International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:03, Issue:11 "November 2018"

IMPLIMENTATION OF SOLID WASTE MANAGEMENT BY THE LOCAL GOVERNMRNTS: A STUDY DAKSHINA KANNADA DISTRICT

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INTRODUCTION

Global environmental problems such as global warming, acid rain, green house effects, depletion of ozone layer etc. and local environmental problems such as pollutions of air, water and noise, consumerism, loss of bio-diversity, etc. have been increasing due to generation of solid, liquid and gaseous waste. It is the biggest challenge for all the countries of the world. Most of the environment related problems aggravated due to industrialization, extensive use of automobiles and large scale use of household gadgets, growth of consumerism and others. Therefore it is necessary to give priority to 'sustainable development' in order to save this earth and preserve it safely for the future generation. Efficient solid waste management is the pre-condition to promote sustainable development.

Science and technology has changed the total consumption pattern and life style of the entire world. Due to this the huge quantities of different types of solid wastes generate every day. Therefore it is required to reduce the generation of solid waste, proper collection of waste, transportation of waste and utilization of solid waste rather than concentrating only on disposal of waste like land filling. Thus solid waste management involves management of activities associated with the generation, segregation, collection, transportation, storage, reuse and recycling, processing and disposal.

Solid waste management is one of the emerging challenges of growth to the global economy. Solid waste generation is beyond the control of both developed and developing countries. In recent days waste management is not only the problems of urban local self-governments; it is the challenge to the rural local self-governments also. Related to solid waste management, in India the Central Government, State Governments and Local Governments framed, passed and enacted various rules, regulations and acts. In rural and urban areas generation of waste is one of the major problems. The present study analyses the implementation of SWM in rural and urban local governments of Dakshina Kannada district.

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OBJECTIVES OF THE STUDY

Present study has the following objectives:

1. To study the initiatives and implementation of solid waste management in local governments of Dakshina Kannada District.
2. To identify the obstacles of solid waste management in the study area.
3. To give suggestions and recommendations based on the study.

LIMITATIONS

- It focuses only on solid waste management and excluded liquid, gaseous waste and other types of wastes such as industrial hospital, commercial, hazardous, etc.
- The findings of this study cannot be applied to any other areas directly.

SIGNIFICANCE OF THE STUDY

This study has its own significance because it concentrates on the study of collection, segregation, transportation, storage, processing reuse, recycle and disposal of waste both by rural and urban local governments.

METHODOLOGY

This study is conducted in Dakshina Kannada District of Karnataka State. This coastal district has five taluks- Mangalore, Bantwal, Belthangady, Puttur and Sullia (except newly formed Moodbidri and Kadaba, which were in Mangaluru and Puttur taluk respectively). It has 232 gram panchayats (GPs). Out of which 21 GPs are randomly selected for the study. From Belthangady Taluk 4, Bantwal 5, Mangaluru 5, Puttur 4 and from sullia Taluk 3 Panchataths are randombnly selected. Among the 10 urban local self-governments two are newly formed. Remained all the eight are selected for the study.

Primary information has been collected from rural and urban 410 respondents. Out of which 200 from rural local self-governments and 210 from urban self-governments. Secondary data is obtained from text books, Journals, News Papers, reports as well as internet sources.

The total population of the district as per 2011 census 20,89,649. The density of population 457 (2011 census). The literary rate of the district 88.62% and second rank in 2014 Karnataka Human Development Report. The average per capita income of the district in 2006-2007 was Rs. 94,145. District has second position in annual income and per capita income next to Bangalore Urban District.

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To study the implementation of solid waste management separate questionnaires are prepared to collect the data from the local governments and households. The details of data collection are given in the following tables.

Table 1: Details of Rural Respondents

Sl.No	Taluk	Name of the Panchayat	No.of total respondents
1	Belthangady	Ujire	40
2	Bantwal	Vittal	40
3	Mangalore	Kemral	40
4	Puttur	Kadaba	40
5	Sullia	Subramanya	40
Total	5	5	200

Table 2: Details of Urban Respondents

Sl.No	Name of the Urban Local Government	Total No.of household Respondents
1	Mangalore City Corporation	50
2	Puttur City Municipal Council	30
3	Ullala City Municipal Council	30
4	Bantwal Town Municipal Councils	20
5	Moodbidri Town Municipal Councils	20
6	Mulki Town Municipal Councils	20
7	Belthangady Town Panchayat	20
8	Sullia Town Panchayat	20
Total		210

Collection and Segregation of Waste

Waste management includes various aspects such as collection, transportation, storage, segregation, recycle, reuse and proper disposal of various types of non-usable wastes. Collection of solid wastes at primary level (Households and Commercial places) by the local governments is the first stage of waste management. Many studies show the significance of systematic collection and segregation of wastes.

Nag A and Vizayakumar K (2005) suggested the separation of waste as degradable and non-degradable either at the source or during dumping reduces the health hazards. Industrial solid waste contaminates water during rainy season. From domestic, livestock and municipal solid

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wastes usually contain 20% or more moisture in an average. Water either by sprinkling, quenching or flashing but mainly from rain washes the soluble and degradable part of the solid wastes in the dumps and mixes with other water bodies (p.no-19 & 20).

Potimamaka J (2008) observed that more than 50 percent householders do not segregate wastes. In his study the conclusion is households practices were not appropriate towards solid waste management and people must be taught to deal with solid waste by separating it in their homes, schools and work places.

Subhash Anand (2010) in his book "Solid Waste management" suggested that segregation of waste at Source should be mandatory for all. Chain of segregation should not be broken from household to landfill sites organic garbage should be composed. Special attention should be given to lower income group localities particularly vulnerable and critical sites. Solid waste management is an obligatory function of urban local bodies in India. Infrastructure development is not in a position to keep pace with population growth and requirement leading to low level of waste collection efficiency. Lack of financial resources, organizational weakness, improper choice of technology and public apathy towards waste management has made this service far from satisfactory. In future, as the economy improves, the increase in quantity of garbage due to population increase will be reinforced by the rise of per capita income. Additionally, with relative prosperity, more of non-biodegradable waste would be produced in future (Page No: 341).

Chandorkar A G & Nagoba B S (2003) stated that the key to minimization and effective management of health-care waste is segregation (separation) and identification of the waste. Appropriate handling, treatment and disposal of waste by reduce costs and do much to protect public health. Segregation should always be the responsibility of the waste producer, should take place as close as possible to where the waste is generated and should be so maintained in storage areas and during transport. The same system of segregation should be in force throughout the country. Collection of hospital waste is the process which is done after segregation and in a way both can be considered as being complementary to each other. Proper collection of waste should be done right at the point of origin and generation. In correct classification and segregation of wastes can lead to many problems at a later stage. If the infectious waste, which forms a small part of hospital waste, is not properly segregated and if mixed with the other hospital waste, the entire waste will have to be treated as infectious waste. Hence, proper segregation of waste is the key to minimization and effective management of health-care waste (Page No. 179 & 180)

The following table shows the data of segregation of wastes at various stages by the local self-governments.

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Table 3: Segregation of wastes at various stages

Response	Rural	Percentage	Urban	Percentage	Total	Percentage
Yes	16	76	6	75	22	76
No	5	24	2	25	7	24
Total	21	100	8	100	29	100

Source: Primary data

The above data shows that out of 21 rural local governments 16 are insisting waste segregation at primary and secondary collection points. Among them 24 percent do not give any priority for segregation of wastes. Among the 8 urban local governments 25 percent are totally neglecting classification of wastes. Totally 76 percent local governments give priority for the segregation of wastes at various stages.

Manjith Kaur Sandhu (Jagbir Singh ed., 2011) conducted a study in Patiala city Punjab on Municipal Solid Waste Management. He suggested that in order to encourage the citizens, the municipal authority shall organize awareness programmes for the segregation of waste and shall promote the recycling or reuse of segregated material. The municipal authority shall undertake a phased programme to ensure that the community participates in waste segregation. For this purpose, regular meeting at quarterly intervals shall be arranged by the municipal authorities with representatives of local residents, welfare associations and non-governmental organizations. He also suggested that storage facilities shall be so designed that waste stored is not exposed to the open atmosphere and it shall be aesthetically acceptable and user friendly (Page No. 53-61).

Collection of wastes is a big challenge to the local governments. They spend major portion of their total wastes management costs for collection and transportation of wastes. Some institutions opted outsourcing and a few are managing themselves. The following table shows the details of waste collection.

Table 4: Waste collectors at local self-governments

Local Self-Government	By themselves	Percentage	Out sourcing	Percentage	Total
Rural	13	62	8	38	21
Urban	4	50	4	50	8
Total	17	59	12	41	29

Source: Primary data

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Among the selected 21 grama panchaths 13 panchayaths collect wastes by employing 'Poura Karmikas' and daily wage workers. Only 38 percent panchayaths opted outsourcing. But among the urban local self-governments 50 percent manage themselves. People have noticed derelictions in both the methods.

Dakshina Kannada Zilla Panchayath has issued some directions to be followed by all the local governments. But it has not insisted to have its own waste management/disposal site.

Khan H Iqbal & Ahsan (2003) in their study observed the problems of selecting landfill sites. Public resistance to locating a landfill near their residential areas is well known. The general perception is that a landfill deteriorates the environment and is a threat to health and property. This perception is reinforced if care is not taken to ensure good aesthetics and proper maintenance of the landfill site. According to them the landfill should be located away from the community areas but should be easily approachable. There should be sufficient road network available to avoid traffic congestion. Land area available should be sufficient for at least five years. Ground water table should be deep in the area. Areas prone to water logging or flooding should be avoided for land filling. Soil to be used for daily cover should be available nearby.

The following table shows the details about the land ownership for the storage, processing and disposal of various types of solid wastes.

Table 5: Land Ownership of Waste Storage and Disposal in Dakshina Kannada District

Ownership	Rural	percentage	Urban	Percentage
Govt.Site	15	71	6	75
Private	1	5	0	00
No Site	5	24	2	25
Total	21	100	8	100

Source: Primary data

The above table shows that out of 21 panchayaths 15 i.e. 71 percent have their own waste storage and disposable sites. Among the 8 urban governments 6 only have their own land. They use other local governments land on rental basis. In that 24 percent panchayaths and 25 percent urban governments do not have their own land neither for storage of waste nor for disposal of waste.

Sandhya Venkateswaran (1994) advocated low tech method of recycling for Indian situation. The high tech processes which are used in the developed countries would not give satisfactory results in India. The low tech process is based upon labour intensive activity and under this

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method the organic contents were segregated and converted into useful manure with the help of bacteria and worms and inorganic parts were sold to scrap merchants for recycling process .

Degradable wastes used to produce Manure

Most of the local governments use segregated degradable for the production of organic manure and vermi compost. The following table gives details about the utilization of degradable wastes in producing compost in the Dakshina Kannada district.

Table 6: Degradable Wastes Used in Producing Manure

Local Govt	Less than 10%	10-30%	30-70%	More than 70%	Not using	Total
Rural	5	6	5	2	3	21
Urban	1	3	1	0	3	8
Total	6	9	6	2	6	29
Percentage	21	31	21	6	21	100

Source: Primary data

The above table shows that out of 29 randomly selected rural and urban local governments only 2 local institutions (Rural Only) are utilizing more than 70 percent of solid waste to produce organic manure. Among 29 institutions 21 percent are using less than 10 percent wastes for producing compost. The date also shows that 21 percent local governments do not use degradable wastes for any productive purpose.

FINDINGS

- Both rural and urban local self-governments give equal priority for segregation of wastes. Total 76 percent of local governments segregate wastes at various levels.
- It is found that people's participation in rural areas is higher than the urban areas. Only 43 percent of rural respondents not participated in any cleanliness drives. But it is 60 percent among the urban respondents.
- Out of 200 rural respondents 84 (42%) are expecting free waste bins from the panchayats to segregate the waste. But out of 210 urban respondents 113 (54%) are expecting waste bins from their local governments.
- Some people refuse waste bins because waste collectors not collecting wet wastes daily. Total 49 percent of rural respondents and 76 percent urban respondents have door-to-door waste collection facility.

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- Among them 96 percent rural waste collectors insist segregation of waste at source. But in urban areas it is only 58 percent.
- Total 49 percent respondents strongly agreed that local representations (ward members/ grama panchayat members) give their attention for waste management
- Compared to urban governments, grama panchayaths are putting more efforts for segregation and utilization of wastes particularly degradable wastes.

SUGGESTIONS

- All the local governments should have their own land to store, manage and dispose wastes.
- Local governments should give more priority to minimise non-usable wastes through proper segregation of wastes.
- Local self-governments should take strict actions against those who throw waste in to the sea, river, roadside and at other public places.
- Local Governments should follow decentralized waste management system. It will create more awareness among the local people and also enhance their accountability. Urban local governments should give more priority to decentralize waste management. At least 50 percent of degradable wastes must be utilized into production of organic manure.
- In order to encourage the segregation of waste at source local governance has to conduct more awareness programmes and should provide waste bins to the households. It will reduce the quantity of non-usable land filling wastes.
- Various activities must be organized for the communities in order to encourage their participation in waste management.
- Local governments can collect waste management fee from the people to meet management expenses. It is better to impose uniform rate of fees by all the panchayaths. Zilla panchayath has to take the initiative in this regard.
- More plastic collecting Centre's (plastic Soudha) must be constructed. All the panchayaths should open e-waste Centers at their premises.

CONCLUSION

Sustainable development needs proper waste management strategy also. The present study shows that the rural areas are less polluted compared to urban areas. But it is not safe. Waste generation particularly non degradable wastes (Plastic, tin, glass, electrical, electronic and other metal wastes) has been increasing at faster rate. Therefore it should be nipped in the bud. Most of the Grama Panchayaths are very much cautious about the issue. Study has noticed the protests of local people who are residing near to the dumping areas against the disposal/dumping of wastes at their residing areas. To provide justice to those people decentralized system of waste

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management must be followed. It saves time, transport costs and also creates awareness and accountability among the locals. It will also promote people's participation in the swachchatha movement. Grass root level awareness is the best remedy for waste management. Traditional methods of waste management such as vermin composting, pipe compost, bio-gas plants etc. useful not only to reduce the generation of waste at source but also supports organic farming. Once solid wastes are segregated at source as degradable and non-degradable, major problem of waste management would be solved. Local institutions should make proper arrangements in order to segregate the wastes and collection of wastes in the entire village. Besides this each individual should take the initiative in practicing segregation of waste at source. Study observed lack of motivation and propaganda regarding the reduction and classification of waste.

In Dakshina Kannada District many rural householders resorted to pipe compost, vermin composting and small pit compost. Besides this we can see many 'plastic houses' to store waste plastics, which are installed by local organizations and gramapanchayaths. Many grama panchayaths provided free pipes to the householders to install pipe compost at their own kitchen gardens. The implementation of such traditional methods of solid waste management have several direct and indirect benefits like water born and mosquito based diseases can be controlled, helps to maintain the quality of the environment, degradable wastes can be converted into fertilizers and non-degradable re-usable/recyclable wastes can be sold to the scrap shops (gujari shop). Local governments should give more priority for cleanliness, health and hygiene along with management costs.

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