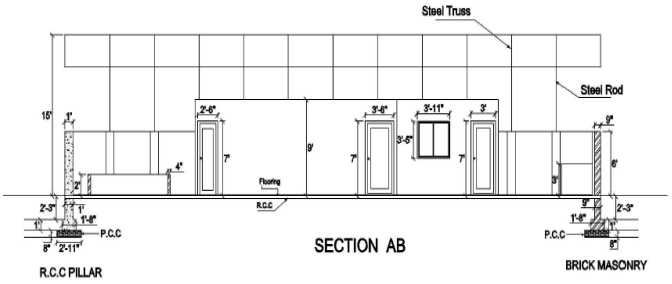
8) Recycling

Plastic, bags, containers, tins and glass will often be recycled since they are likely to be scare commodities in many situations. In most developing countries contexts there exist a strong tradition of recycling leading to lower volumes of waste than in many more developed societies.

6. SWM SUSTAINABLE DESIGN



FRONT ELEVATION



SECTION AB

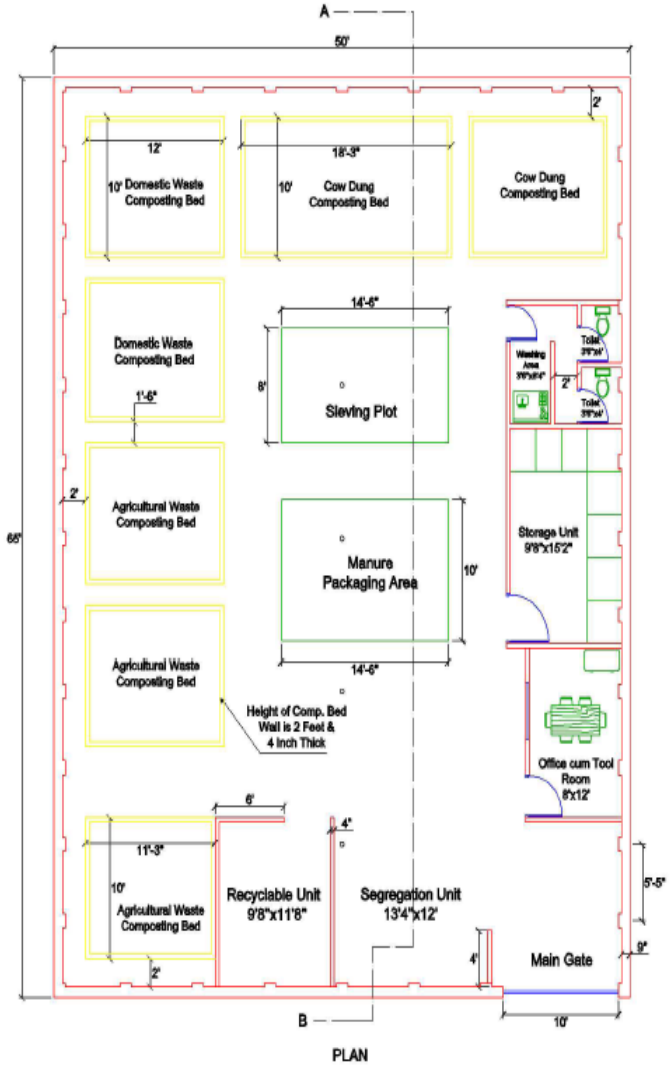


Fig 4: Plan, Elevation & Section for SWM

7. CONCEPT OF SWM

Waste is any item beyond use in its current form and discarded as unwanted. It can be solid with respective management methods.

Solid and fluid, hazardous and non-toxic wastes are generated in our households, offices, school, hospitals, and industries. No society is immune from day to day issues associated with waste disposal. How waste is handled often depends on its source and characteristics, as well as any local, state, and federal regulations that govern its management. Practices generally differ for residences and industries, in urban and rural areas, and for developed and developing countries.

8. ABSTRACT SHEET

NO.	DESCRIPTION	QUANTITY (in ft)	QUANTITY	RATE (Rs)	PER	AMOUNT (Rs)
1.	Excavation for foundation, pits, trenches, compound wall etc. upto 2m depth below existing ground level in any type of soil except rock.	2034.55 ft^3	57.6 m^3	205	m^3	11,808
2.	PCC 1:4:8 using 40 mm and down size graded stone aggregates including machine mixing, providing formwork.	396.34 ft^3	11.22 m^3	2604	m^3	29,217
3.	Brick masonry upto G.L providing and constructing 230 mm & above thickness brick masonry in CM 1:5.	747.2 ft^3	21.15 m^3	3198	m^3	67,638
4.	RCC for Column providing 1:1.5:3 mix for using 20mm and down size graded crushed aggregate including providing and fixing necessary plywood/ steel shuttering, scaffolding, machine mixing, compacting by vibrators, curing, hacking the surface to receive plaster etc. complete.	421.6 ft^3	11.93 m^3	4792	m^3	57,168
5.	Reinforcement supply, fabrication, hoisting and placing in position HYSD reinforcement bars conforming to IS 1786 - Latest Edition Grade FE		3340kg	54876	Metric Tonne	1,83,285

	415.					
6.	R.C.C Slab providing and laying RCC 1:2.4 concrete using 20mm and down size graded crushed aggregate including providing and fixing necessary steel/ plywood shuttering, scaffolding, hacking the surface to receive plaster, machine mixing, compacting by mechanical vibrators, curing, etc complete.	1089 ft^3	30.83 m^3	3692	m^3	1,13,825
7.	Providing and fixing 20mm & higher thickness Kota stone (2' x 2'/1.5') with 25mm to 50mm bedding CM 1:3, cement slurry and machine polishing on one side for flooring and shelf slab including curing, chipping, finishing the joints, scaffolding etc.	3250 ft^2	301 m^2	700	m^2	2,10,700
8.	Brick masonry of super structure providing and constructing 230 mm & above thickness brick masonry in CM 1:5.	1300 ft^3	36.81 m^3	3198	m^3	1,17,718
9.	Providing and laying 15mm thick smooth cement plastering with Niru/ Lime Finish in 1:4 CM in single coat to all the interior walls of sales room & other buildings.	5687 ft^2	528.33 m^2	130	m^2	68,683
10.	Wood Work For Door Window providing and fixing door shutters made of Aluminium panel sheets 3"x1.5" aluminium styles and rails and EPDN rubber for pasted sealing with Aluminium frame, hinges, handles, tower bolts, etc..		6 No.s	2500	No.	15000
11.	Providing corrugated G.S. sheet roofing including vertical/ curved surface fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete.	3380 ft^2	314 m^2	1010	m^2	3,17,140
12.	Providing & fixing of Urinals supplying and fixing coloured (pastel colours) vitreous china flat back urinal of size 300mmx400mm with integrated overflow of Hindustan Sanitary.		2 No.	1200	No.	2,400
13.	Providing & fixing Washbasin providing and fixing coloured wash basins of size 550 x 400mm without pedestal including the accessories		1 No.	2987	No.	2,987
14.	Providing and fixing coloured Counter Top washbasin of Parryware(550 0418)/ Oval Hindware make including accessories		1 Counter	14068	No.	14,068
15.	Mild Steel Tubes & pipes of all diameters as per IS-1161		2394.54 kg	61	Kg	1,46,067
16.	Supplying, erecting and fixing in position prefabricated structures using structural steel sections, plates, flats, square bars, rods etc. at all elevations using structural steel sections conforming to IS:2062, including cutting, welding or bolting, supply of bolts/ nuts/washers etc., complete as per drawings.		2394.54 kg	76	Kg	1,81,985
					Total	**15,39,690**
					5% Contingency	**76,985**
					3% Work charge establishment	**46,191**
					Add 7% Electrification	**1,07,778**
					GST 12%	**1,84,762**
					Operation and Maintenance per Year	**1,50,000**
					Grand total	**21,05,316**

9. BENEFITS

- Reducing or eliminating adverse impact on the environment through reducing, reusing and recycling, and minimizing resource extraction can provide improved air and water quality and help in the reduction of greenhouse gas emissions.
- The use Biogas plant by SWM.
- Improvise the cleanliness of village & give hygienic environment.
- Prevent the mosquitoes nuisance which are caused of some several harmful diseases.
- Reduce air, water & land pollution.
- Through SWM by composting Fertilizers are generated as by product which can be helpful in revenue generation of village.

10. CONCLUSION

Improving the quality of life is a goal we all dream for, which can be achieved by not using only natural resources, it also requires reuse of material which can be replenishable. SWM concept includes smart approach for the reuse of wastage, it saves our resources and help us for minimising reuse. The use waste is an efficient modality for implementing sustainable development, due to the multiple possibilities of recovering material at the same time for reducing energy consumption, which ensures of Environmental protection. SWM concept emphasizes in to improving health and wealth of the society. It helps for creating job, value of resources used, increase energy efficient way and adds financial benefit for the society. SWM is a future need of a country and it leads us towards the healthier and wealthier environment.

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