

One of the challenges of Solid Waste Management is the compatibility of various waste collection mechanisms with the main operator or solid waste processing facility. Every local body sets up its own specifications, signage, vehicles etc., for solid waste management, making inter-linking difficult. The Solid Waste Management Cell of the DST shall formulate a specifications list which shall ensure that there is uniformity in the waste collection tools like bins, tricycles, primary and secondary collection vehicles and so on.

Signage: The Department of Science & Technology, through the SWM Cell shall create appropriate standard signages/symbols which shall be uniformly utilised across the entire State by all ULBS, Organisation, and Industrial Estates, etc.

Standard Operating Procedure (SOPs): The Solid Waste Management Cell has prepared SOPs & work flow which shall be adhered to by the local bodies in various aspects of SWM, These SOPs shall in maintaining the quality of waste, creation of data & records scaling of operations, roles & responsibilities, etc at every stage. In due course of time, the same shall be an online system as described in point No. 6 (MIS & GIS).

5.5 Treatment and Disposal of Solid Waste

5.5.1 Treatment and Disposal of Non-biodegradable Waste

As outlined at Section 2.2 above, dry waste will be further segregated into recyclable and non-recyclable waste, followed by recycling through authorized recyclers and conversion of the non-recyclable component of the waste into RDF or to Fuel through Plastic to Fuel Technology. Thus, there will be no incineration of non-biodegradable and non-recyclable waste.

5.5.2 Treatment and Disposal of Biodegradable Waste

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Biodegradable waste will either be composted or be used for generating Biogas which in turn will be used for generating electricity at the Solid Waste Management. No part of biodegradable waste will be incinerated.

5.5.3 Disposal of Inert Waste

Only the residual/ inert component of the waste shall be disposed in the sanitary landfill. The inert waste generated shall be handed at the local body level as far as possible. ;

These methods for disposal shall be adopted at various levels in the state, as deemed appropriate. The disposal of the other special kinds of waste is outlined at Section 5.6 below.

5.6 Management of other kinds of waste

5.6.1 Management of E-waste

It has been resolved to float an E-tender for management and disposal of E-waste on a pilot basis for a period of 6 months through the Department of Science & Technology. Thereafter, on studying various aspects of the same including the volume of E-waste collected, the collection mechanism, required systemic procedures, etc., a long term tender for management and disposal of E-waste shall be floated.

5.6.2 Management of Bio-medical waste

As per the Biomedical Waste (Management & Handling) Rules 1998, the State should have one Common Biomedical Waste Treatment Facility for the State. Accordingly, the Goa Industrial Development Corporation has been entrusted with the task of identifying land for setting up the said facility and is in the process of doing so. The suitability of the site for setting up the said facility shall be ensured by following appropriate procedures. Thereafter, the Department of Science & Technology shall call for Expression of Interest for setting up

the said Common Biomedical Waste Treatment Facility in the State of Goa at the identified site.

5.6.3 Management of C&D waste

The Town & Country Planning Departments & the Public Works Department (PWD) shall identify abandoned stone quarries and stretches which require filling for dumping of Construction & Demolition Waste. The State also plans to come up with a strategy for ensuring a monitored deposition of the C&D waste in such identified stretches/ quarries. It is also proposed that the Department of Mines & Geology should identify abandoned mines for monitored deposition of C&D waste.

6 Solid Waste Management Plan: Monitoring Mechanism

The successful implementation of a Solid Waste Management System has Monitoring of each Aspect of the System as a very crucial component. The State has taken steps towards this view and this Chapter outlines the monitoring mechanism existing and proposed for solid waste management in the State.

6.1 Monitoring of the SWMFs

Being the Implementing Agency for the proposed Solid Waste Management Facilities, the Goa State Infrastructure Development Corporation shall be responsible for monitoring the setting up and operation of the same as per various Clauses outlined in the Tender Documents, Work Order, Concession Agreement, etc. The GSIDC shall be responsible for all monitoring w.r.t the project milestones, the financial implications and the payments to the Contractor across the years.

The Department of Science & Technology, being Nodal Agency for SWM as per the decision of the Cabinet Meeting of the Council of Ministers, shall ensure that the plants are operated with the overall policies for Solid Waste Management for the State.

6.2 Management and Monitoring of the Collection Mechanism

The details of the Monitoring and the Management for the collection mechanism of waste are found in the table below.

The table below outline details w.r.t arrangement of vehicles, funding for the transportation & monitoring of the transfer of waste.

Table 7 Transfer Stations: Transport, Funding, Monitoring

Transport of waste to and from Transfer Stations						
No.	Description	Transfer Stations in Municipal Areas	Transfer Stations in Industrial Estates	Transfer Stations in Tourism Areas including beaches	Transfer Stations in Forest Areas	Transfer Stations along Highways
1.	Arranging vehicles for transport of waste from points of waste generation (such as Village Panchayats) in the Zone to the Transfer Station	<i>Respective local authority</i>	<i>Respective Industrial Estate</i>	<i>Department of Tourism</i>	<i>Forest Department</i>	<i>GSIDC</i>
2.	Funding for the transport of waste to the Transfer Station	<i>Respective local authority</i>	<i>Respective Industrial Estate</i>	<i>Department of Tourism</i>	<i>Forest Department</i>	<i>GSIDC</i>
3.	Monitoring of the Transport of waste to the Transfer Station	<i>Respective local authority</i>	<i>Respective Industrial Estate</i>	<i>Department of Tourism</i>	<i>Forest Department</i>	<i>GSIDC</i>
4.	Arranging vehicles for transport of waste from Transfer Station to the Solid Waste Management Facilities	<i>DST</i>	<i>DST</i>	<i>DST</i>	<i>DST</i>	<i>GSIDC</i>
5.	Funding for the transport of waste to the Solid Waste Management Facilities	<i>DST</i>	<i>DST</i>	<i>DST</i>	<i>DST</i>	<i>GSIDC</i>
6.	Monitoring of the Transport of waste to the SWMFs	<i>DST</i>	<i>DST</i>	<i>DST</i>	<i>DST</i>	<i>GSIDC</i>

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The following table highlights the responsibilities stakeholders in different aspects of setting up of the transfer stations/ pre processing centres.

Table 8 Transfer Stations: Setting up and Operations

Setting up of Transfer Stations/ Pre-processing Centers					
Sr. No.	Description	Transfer Stations in Municipal Areas	Transfer Stations in Industrial Estates	Transfer Stations in Tourism Areas including beaches	Transfer Stations in Forest Areas
1	Allocation of land/space and handing over after completion of all formalities	Directorate of Municipal Administration	GIDC	Department of Tourism	Forest Department
2	Design	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology
3	Setting up	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology
4	Funding	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology
5	Day-to-day Operation and Maintenance	Directorate of Municipal Administration	GIDC	Department of Tourism	Forest Department
6	Monitoring	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology	Department of Science & Technology

It can be seen that the internal collection within the local body is the mandate of the local authority while the transportation of waste to the proposed SWMF is the responsibility of the DST or Forest Department/ Tourism Department, etc. as applicable. The Department of Science and Technology, being the Nodal Agency for Solid Waste Management, shall do the overall monitoring of the collection mechanism.

6.3 Mobile-based "Black Spot" Application

The proposal for creation of a Black Spot Mobile Application has been approved by the High Level Task Force on Solid Waste Management which is the apex body for taking all decisions pertaining to SWM in the State.

The emergence of smartphones and their utility value has been well understood and the Solid Waste Management Cell has proposed the Mobile-based Application to deal with the menace of "Black Spots" appearing in various locations across the State.

"Black Spot" is an undesignated area where solid waste (biodegradable & non-biodegradeable) is dumped indiscriminately creating a nuisance and eyesore for the residents of the area, in addition to being a health hazard.

The proposed App shall be based on the following platforms:

1. Android
2. Ios
3. Windows

The minimum requirements shall be a Smartphone having GPS facility and a data connection. The following table will explain the functioning of the App.

Table 9 Mobile-based "Black Spot" App

User	Install Application	<ul style="list-style-type: none"> • Android • Ios • Windows
User	Input details	<ul style="list-style-type: none"> • Name • Username • Password • Mobile Phone Number • Etc.
User & Software	Verification & acceptance of terms & conditions	<ul style="list-style-type: none"> • Email • SMS
User	Launch Application	When a blackspot is observed the application needs to be launched with the GPS on.
User	Use camera button, aim & shoot	<p>The photo of the black spot shall contain metadata and geo tagged. This shall help identify the location upto the variance / accuracy of the mobile phone.</p> <ul style="list-style-type: none"> • Photo • Geo location • Date & Time
User	Input of comments	Any comments may be added to this

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		field like date, time, location, when was last seen, etc.
Software	Processing of data	Here the data shall be analysed and jurisdiction in which the black spot lies shall be identified.
Software	Alert to Village Panchayat / Municipality. Etc.	The geo tag and the software shall identify the area / jurisdiction where the black spot was present. This shall be informed via : <ul style="list-style-type: none">• SMS• Email
Local body	Clean & Inform	The local body shall clear up the black spot, identify the perpetrator if possible, levy the fine etc. and send a photo of the cleared area.
User	Response	On completion of the work, the local body shall respond to the identifier.

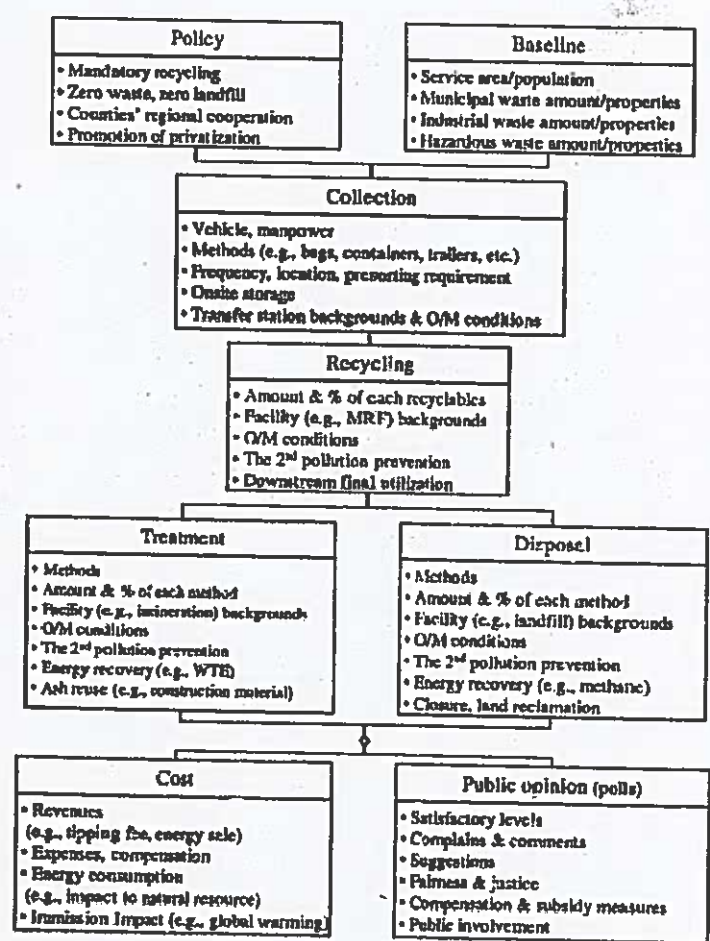
The entire system shall be anonymous and shall be a part of the monitoring mechanism. All data shall be checked by an editor.

6.4 Management Information System, GIS & GPS for SWM

It is proposed that the SWMC shall design and implement a MIS and GIS based software for Solid Waste Management in the State. This shall help in the following ways:

- Generation of Demographic map to analyse the quantum of waste generated area wise.
- Generation of data on waste characterization area wise etc.
- Mapping the location of the waste bins and aid in analysing and help in deciding placement of bins.
- Generating routing maps for collection systems (primary and secondary) and thereby creating an efficient system by analysing the data generated from MIS and GIS

- The investment in an MIS & GIS based software with GPS tracking shall aid in saving collection costs by optimising the routes, decrease in collection timings per bin and also track online the progress of the system in real time.
- Once the system is set up, access shall be given to various functions municipality wise and village panchayat wise. Reports generated shall help in projecting and modifying the SWM plan for the future scientifically and also alert on any change in the waste parameters like quantity, waste characteristics, etc.



O/M: operation and maintenance.
MRF: material recycling facility.
WTE: waste to energy.

Figure 9 Use of MIS and GPS in Solid Waste Management

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6.5 Website and Social Media

The State Government proposes to utilise available and emerging technologies in designing, analysing and implementation of the SWM plan. The use of websites for dissemination of information quickly and also in real time to the general public will be leveraged to the maximum. This shall also act as a grievance portal and act as a monitoring mechanism of the SWM for every Village Panchayat, Municipality and other organisations.

The use of social media like Facebook, Twitter is well known. The State shall design and operate the social media within the parameters set by the State & Central Government. Once the entire mechanism i.e. MIS & GIS, website, social media, Mobile apps are tested and approved by the IT bodies, they shall be linked to make the system real time.

7. Solid Waste Management Plan: Financial Aspects

7.1 Expenses towards Solid Waste Management

7.1.1 Expenses towards SWM at the local body level

Solid Waste Management includes various components such as the provision of infrastructure, tools and implements, man power, setting up the collection mechanism, awareness creation, setting up disposal facilities, sanitary landfills, monitoring, Operations and Maintenance, etc. and costs incurred towards all these are to be met by the local body.

Expenses towards the Solid Waste Management system can be basically classified as follows:

- a. Fixed Expenses: Costs towards Infrastructure, Machinery, Land Acquisition, Set-up of Transfer Stations, Collection Centres, Hardware & Software, etc.
- b. Recurring Expenses: Costs towards Payment for utilities such as electricity, water, security, rent, servicing of vehicles, operational costs, maintenance

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costs, costs for transport of waste, purchase of safety equipment such as masks & gloves, awareness activities, trainings, documentation, etc.

It has been resolved that the respective local authority, shall bear the expenses towards solid waste management including all the fixed and recurring expenses. The local body may seek support from the Government or other sources in various ways as outlined in the following paragraphs.

7.1.2 Yearly Payments towards the Solid Waste Management Facilities

With respect to setting up of the proposed Solid Waste Management Facilities in the State, the Annual Payments to be made to the Contractor have been outlined in the Work Order issued to this effect. The total project cost is Rs 369 crores per plant over a period of 10 years and this cost shall be met as per the budgetary provisions, if the performance is satisfactory as per the conditions of the Tender.

7.1.3 Costs towards transport of waste to the Solid Waste Management Facilities

Costs shall be incurred towards transportation of waste from the Transfer Stations to the solid waste management facilities and such costs shall be borne as outlined in the table Table 7 by the Department of Science & Technology/ GSIDC as the case may be.

7.2 Sources of funding for Solid Waste Management

The different sources for meeting the expenses towards solid waste management are outlined in the paragraphs below.

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7.2.1 Support received from the Directorate of Panchayats and the Directorate of Municipal Administration

The Directorate of Panchayats (DoP) shall be responsible for seeking financial proposals for Solid Waste Management from Village Panchayats in the State. It has been resolved that the DoP shall compile all such proposals and submit the same to the Government for exploring the option of getting funds from the Central Government under various Schemes such as the Nirmal Bharat Abhiyan/ Swachh Bharat Mission, etc. The DoP, in the past, has provided support to the Panchayats under the Rural Garbage Disposal Scheme.

The Directorate of Urban Development (Municipal Administration) is responsible for addressing the financial requirements towards solid waste management of Municipal Authorities as per the proposals submitted by the Municipal Councils/ Corporation. The DMA may seek funds from the Central Government under Schemes like the Nirmal Bharat Abhiyan/ Swachh Bharat Mission/ Grants under the Finance Commission, etc.

It has been resolved that if there is a shortfall even after roping in funds from the Central Government, the State Government shall consider payment of the same.

7.2.2 Levying of Garbage Charges/ Fees

The Panchayat/Council may levy a Charge/ Fee for door-to-door collection of waste. The fee levied depends on various factors like the size of the local body, population, social and economic status, geographical conditions such as terrain, etc. The actual method of implementation and fees for various kinds of organizations/ bodies are at the discretion of the respective local body.

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7.2.3 Funds collected through the Non-Biodegradable Cess

As per the Second Amendment to the Goa Non-Biodegradable Garbage (Control) Act 1996, Rules 1997, the State shall levy a Cess of upto 2% of Sale Price on items marketed in non-biodegradable packaging material including bottles and containers, as may be mentioned in such notification, which shall be utilized for implementation of solid waste management schemes including segregation, collection, safe disposal and re-cycling of non-biodegradable waste material and also to promote the sale and use of biodegradable packaging material, bags and containers. The total revenue from the Cess collected as part of this is around Rs 1.638 crores till date, as per the information obtained from the Department of Commercial Taxes.

7.2.4 Funds collected under Green Cess

The Goa Cess on Products and Substances Causing Pollution(Green Cess) Act, 2013 provides for levying and collection of cess on the products and substances including hazardous substances, which upon their handling or consumption or utilization or combustion or movement or transportation causes pollution of the lithosphere, atmosphere, biosphere, hydrosphere and other environmental resources of the State of Goa, under the concept of "polluter pays principle", and also to provide for measures to reduce the carbon footprint left due to such activities and for matters connected therewith or incidental thereto.

- (1) There shall be levied and collected a cess at such rates as may be specified by the Government by a notification in the Official Gazette, not exceeding two percent of the sale value of the products and/or substances, the handling, utilization, consumption, combustion, transportation or movement, of which, by any means, causes pollution within the State of Goa, from every person carrying out any of the above activities.

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(2) The proceeds of the cess collected under section 4 shall be credited to the Consolidated Fund of the State of Goa and shall be utilized for undertaking the measures to reduce the carbon footprint, by means of such programmes or schemes as may be decided by the Government.

Till date, around Rs 20 crores have been collected as the Green Cess from different Producers, as per the information obtained from the Department of Commercial Taxes.

7.2.5 Fines collected under the Goa Non-biodegradable Garbage (Control) Act & Rules

As per the Third Amendment to the said Act dated 24th September 2014, the following paragraph outlines the fines to be imposed for contravention of provisions of the Act (including littering, non-segregation, etc.):

5A. *Penalty for contravening provision of section 5.— (1) Whoever contravenes any of the provisions of section 5 of this Act shall be punishable with:—(a) a fine of Rs. 200/- for first offence, Rs. 500/- for the second offence, and Rs. 5000/- or with imprisonment which may extend to one month or with both, for every subsequent offence, when the offence is in relation to a residential house; (b) a fine of Rs. 2000/- for first offence, Rs. 5000/- for the second offence, and Rs. 25000/- or with imprisonment for a term which may extend to six months or with both, for every subsequent offence, when the offence is in relation to a commercial establishment.”.*

The officers authorized to fine have been designated and these are Panchayat Secretaries, Police Sub-inspectors, Excise Inspectors, Deputy Collectors, Collectors, All Mamlatdars and Joint Mamlatdars, Chief Officers, Municipal Engineers, Sanitary Inspectors, Municipal Inspectors.

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The amount collected under the fines shall be used for funding different aspects of solid waste management.

7.2.6 Support received through Corporate Social Responsibility (CSR)

Solid Waste Management includes several aspects such as planning, provision of the required infrastructure, setting up the collection mechanism, etc. The State has been able to rope in funds under the Corporate Social Responsibility (CSR) for supply of infrastructural items like garbage bins, tricycles, cage for storage of waste, etc. for the village panchayats. In addition, a Shed for hosting a Material Recovery Facility has been constructed at Cacora. Also, box-type baling machine and forklift have also been provided through CSR funding, thereby resulting in huge cost savings for the State.

7.2.7 Funds as part of the Extended Producer Responsibility (EPR)

Since Extended Producer Responsibility is an important aspect, the State plans to rope in funds under EPR to finance aspects of Solid Waste Management.

8 Solid Waste Management Plan: Awareness

Activities

Undertaking awareness activities is an important part to ensure that all stakeholders are informed about the roles & responsibilities, Schemes & initiatives going on, etc and are on the same platform. The State has already been undertaking awareness activities as outlined in Chapter 4. This Chapter presents the activities planned by the State in this respect in future.

8.1 Awareness Campaigns

The State, through the Solid Waste Management Cell of the Department of Science & Technology shall formulate and design a Media Plan through a professional Agency for audio,

video and print media and implement the same. This plan shall be well spread out in time, shall cover various aspects of solid waste management.

8.2 Preparation of Documents and Resource Material

The State plans to engage a professional agency (as required) for design & preparation of training and resource material, posters, banners, etc. This shall aid in carrying the message of solid waste management to the public; while the training material shall help different stake holders in Solid Waste Management such as on-field workers, supervisors, managerial staff, etc. to understand and implement best practices of Solid Waste Management.

8.3 Workshops, Trainings, Meetings, Conferences on Solid Waste Management

The State's participation and initiatives towards undertaking workshops, etc. on solid waste management have been outlined in Chapter 4. The Government of Goa plans to actively continue with such workshops, meetings, etc. since they provide a platform for interaction and seeking clarifications, sharing experiences, etc.

8.4 Site Inspection and Handholding with local bodies

The Solid Waste Management Cell, Department of Science & Technology plans to continue the handholding and inspections of local bodies like Panchayats and Municipal Councils. The Directorate of Municipal Administration, the Directorate of Panchayats, and the Block Development Officers shall also handhold the local bodies in implementation, financial and other aspects of solid waste management.

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8.5 Activities in Schools

As an extension of the programme already conducted for schools, it is planned to conduct training programs and to supply bins to the remaining Schools in the State with the aid of the Department of Education. It is also planned to incorporate topics pertaining to solid waste management in the School curriculum to inculcate an awareness towards the same right from a young age and also to spread the message to the Students' families.

A "Green Goa" Scheme is also planned to be launched for School Students, which shall include distribution of "Do-it-Yourself" cloth bag kits to students, through the Goa Handicrafts Rural & Small Scale Industries Development Corporation (GHRSSIDC Ltd.). This Scheme shall encourage students to use eco-friendly options like the Cloth Bag, while also carrying the message to their families.

8.6 Mobilizing Garbage Management Committees in VPs/ MCs

The Goa Non-biodegradable Garbage (Control) Rules 1997 outlines formation of Garbage Management Committees (GMC) in Village Panchayats and Municipal Councils. These GMCs can play an important role in efficient waste management within the Panchayat/ Council jurisdiction. The State envisages to mobilize the setting up and functioning of such GMCs across the State.

8.7 Role of the District Magistrate

As per the MSW 2000 Rules, the District Magistrate or the Deputy Commissioner of the concerned district shall have the overall responsibility for the enforcement of the provisions of these rules within the territorial limits of their jurisdiction. A Squad has already been constituted to enforce the provisions of the MSW 2000 Rules, and the Goa Non-biodegradable Garbage (Control) Act 1996, at the District/ Sub-divisional level, in the South

Goa District. The Sub-divisional committees formed will monitor the provisions and submit compliance reports. The District Magistrate shall overall monitor the enforcement of the Acts & Rules through the sub-divisional squads and action against any person/s violating the provisions of the Act/Rules shall be initiated.

9 Legal Aspects of Solid Waste Management

9.1 Acts & Rules Applicable

The Municipal Solid Waste (Management & Handling) Rules 2000 describe the responsibility of every municipal authority within its territory with regards to the provisions of the said Rules and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes.

In addition, the State of Goa has enacted the Goa Non-biodegradable Garbage (Control) Act 1996 and Rules 1997, to deal with especially the non-biodegradable component of waste (Annexure G). The said Act includes Clauses that prohibit littering in public places, drains, etc., the duty of owners and occupiers w.r.t collection of the non-biodegradable waste, penalties for contravening provisions of the Act. The Rules to the Act include various aspects such as Garbage Zones, formation and responsibilities of Garbage Management Committees, powers of different local authorities and members of the Garbage Management Committees, among other Clauses.

9.2 Amendments to Goa Non-biodegradable Garbage (Control) Act 1996 & Rules 1997

Three Amendments to the Goa Non-biodegradable Garbage (Control) Act have been notified, which are briefly described below:


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9.2.1 First and Second Amendments:

The said Amendments (dated 29th Sep 2000 and 28th May 2013 respectively) enable the State to levy a Cess on items marketed in non-biodegradable packaging material including bottles and containers. The Cess collected shall be utilized for segregation, collection, safe disposal and recycling of non-biodegradable waste material and to promote sale and use of biodegradable packaging material, bags and containers. As per the Second Amendment, the Cess can be upto 2% of the Sale Price of the item.

9.2.2 Third Amendment

The Third Amendment to the Goa Non-biodegradable Garbage (Control) Act has been notified on the 22nd of September 2014, to include mandatory segregation of wet and dry waste by all owners and occupiers. The definition of an "Occupier" was expanded to include any person in charge of any place owned by the Central/State Government/Government Company/Corporation or any place where exhibitions and other events are organized. The Amendment also outlines fines that shall be imposed for contravening various provisions of the Act.


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References & Data Sources

1. Reports obtained from the Goa State Urban Development Agency (GSUDA), April 2015
2. Compliance Report prepared by the Goa State Pollution Control Board w.r.t Suo Motu Writ Petition 2/2007
3. <http://www.goatourism.gov.in/statistics/225>
4. www.wikipedia.org/wiki/goa
5. www.censusindia.gov.in
6. Data, Maps and figures have been obtained from the following and other sources on the Internet:
 - a. http://en.wikipedia.org/wiki/Goa#/media/File:Administrative_map_of_Goa.png
 - b. www.mapsofindia.com

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Annexures

ANNEXURE A: SOLID WASTE MANAGEMENT STATUS CHART FOR MUNICIPAL COUNCILS (as obtained from Goa State Urban Development Agency)

Sr. No.	Name of Council	Area/ Population as on census 2011	Waste generated	Collection mechanism	Treatment facility and Capacity	Vehicles in use	Observation	Comments	Scientific Landfill
1	Mormugao Municipal Council	12.12 sq. km / 94393	40 TPD	Door to Door in 18 wards and in 2 wards pending due to non availability of 240 ltr bins. Collection is through partly self help groups/ NGO/Contractor	13 composting units approximately treats 12 tons. Dry waste manual sorting at ward level and at MSW plant Sada. Council has acquired 25000sqmts area at Sada for MSW. The MSW treatment facility is non functional and is moreover a dump yard without scientific land fill.	Total 20 vehicles 5 Compactors Other vehicles open trucks	It was observed that the plant operations at Sada were granted to a private operator by signing a MOU. It was advised that a Show Cause Notice to be issued against the operator asking him for its inability to operate the plant. Further Council to take necessary steps to clear the dumps and make space available for dry sorting stations and scientific land fill.	The Council was directed to use the plot admeasuring 7,000 m2 at Sada for mechanical/manual composting/bio gas for treatment of bio-degradable waste. A bailing m/c has also been provided for effectively bailing dry plastic waste and send the recyclables for further processing. Composting pits within the city to be revived for decentralized composting.	Not available
2	Margao	16.59	50 TPD	Door to Door in	The Council has	15 vehicles	It was been observed	Council to	Waiting for TCP

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		sq.km / 87650	/	all wards through self help groups/ NGO	acquired 15, 000 + 57000 sq. mtr of land at Sonsodo for MSW treatment facility for which an MOU is signed with private operator Formento Greens The plant is functional but lacks the correct feed due to supply of mixed garbage which contains even bio medical and hazardous waste. The operator is also waiting for its permission to build a scientific land fill site.	7-compactors (4-off road/ not working & 3-on road) 4-mini tippers 2-rickshaws (1-brokendown, 1-working) 2-tippers (working)	that the plant is functional but lacks the correct feed due to supply of 100% mixed garbage. It was observed the plant also received Bio-medical waste and hazardous waste for which disposal facility has not been designed.	improve its coordination in collection and transportation and programs to be conducted within the jurisdiction Along with neighboring villages.	permissions (Hill cutting))
3	Mapusa	11.44 sq.km / 39989	20 TPD	70% -80% of City is covered with Door to Door collection using council staff	Council has installed 1.5 Tons Organic waste Converter to treat waste from market also approximate 5 Tons of bio- degradable waste is handled at the Assagao Plateau. Transfer stations	12 vehicles (4-compactors 5-normal trucks 3-tipper trucks)	A proper disposal facility to be built at the Assagao Plateau, work in progress . A scientific land fill to be constructed at the land acquired. Land Acquired at Cuchelim approximately 32000 m2.	Council to improve its coordination in collection and transportation and programmes to be conducted within the jurisdiction and along with the neighboring villages.	Not available

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4	Ponda Municipal Council	/ 22664	12-13 TPD	<p>One of the most successful door to door collection practices covering all wards with over 70% of waste collected and transported in segregated form. Collection thru partly Council staff and partly NGO.</p>	<p>have been built in most of the wards for sorting of waste and transporting of dry waste at the dry sorting station where bailing m/c has been installed.</p> <p>Council has installed 4 Owc machines treating almost 6 tons of biodegradable waste, also council helps in managing manual composting pits within the city. Dry waste is further sorted and recyclable is sent for further process. It is also found that Ponda municipality supplies maximum plastic waste after bailing to the GSPCB facility. Plot admeasuring aprox 28,000 sq mtr in keri village.</p>	<p>5-Vehicles 2 trucks 1 rickshaw</p>	<p>The Council was been carrying out collection in mixed form also the plant available was not</p>	<p>Council needs to Start implementing segregated waste</p>	<p>Available (Under construction almost 70%</p>
5	Valpoi Municipal Council	/ 8532	2-3 TPD	<p>Door to door collection in all wards is carried out by Municipal</p>	<p>have been built in most of the wards for sorting of waste and transporting of dry waste at the dry sorting station where bailing m/c has been installed.</p>	<p>5-Vehicles 2 trucks 1 rickshaw</p>	<p>The Council was been carrying out collection in mixed form also the plant available was not</p>	<p>Council needs to Start implementing segregated waste</p>	<p>Available (Under construction almost 70%</p>

6	Bicholim Municipal Council	10 sq.km / 16986	4 metric tons /day	Door to door collection in all wards is carried out by Municipal daily wage workers since 2008.	The Council has acquired 25,340 sq.mtr area for Disposal of Waste by installing a Waste handling plant and has built a scientific landfill. The plant is well functional and needs upgradation.	10 Vehicles 3-trucks 1-compactor 3 -rickshaws 1-jeeps 2-DI 207	Disposal of Waste by installing a Waste handling plant and a scientific landfill. 1.5 tons by composting units. 1.8 tons windrow composting method.	1 jeep 1 compactor (under repair)	functional. Construction work for the same is over 70% completed. Proposal for balance work to be completed as been submitted and plant is expected for commission as soon as grants are made available. The office of Gsuda would provide all assistance and guidance by appointed NGO for sustainable and scientific disposal of MSW.	It was been observed that the plant is functional it marginally needs correct guidance or experienced Engineers and operators to take care of daily operations and scientifically explain the authorities and staff on the type of waste, feed, sorting, science of composting, handling of Bio-medical and hazardous waste and disposal of recyclables. The plants if had to be revived would be ..	collection and start its plant which has scientific landfill. Council to Introduce levy of door to door service charge.	work completed have proposed DMA to give grants for completion of project)
										Council to improve its coordination in collection and transportation and programs to be conducted within the jurisdiction and neighboring villages.	Available	

7	Sanquelim Municipal Council	14 sq.km / 13651	3 TPD	Door to door collection in all wards is carried out by Municipal daily wage workers.	The Council has Acquired 46,690 sq mtr area for Disposal of Waste by installing a Waste handling plant and has built a scientific landfill. Wet waste by windrow composting method.	4 Vehicles 1-tipper truck 2-Tata mobile mini trucks (1-working, 1-under repair) 1-compactor (under repair)	The Council was been carrying out collection in mixed form also the plant available was not functional. It was been observed that the plant was partly functional and major waste without sorting used to be dumped at the landfill. It needs correct guidance or experienced Engineers and operators to take care of daily operations and scientifically explain the authorities and staff on the type of waste, feed, sorting, science of composting, handling of Bio-medical and hazardous waste and disposal of recyclables. The plants if had to be revived would be sustainable and could easily carry out daily disposal practice.	The Council to improve its coordination in collection and transportation and programs to be conducted within the jurisdiction. Council to implement Levy of service charge effectively.	Available
8	Pernem	16 sq.km	1 TPD	Door to door	The Council has	5 Vehicles	The Council was been	Council to	Available

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Municipal Council	/ 5021	collection in all wards is carried out by 7 Municipal contract workers.	Acquired 28,000 sq mtr area for Disposal of Waste by installing a Waste handling plant and has built a scientific landfill. By composting units	1-garbage compactor 2- hopper rickshaw 2-tricycles	carrying out collection in mixed form also the plant available was not functional. It was been observed that the plant is non-functional as no waste is available to the built capacity. GSUDA has made efforts along with neighboring panchayats to sent their biodegradable waste at the facility and keep the plant functional. It marginally needs guidance or experienced Engineers and operators to take care of daily operations and scientifically explain the authorities and staff on the type of waste, feed, sorting, science of composting, handling of Bio-medical and hazardous waste and disposal of recyclable. The plants if had to be revived would be sustainable and could easily carry out daily disposal practice.	improve its coordination in collection and transportation and programs to be conducted within the jurisdiction and with the neighboring villages.	Not available		
9	Sanguem	4.92 sq.km	2-3 TPD	Door to door	The Council has no	1 compactor	The Council was been	Council to	Not available

Municipal Council	/ 6444	garbage collection through an NGO	machineries and infrastructure for disposal of its Waste and hence the proposed state Garbage plant is only One KM from the city it is waiting for the plant to be functional.	1 truck 1 tempo	carrying out collection in mixed form also the plant available was not functional. The Council has no machineries and infrastructure for disposal of its Waste. The council at presents is using disposal site of Curchorem-Cacora. The council mater for disposal facility is in Hon'ble High court due to objections from local residents. The council has over 15 Composting pits treating almost 1.5 tons of biodegradable waste, dry waste collected separately is bailed and sent for further process.	improve its coordination in collection and transportation and programs to be conducted within the jurisdiction. The council is only counting on the new state plant that has been proposed in south Goa.	Available (But already covered with Un authorized dumping and fire has damaged the geo textile)
10 Canacona Municipal Council	/ 12434	Partly door to door But most of the waste is collected thru unauthorized dumping sites. Council have support of local NGO's that have erected bins within the city with display and	The Council has Acquired 4225 sq mtr area for Disposal of Waste by installing a Waste handling plant. The plant is non functional and is converted into a scientific landfill.		It was been observed that the plant is non-functional it needs correct guidance or experienced Engineers and operators to take care of daily operations and scientifically explain the authorities and staff on the type of waste, feed, sorting, science of composting,	Council to improve its coordination in collection and transportation and programmes to be conducted within the jurisdiction. Use The NGO in making proper awareness and take nessesar steps	

11	Cuncolim Municipal Council	/ 16623	3 TPD	awareness posters for not littering the city.	100% door to door collection by daily wages labour.	The Council has Acquired 28,395 sq mtr area for Disposal of Waste by installing a Waste handling plant and has built a scientific landfill. It has been advised to construct a shed at the plant to handle dry waste, a Heavy duty bailing Machine has been provided for effectively bail and send recyclables or plastic waste. The plant is now observed to be	handling of Bio-medical and hazardous waste and disposal of recyclables. The plant also needs Up gradation construction of a new shed for dry sorting, proper road access and scientific landfill. The plants if had to be revived would be sustainable and could easily carry out daily disposal practice	It was been observed that the plant is functional it marginally needs correct guidance or experienced Engineers and operators to take care of daily operations and scientifically explain the authorities and staff on the type of waste, feed, sorting, science of composting, handling of Bio-medical and hazardous waste and disposal of recyclables. The plants if had to be revived would be sustainable and could easily carry-out daily	to restart operation at the plant.	Council to improve its coordination in collection and transportation and programs to be conducted within the jurisdiction. A dry sorting shed needs to be built for effective processing of waste.	Available
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12	Curchorem Municipal Council	/ 22730	2-3 TPD	Door to door collection thru MLA funded Labours.	The Council has acquired 64,985 sq.mtr area for waste management. The said land is handed over to the state govt. which has proposed a 100 TPD plant for south Goa.	over 80% satisfactory and also measures have been initiated in clearing the existing dry waste dumps from the site.	Total -5 (3-compactors 1-mini truck 1- rickshaw)	Collection system was found to be poor but Council was eager to start with door to door collection with support of MLA. Presently disposal of Waste is by just unscientific landfill there is no proposal before the government as the State Govt. plans for a South Goa 100 tons plant at the available site.	disposal practice.	Council to improve its coordination in collection and transportation and programmes to be conducted within the jurisdiction.	Not available
13	Quepem Municipal Council	/ 14795	3 - 4 TPD	Door to door collection in all wards is carried out by Municipal workers.	The Council has Acquired 20,775 sq mtr area for Disposal of Waste by installing a Waste handling plant and has built a scientific landfill.	over 80% satisfactory and also measures have been initiated in clearing the existing dry waste dumps from the site.	9 Vehicles 2 trucks 1 compactor 2 rickshaws 3 tricycles 1 mini truck	It was been observed that the plant is functional it marginally needs correct guidance or experienced Engineers and operators to take care of daily operations and scientifically explain the authorities and staff on the type of waste.	disposal practice.	Council to improve its coordination in collection and transportation and programmes to be conducted within the jurisdiction.	Available

14	CCP	8.12 sq.km / 70991	72 TPD	Door to door in all the wards	Decentralize facility (composting units, bulk composting facility) from 100 kgs to 10 tons. Temporary disposal site at Parade Ground for horticulture waste for 6-8 tons/day. Material recovery facility for dry waste at St. Inez for 7.5-8 tons/day.	34 vehicles 5-compactors 8 tipper trucks 4-rickshaw 2- Utility vehicles 2- Doomed shaped trucks 1-Ten wheeler. truck 3-JCPs	All composting facilities are functional along with dry sorting station at St. Inez. CCp has proposed a 100 TPD plant at bainguinim. Proposal with state govt.	feed, sorting, science of composting, handling of Bio-medical and hazardous waste and disposal of recyclables. The plants if had to be revived would be sustainable and could easily carry out daily disposal practice.	CCp faces problem in managing waste as no proper disposal treatment facility available. Annual maintenance of some vehicles has to be undertaken	Not Available.
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**Annexure B: Summary of the Compliance Report prepared by GSPCB
w.r.t Directions of the Hon'ble High Court in Suo Motu Writ Petition
2/2007**

PREAMBLE

The Municipal Solid Waste (Management and Handling) Rules came into force in the year 2000. Under the provision of this Rule all Municipal Council/ Corporations are required to make arrangements for collection, storage, segregation, transportation, processing and disposal of Municipal Solid Waste within their jurisdiction. As per Schedule -I of this Rule, the Municipal Council / Corporation was required to identify site for future landfill by 31/12/2002 and set up waste processing and disposal facilities by 31/12/2003 or earlier.

The Government of Goa notified the Rural Garbage Disposal Scheme, 2005 and further amended in 2007. As per the provision in the Scheme, each of the designated Village Panchayat (VP) shall identify a suitable site admeasuring upto 5,000 sq. mts. (approximately) for disposal of garbage within 30 days from the date of coming into force of this scheme and obtain approval for the selected site from the Goa State Pollution Control Board (GSPCB). Further, the Scheme prescribes that collection, storage, segregation, transportation, processing and proper disposal of garbage, as prescribed under the provisions of the Goa Non-biodegradable Garbage (Control) Act, 1996 and the Rules framed there under, shall be the prime responsibility of the Sarpanch and the Secretary concerned. The State Government shall bear the entire cost of maintenance and running of the garbage disposal site for the first three years and thereafter it shall be the responsibility of the concerned Village Panchayat to manage the garbage by levying and collecting utility charges from the persons or establishments generating Panchayat solid wastes.

Various petitions were filed by individuals before the Hon'ble High Court regarding dumping of solid waste / garbage and finally the Hon'ble High Court decided to take suomoto cognizance of non-compliance of provisions of SWM Rules and RGD Scheme by Municipal Councils / Village Panchayat, respectively. The Hon. High of Bombay at Goa in its Order dated 18/02/2009 in S.M.W.P. no. 02/2007 observed and directed at para 8 as follows:

" Since the aforesaid procedure is likely to take some time and with a view to see that in the meanwhile the problem can be solved by interim measures, we direct the concerned Panchayats to make appropriate arrangements for composting of the

biodegradable waste and, in this behalf, we give six weeks time to each of the Panchayats to locate the place for biodegradable waste and, in this behalf, we give six weeks time to each of the Panchayats to locate the place for biodegradable waste and commence composting on that basis at the said site/sites. All the concerned Panchayats shall also collect the plastic waste and store and bale at an appropriate place or send the material for recycling. Within six weeks, the concerned Panchayats should act on this behalf without fail. After a period of six weeks, the Pollution Control Board shall carry out the inspection in connection with each of these Panchayats to find out whether the disposal of waste is being properly carried out or not and shall submit its report before this Court. For this purpose, the Petition is to be listed again for hearing on 28/04/2009. If, for the purpose of carrying out the aforesaid procedure including procedure regarding identification of sites for disposal of biodegradable waste and composting thereof, the Panchayats have to incur expenditure, the Panchayats to maintain appropriate accounts in this behalf and the concerned Authorities shall consider the question of reimbursing such expenditure as per law expeditiously, looking into the importance of matter regarding disposal of garbage,

Further, the Hon. High Court on 03/08/2009 has observed and directed at para 7 of the order as follows:

"In this view of the matter, we direct that the plastic waste collection programme must extend to all Village Panchayats inclusive of all wards of the Village Panchayats. The plastic waste collection shall be done regularly once in a week preferably on Monday of every week. Twice in a month, the collection of the said plastic waste from the Village Panchayats shall be done by the Plastic Collectors nominated by the DoP. Such two time collection in a month shall be preferably made on the first occasion from first day of every month till 15th day and second occasion shall be from 16th day of month till 31st or a last day of the concerned month."

The Hon. High Court then on 22nd June, 2010 vide para (g) directed as follows:

'In the week commencing from 26th July, 2010, the Pollution Control Board will carry out inspection of area falling in the limits of all the concerned Village Panchayats for ascertaining whether compliance has been made with the interim directions of this

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Court. The Pollution Control Board will submit a report of inspection on or before 2nd August, 2010.

The Hon'ble High Court on 18th April 2012 passed an Order directing the GSPCB to conduct inspection as follows:-

"Mr. Nadkarni, Learned Advocate General appearing for respondent No 1 to 6 submits that respondent No 2 (Goa State Pollution Control Board) shall carry out inspections of all Municipal Councils and 26 Coastal Village Panchayats to verify whether the interim directions issued by this Court have been complied with within a period of 8 weeks and submit report thereof. The Statement made by the Learned Advocate General is accepted. Respondent No 2 is permitted to carry out the exercise within a period of 8 weeks and submit a report thereof on the next date. All the Municipal Councils and 26 Coastal Village Panchayats are directed to cooperate with respondent No 2 in this regard. Stand over to 19th June, 2012."

Accordingly, the GSPCB constituted a team to carry out site-inspections of Municipal Councils / Corporations and Coastal Village Panchayats, the details of which is as under:-

TABLE 1

Sr.	Composition of the team	Municipal Councils (MC) / Village Panchayats (VP)	Date of inspection
1	Mr. Nikhil Caeiro (JEE) Mr. Sebastiao Colaco (EA)	Curchorem-Caora MC, Sanguem MC	10/06/2014
2	Mr. Digvijay Desai (JEE) Mr. Vinson Quadros (EA)	Mapusa MC	09/06/2014
3	Mr. Digvijay Desai (JEE) Mr. Vinson Quadros (EA)	Margao MC	10/06/2014
4	Mr. Bento Thomas (JEE) Mr. Ashley Pereira (EA)	Ponda MC	09/06/2014
5	Mr. Bento Thomas (JEE) Mr. Ashley Pereira (EA)	Valpoi MC	12/06/2014
6	Mr. Nilay Shenvi (JEE)	Mormugao MC	19/07/2014
7	Mr. Vijay Kansekar (JEE)	Corporation of city of Panaji	23/10/2014
8	Mr. Nikhil Caeiro (JEE) Mr. Liston Fernandes (EA)	V. P. Agonda, V. P. Cola	13/06/2014
9	Mr. Bento Thomas (JEE) Mr. Ashley Pereira (EA)	V. P. Benaulim, V. P. Varca	11/06/2014
10	Mr. Digvijay Desai (JEE) Mr. Vinson Quadros (EA)	V. P. Colva, V. P. Majorda,	12/06/2014
11	Mr. Nikhil Caeiro (JEE) Mr. Sebastiao Colaco (EA)	V. P. Chicalim, V.P. Sancaole	11/06/2014
12	Mr. Digvijay Desai (JEE)	V. P. Candolim,	11/06/2014

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	Mr. Vinson Quadros (EA)	V. P. Calangute	
13	Mr. Nikhil Caeiro (JEE) Ms. Lee Ann Antao (JEE)	V.P. Naqueri-Betul V. P. Fatorpa-Quitol	12/06/2014
14	Mr. Bento Thomas (JEE) Mr. Ashley Pereira (EA)	V. P. Morjim, V.P. Mandrem	10/06/2014
15	Mr. Nikhil Caeiro (JEE) Mr. Vijay Kansekar (JEE)	V. P. Taleigao,	17/06/2014
16	Mr. Digvijay Desai (JEE) Mr. Vinson Quadros (EA)	V. P. Querim, V. P. Paliem	13/06/2014
17	Mr. Bento Thomas (JEE) Mr. Ashley Pereira (EA)	V. P. Loliem-Polem, V. P. Poinguim	13/06/2014

The Regional Water and Sanitation Group- South Asia (UNDP/World Bank Water and Sanitation Program) had prepared a report on Community Based Solid Waste Management, Project Preparation, Panaji a Case Study in the year 1993. As per the report the waste generation rates for different category as follows:-

TABLE 2

Sr. No	Categories	Basis for computation	Waste generation rates per day
1	Households	Population	207 gms / capita
2	Hotels (Lodging)	Number of Tourist	50 gms / capita
3	Restaurants	Category A	120 Kgs / day
		Category B	30 Kgs / day
		Category C	5 Kgs/ day
4	Shops and Workshop	Number of Shops and Workshops	760 gms / day
5	Office and Institution	Number of Office and Institution	1100 gms / day
6	Hospitals	Number of Hospitals	
		Category A	70 Kgs/ day
		Category B	5 Kgs/ day
		Category C	850 gms / day
7	Market	Number	2000 Kgs / day
8	Street Sweepings	Number of beats	16 Kgs / day

The report further elaborates the average physical characteristic of waste in percentage in Panaji City as follows:-

TABLE 3

Source	Plastic	Paper	Textile	Glass/ Cerami c	Metal	Organi c Waste	Silt Sand and Ash	Miscel aneous
House holds	4.3	11.0	2.6	3.7	0.9	73.78	3.0	0.7
Office and Institution	-	100.00	-	-	-	-	-	-
Shops and Workshops	6.5	43.5	14.9	-	2.4	32.7	-	-
Hotel (Lodgings)	9.4	31.8	1.8	5.0	-	46.3	4.4	1.3

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Restaurants	0.6	2.4	0.2	2.7	-	93.6	0.2	0.3
Hospitals	7.6	11.9	-	4.4	2.2	40.5	0.5	32.8
Markets	-	-	-	-	-	100	-	-
Weighted Average (excluding street sweeping)	2.7	15.0	2.2	2.6	0.6	74.5	1.5	0.9
Street Sweepings	5.9	27.4	7.7	0.5	0.4	30.6	22.0	6.0
Weighted average including street sweeping	3.0	16.1	2.7	2.4	0.6	70.5	3.3	1.4

National Environmental Engineering Research Institute had conducted studies of 59 cities in the year 2004-2005. The report indicates that the Physical Characteristic of Waste is as follows:-

Sr. No	Paper	Rubber, Leather and other synthetics	Glass	Metal	Total Compostable Matter	Inert materials
1	2.91	0.78	0.56	0.33	44.57	43.59

As per the report on Status of Municipal Solid Waste Generation, Collection, Treatment and Disposal in Class-I cities in India prepared by Central pollution Control Board in April 2000 the National average of physical characteristics in percentage by weight of solid waste is as follows:

TABLE 4

City	Characteristics (% by weight)							
	Paper	Textiles	Leather	Plastics	Metals	Glass	Ash, fines and others	Compostable matter
National Average	2.80	1.00	0.38	1.57	0.31	0.94	58.00	35.00

The report by Mr. RanjithKharvelAnnepu in January 2012 on Sustainable Solid Waste Management in India states elaborates the composition of urban MSW in India as comprising of about 51% organics, 17.5% recyclables (paper, plastic, metal, and glass) and 31 % of inerts (Table 5). The moisture content of urban MSW is 47% and the average calorific value is 7.3 MJ/kg (1745 kcal/kg). The composition of MSW in the North, East, South and Western regions of the country varied between 50-57% of organics, 16-19% of recyclables, 28-31% of inerts and 45-51% of moisture (Table 6). The calorific value of the waste varied between 6.8-9.8 MJ/kg (1,620-2,340 kcal/kg).

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TABLE 5

Composition of MSW in India and Regional Variation

Region/City	MSW (TPD)	Compostables (%)	Recyclables (%)	Inerts (%)	Moisture (%)	Cal. Value (MJ/kg)	Cal. Value (kcal/kg)
Metros	51,402	50.89	16.28	32.82	46	6.4	1,523
Other cities	2,723	51.91	19.23	28.86	49	8.7	2,084
East India	380	50.41	21.44	28.15	46	9.8	2,341
North India	6,835	52.38	16.78	30.85	49	6.8	1,623
South India	2,343	53.41	17.02	29.57	51	7.6	1,827
West India	380	50.41	21.44	28.15	46	9.8	2,341
Overall Urban India	130,000	51.3	17.48	31.21	47	7.3	1,751

Considering the observations made in the above cited reports as well as in light of considerable variation in waste generation, its effective treatment and disposal scenario since last 10 - 12 years because of rapid urbanization, industrialization vis-à-vis population explosion and exponential economic inflation, scientific approach towards tackling ever increasing issue of Solid Waste management (SWM) has become a prime concern in majority of Municipal Councils / Village Panchayats through India.

Based on the above assumption as well

as taking average percentage of independent constituents of the Solid Waste, based on the study compiled o available references throughout India, the same may be considered as -

- (a) Plastic - 2% (3, 1.57)
- (b) Paper - 7% (16.1, 2.9, 2.8)
- (c) Textile - 5% (2.7 1.0)
- (d) Glass & Ceramic - 2% (2.4, 0.56, 0.94)
- (e) Metal - 1% (0.6, 0.33, 0.31)
- (f) Organic waste - 75% (70.5, 44.57, 35, 51)
- (g) Silt and sand - 2% (3.3)
- (h) Misc. - 6% (1.4, 43.59, 58.00, 30.00)

Further, for the purpose of simplicity in understanding the average generated quantity, implementing authorities may be sub-divided into three categories -

1. **Urban areas** - including Municipal Councils and City Corporation of Panaji (CCP), wherein we may generalize the average production of waste to the extent of 350 gms per person per day.

Accordingly, in the State of Goa, following local implementing authorities are included:

1. Mapusa Municipal Council
2. Ponda Municipal Council

3. CurchoremMunicipal Council
4. Margao Municipal Council
5. Corporation of City of Panaji
6. Mormugao Municipal Council
7. Village PanchayatTaleigao
8. Village PanchayatChicalim
9. Village PanchayatCalangute
10. Village PanchayatCandolim
11. Village PanchayatColva
12. Village PanchayatBenaulim

2. **Semi-urban areas** – including the clusters of village Panchayats surrounding the vicinity of 5 kms. From the nearest Municipal Council or CCP. Wherein we may generalize the average production of waste to the extent of 275 gms per person per day.

Accordingly, in the State of Goa, following local implementing authorities are included:

1. Valpoi Municipal Council
2. SanguemMunicipal Council
3. Village PanchayatSancoale
4. Village PanchayatMajorda
5. Village PanchayatVarca

3. **Rural areas** – including all authorities excluding (1) and (2) above. Wherein we may generalize the average production of waste to the extent of 200 gms per person per day. Accordingly, in the State of Goa, following local implementing authorities are included

1. Village PanchayatQuerim-Teracol
2. Village PanchayatPaliem
3. Village PanchayatMandrem
4. Village PanchayatMorjim
5. Village PanchayatPoinguinim
6. Village PanchayatLoliem-Polem
7. Village Panchayat Cola
8. Village PanchayatAgonda
9. Village PanchayatNaquerim- Betul
10. Village PanchayatFatorpa-Quitol

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Summary of compliance to the directions issued by the Hon High Court of Bombay at
Goa

Sr. No.	Name of the Municipal Corporation / Councils/Panchayat	Compliance with respect to the directions issued by the Hon High Court
Municipal Corporation / Councils		
1	Mapusa Municipal Council	Not complied with respect to construction of landfill, no bailing machine installed, door to door collection of waste not done from all wards & only one composting unit operational out of seven composting.
2	Ponda Municipal Council	Has complied with directions.
3	Curchorem Municipal Council	Not complied with respect to installation of bailing machine, all mixed waste dumped hazardously at the site, composting facility not in operation., and plastic waste management.
4	Margao Municipal Council	Not complied with respect construction of landfill, no bailing machine installed, door to door collection of waste not done from all wards & all composting units not in operation, mixed waste is sent M/s Sociedade De Fomentos Pvt Ltd. for composting but the same is not adequate.
5	Valpoi Municipal Council	Not complied with respect to composting facility not operational, baling machine not installed however procurement is in progress & has not renewed authorization from GSPCB.
6	Sanguem Municipal Council	Not complied with respect to public awareness, partially complied to door to door waste collection, no bailing machine installed, no proper records of the waste collected maintained , composting facilities not operational and the waste management facilities yet to be established
Village Panchayat		
1	Village Panchayat Taleigao	Not complied with respect to door to door collection, no bailing machine installed, all mixed waste dumped hazardously at approved site & composting facility not in operation.
2	Village Panchayat Chicalim	Has complied with directions.
3	Village Panchayat Calangute	Partially complied with respect to composting facilities, no record of compost generated maintained and plastic waste management. Logbooks are not maintained with respect to quantity of waste.
4	Village Panchayat Candolim	Partilly complied with respect to composting facilities and not complied with respect to maintaining logbook
5	Village Panchayat Colva	Not complied with respect to composting facility,

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		public awareness, door to door waste collection and vp has not acquired land for storage facility. Not complied with respect to composting facility.
6	Village Panchayat Benaullim	
7	Village Panchayat Sancoale	Not complied with respect to composting facility, public awareness & littered waste in significant was observed during inspection.
8	Village Panchayat Majorda	Partially complied with respect to installation of baling machine, procurement of of baling machine in progress.
9	Village Panchayat Varca	Has complied with directions.
10	Village Panchayat Querim-Teracol	Not complied with respect to maintenance of log book for waste collection.
11	Village Panchayat Paliem	Not complied with respect to maintenance of log book for waste collection.
12	Village Panchayat Mandrem	Not complied with respect to installation of baling machine, door to door collection, and littered waste observed along road side.
13	Village Panchayat Morjim	Not complied with respect to installation of baling machine, door to door collection, and littered waste observed along road side.
14	Village Panchayat Poinguinim	Not complied with respect to baling of plastic waste and partially complied with respect to site for rural garbage scheme as waste were littered in the site & no fencing provided.
15	Village Panchayat Lolliem	Not complied with respect to composting facilities, However since the Village Panchayat consists mainly of single dwelling units which are disposing biodegradable waste within premises and there are no commercial establishments requirement for composting facility may be reviewed. Complied with respect to plastic waste management
16	Village Panchayat Cola	Not complied with respect to construction of storage facility of adequate size for storage of collected non -biodegradable waste, baling of plastic waste, maintaining log book for waste collected and doesn't have approval for disposal site from GSPCB
17	Village Panchayat Agonda	Not complied with respect to construction of storage facility of adequate size for storage of collected non -biodegradable waste, baling of plastic waste, maintaining log book for waste collected and doesn't have approval for disposal site from GSPCB
18	Village Panchayat Naquerim-Betul	Not complied with respect to construction of storage facility of adequate size for storage of collected non -biodegradable waste, baling of plastic waste and maintaining log book for waste

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		collected.
19	Village Panchayat Fatorpa-Quitol	Not complied with respect to construction of storage facility of adequate size for storage of collected non -biodegradable waste, baling of plastic waste and maintaining log book for waste collected.

General Conclusions

1. Bicholim, Cuncolim, Sanquelim, Canacona Municipal Councils have identified and have obtained site approval for their respective landfill sites as well as Solid Waste Management Treatment Facility (SWMF) from the GSPCB. Further, the construction of landfill sites and Solid Waste Treatment facility is in the last stages of completion in case of Pernem and Quepem Municipal Councils. Mapusa Municipal Council is treating their bio degradable waste and segregating the plastic waste at the temporary site at Assagoa. Other Municipal Councils / Corporation along with majority of the Village Panchayats (VPs) have largely not complied with the 'Orders' issued by the Hon'ble High Court as also certain provisions of the Municipal Solid Waste (Management and Handling) Rules, 2000 and Rural Garbage Scheme, 2005 and Goa Panchayat Scheme 2007, respectively.
2. Further, Mormugao Municipal Council (MMC) although has established a waste treatment facility, the process technology so adopted requires large area and as such the present area, earmarked for the said purpose, is insufficient to handle the waste very efficiently. It is also informed that the said area lies within 200 meters from the High Tide line (HTL) and as such, the Goa Coastal Zone Management Authority (GCZMA) has denied the NOC for setting up a landfill site at the proposed location. As such, MMC has to identify a alternate suitable site for setting up the said facility.
3. Corporation of City of Panaji (CCP) has established decentralised composting units (i.e. Organic Waste Convertors - OWC) in different areas within its jurisdiction. However, the cumulative treatment efficiency of the total generated city waste, processed through these units, is far below the capacity required considering the large volume of generation of biodegradable waste. Further, it is informed that a landfill site located at Dona Paula is being utilised only for the purpose of disposal of construction debris/ garden waste. As such, the CCP is

required to set up an Integrated Solid Waste Management Facility (ISWMF) including a landfill site for efficient handling of solid wastes. Further, it is given to understand that the CCP, in spite of having acquired the land at Bainguinim in the year 2006 and having obtained authorization of the GSPCB, it has failed to take any initiatives/ make any progress to establish the ISWMF at Bainguinim. It is also informed that since 2006, large construction/developmental projects have been initiated and likely to be completed within the next year or two around the vicinity of the said site.

4. Mapusa Municipal Council (MMC) is presently handling and treating the waste generated within its jurisdiction at the site belonging to Assagao Comunidade. Further, MMC although has also acquired a land, located at Cuchelim to set up treatment as well as landfill facility has not made any significant progress in setting up such a facility.
5. Margao Municipal Council has proposed a treatment facility including a landfill site. However, since then, it has not made any significant progress in setting up the proposed facility.
6. As regard to collection, disposal and treatment of solid waste being generated on the beaches of the Coastal Village Panchayats is concerned, it is informed by the Directorate of Tourism, who has engaged the services of a private waste collection Contractor, that the said Contractor has been very inconsistent in collecting the waste as also not disposing the waste as per the provisions mandated in the Rural Garbage Disposal Scheme.
7. It has been reported that presently there are number of voluntary individuals and agricultural farms / piggeries who have been involved in handling solid waste management without obtaining prior permission, as mandated, from the Government authorities or respective Village Panchayat concerned. As such, it is proposed to inspect such facilities at farms / piggeries concerned so as to ascertain and ensure compliance to the suitable provision of the Rules, as applicable.
8. As per the Present Administrative Structure in Village Panchayats (VP), in general, every Panchayat is served by one Secretary, One Clerk and One Peon with a maximum of two clerks in selected larger / urban Panchayats. Further, there

are no labourers employed on regular basis to perform day-to-day activities related to collection, handling, disposal and management of solid wastes. Thus, it is evident that Village Panchayat has neither any optimum requisite manpower on regular basis to tackle the issue of waste management nor has any technical expertise to suitably suggest scientific interventions while disposing solid wastes.

9. In spite of regular monitoring of the compliance to the Hon'ble High Court directives issued to various local Authorities (Village Panchayats, Municipal Councils and Corporation of City of Panaji) since 2008 as well as directions issued by the Goa State Pollution Control Board (GSPCB) from time to time, no significant progress has been made in achieving/fulfilling compliance to various provisions of the Municipal Solid Waste (Management & Handling) Rules, 2000 and the Rural Garbage Scheme, 2005 by local Authorities, as applicable.
10. There is a lack of awareness among the elected representatives of the local bodies regarding their basic duties towards handling the issue of solid waste management. In addition, there is also lack of awareness among the general public at large regarding the importance of segregation of solid waste at source for efficient and effective management of wastes.

ANNEXURE C
ORDER BY THE DIRECTORATE OF PANCHAYATS A...

No. 19/DP/WASTE COLL/2014/
Government of Goa
Department of Panchayati Raj and
Community Development
Directorate of Panchayats
Junta House, 3rd Floor, 3rd Lift,
Panaji, Goa
Dated: 27.02.2014

~~ORDER~~

Whereas: section 4 of The Goa Non-Biodegradable Garbage (Control) Act, 1996 enjoins a duty upon the Local Authority to provide in place the public receptacles for temporary deposit or collection of non-biodegradable garbage within its jurisdiction. It also lays down that Local Authority should provide separate dustbins for different types of garbage and arrange for removal of the contents of receptacles/ dust bins and arrange for recycling of non-biodegradable garbage.

And whereas the collection and disposal of garbage in jurisdiction of Village Panchayats needs to be given top priority so as to ensure the protection of the environment and ecosystem.

The Government of Goa has already taken several initiatives to empower the Village Panchayats to tackle the menace of garbage and "The Goa Rural Garbage Disposal Scheme," and "The Goa Panchayats (Grants of financial Assistance to Village Panchayats to deal with Plastic Garbage Menace) Scheme, 2007 are some of such initiatives.

This Directorate has been receiving several representations from various Village Panchayats/Sarpanchas that daily wages labourers are not willing to take up the garbage collection work due to unsanitary and unpleasant nature of the work and very few labourers available are demanding high rate of daily wages.

This issue has been considered by the Government and it has been decided to authorize all Village Panchayats in Goa to incur expenditure at the rate of Rs. 350/- per day per labourer from their respective V. P. Fund for the work of collection and disposal of garbage from its jurisdiction subject to following conditions:-

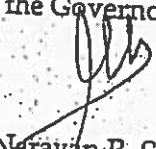
- 1) Village Panchayats should create awareness and impress upon public to segregate garbage at source and also collection of garbage should be undertaken by Village Panchayat from door to door basis wherever practicable;

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- 2) Village Panchayats should draw a plan/scheme for providing service of door to door garbage collection service to all residents on daily/alternate days/weekly as per the need;
- 3) As far as practicable Village Panchayats should plan the garbage collection work for one financial year and get estimates prepared through Engineer from office of B.D.O. and obtain Technical sanction from the P.W.D. and follow the prescribed tendering procedure;
- 4) The Village Panchayats may engage daily wages labourers for this work only during situations when following tendering procedure is not practicable and for such short period may incur an expenditure at the rate of Rs. 350/- per day per labourer from their respective V. P. Fund for the work of collection and disposal of garbage from its jurisdiction;
- 5) The Village Panchayats shall ensure that each labourer engaged for collecting door to door garbage shall cover a minimum of 75 households per day. However, where the households are densely located the number of houses to be covered per day may exceed 75 households.
- 6) Village Panchayat should have sufficient funds available and adequate provision for the same should be there in the Annual Budget of Village Panchayat.

This Order shall come into force from the date of its publication in the Official Gazette and shall remain in force till rescinded.

By order & in the name
of the Governor of Goa


(Narayan R. Sawant)
Director of Panchayats &
Ex-Officio Addl. Secretary (PR)
Govt. of Goa,
Panaji, Goa.

To,
All the Village Panchayats in the State of Goa.

Copy to:
(1) Dy. Director of Panchayats (North)/(South), Margao, Goa;
(2) All the Block Development Officers in Goa.

Copy to:- Director of Printing & Stationary, Govt. Printing Press, Panaji
with a request to publish in EXTRAORDINARY Official Gazette.

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ANNEXURE D
CIRCULAR BY THE DIRECTORATE OF
MUNICIPAL ADMINISTRATION
DEPARTMENT OF URBAN DEVELOPMENT
(MUNICIPAL ADMINISTRATION)

Act
Tenders



Collectorate Building, Ground Floor,
Panaji-Goa-403001.
Telephone Nos: 0832-2427708; Fax:0832-2225690/2225640
E-mail id: dir-dma.goa@nic.in
Website: www.urban-goa.gov.in

ASD (Sum)
Calre

No.10/447/2014-DMA/Part/1161

Dated: 10th July, 2014

CIRCULAR

WHEREAS the Municipal Solid Wastes (Management and Handling) Rules, 2000 have been enacted by the Central Government in exercise of the powers conferred by sections 3, 6 and 25 of the Environment (Protection) Act, 1986 to regulate the management and handling of municipal solid wastes;

And, WHEREAS Rule 7 of the Municipal Solid Wastes (Municipal and Handling) Rules, 2000 mandates that any municipal solid waste generated in a city or a town shall be managed and handled in-accordance with the compliance criteria and the procedure laid down in Schedule II of the said rules;

And, WHEREAS the Hon'ble High Court of Bombay at Goa vide Order dated 13/08/2013 passed in Suo Motu Writ Petition NO. 2/2007 has directed that the municipal solid waste generated by Municipal bodies within the State of Goa is required to be segregated into biodegradable waste/dry/non-biodegradable and further wet waste has to be composted and dry waste has to be baled;

And, WHEREAS the improper collection, littering and disposal of the non-biodegradable waste is causing pollution, health hazard and environmental degradation in the State of Goa;

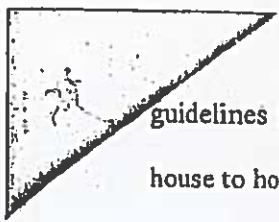
NOW, THEREFORE, in the light of the above and in terms of the Provisions of the Municipal Solid Waste Rules, 2000 the following broad

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Inward No. 5050239
Date: 19/07/2014

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guidelines are being issued to the local bodies i.e. Municipalities for ensuring house to house/ door to door collection of segregated waste:

- (i) The MSW Rules 2000 specify house to house collection and segregation of solid waste. However most of the Municipalities have only partially complied with the said provisions due to lack of knowhow, managerial capacity and financial resources to scientifically treat and dispose of the Non-bio-degradable waste.
- (ii) The State Government through the Monitoring cum Working Committee has established two storage and bailing stations one in Department of Civil Supplies Godown at Karapur Sarvan, Bicholim, North Goa and the other at GHRSSIDC Shed at Kakoda Industrial Estate, Quepem, South Goa.
- (iii) The State Government through the Monitoring cum Working Committee has entered into an MOU with M/S Vasavadatta Cement (Prop. Kesoram Industries Limited), Sedam, District Gulbarga, Karnataka for disposal of non-biodegradable waste through co-incineration in their cement Kiln with approval of the Karnataka State Pollution Control Board.
- (iv) The Monitoring cum Working Committee on Solid Waste Management in the State of Goa through its duly authorized agency/ contractor is also willing to collect the dry waste from all the local bodies from pre-determined storage place without any expenditure for the local bodies thereby making it easier for the local bodies to dispose their dry waste without causing any environmental harm.
- (v) The State Government through Monitoring cum Working Committee has appointed a contractor for transportation of the non-biodegradable waste collected and stored by the Municipalities within their jurisdiction in closed and sheltered premises.

- (vi) During the meetings and discussions it has come to the notice that some Municipalities have appointed contractors for collection, segregation and disposal of the waste. However in many instances the actual location and the manner of disposal is not known. Similarly it has been noticed that the contractors are not paying the Municipalities for the recyclable waste collected.
- (vii) The Municipalities may consider not renewing the waste collection contracts once the contractual period is completed because most of the contractors have no knowledge of methods of scientific disposal of non-biodegradable garbage. To make the situation worse, they are dumping on road sides and other vacant places stealthily, especially in the night time, and even possibly in water bodies causing enormous environmental damages.
- (viii) The Municipalities are therefore advised to organize door to door collection of dry waste (for the time being) from all the households, commercial and non-commercial establishments and public places using labourers employed by the Municipalities.
- (ix) The Municipalities are advised to identify a place for storing the collected dry solid waste. The requirement of land/space for establishing a storage facility of would range from 5 sq.metres to 100 sq.metres depending upon the number of household and commercial establishments in the jurisdiction of the Municipality.
- (x) The Municipality should appoint a contractor for further segregation of the collected dry waste into recyclable and non-recyclables. The recyclables having commercial value could be sold to the contractor for an appropriate price. This Department will issue a standard and uniform tender document for the same.

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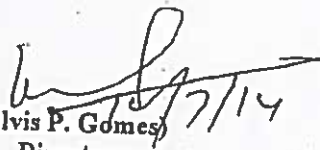
- (xi) The Municipalities are hereby directed to hand over both the recyclable and non recyclables waste to the Government agency approved through the Monitoring cum Working Committee functioning the under the Goa State Pollution Control Board until the tenders are finalized as given above. Once the successful tenderer starts his operation for collection of recyclable waste, the remaining non-biodegradable may alone be handed over to the Government for final disposal.
- (xii) The Municipalities are further directed to purchase and supply cycles or tri-cycles depending upon the terrain conditions to each labourer employed by the Municipalities with modified carriers to fix a small sized waste bin/jumbo bag with suitable coverage to prevent the waste from getting wet in rains, for depositing the daily collection from each house hold.
- (xiii) Any other fund requirements for collection and disposal of waste may be sent to the Government through the Department of Municipal Administration indicating the purpose for which the fund is required and the amount for the same. Based on justification and on a case-to-case basis, the request of the Municipalities will be considered.
- (xiv) The Municipalities are also hereby directed not to invest any resources for the purchase of bailing machines as the Government is equipped to do so. Wherever the bailing machines have already be procured the same should be utilized in the storage place and such baled waste, i.e. the non-bio-degradable may be handed over to the government agency.
- (xv) The MSW Rules empowers the Municipalities to levy a waste collection fee so as to make the entire operations self sustainable. Therefore the Municipalities should levy appropriate waste collection fee. However, it may be ensured that the fee should be collected only after house to house

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waste collection is successfully implemented in the entire Municipality and not before that.

(xvi) The contents of this circular be brought to the notice of all the Councilors/Solid Waste Management Cells and read out in the Council meetings and a compliance Report be submitted by 24/7/2014.


(Elvis P. Gomes)
Director
Urban Development

To,

1. The Commissioner, Corporation of the City of Panaji, Panaji-Goa.
2. The Chief Officer, Municipal Council,

Copy to:

1. The Chief Secretary, Secretariat-Porvorim-Goa.
2. The Principal Secretary (UD), Urban Development Department, Secretariat-Porvorim-Goa, for information.
3. The O.S.D. to Hon'ble Chief Minister, Secretariat-Porvorim-Goa, for information.
4. The O.S.D. to Dy. Chief Minister, Secretariat-Porvorim-Goa, for information.
5. The Director, Science, Technology & Environment, Saligao-Bardez-Goa, for information.
6. The Member Secretary, Goa State Pollution Control Board, Panaji-Goa, for information.