

A Study on the Problems in Waste Management in Rural Areas of Tamil Nadu

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Abstract: These activities impair environmental quality by over loading natural sinks with wastes and pollutants. The environmental consequence of development tends to offset many benefits that may be accruing to individuals and societies on account of rising incomes. There are direct costs on the health of individuals, their longevity and on quality of life on account of deterioration in environmental quality to mention a few. More importantly, the environmental damage can also undermine future attainments and productivity, if the factors of production are adversely affected. However, man's activities have started affecting the quality of the environment. Pollution is a significant facet of environmental concern apart from deforestation, natural calamities, famine, etc. The waste spewed by the developmental activities into the environmental resources without consideration of the assimilating capacity of these resources has seriously affected their quality. The environmental challenges in Tamil Nadu and efforts to tackle them through institutional mechanism, increased public awareness and legislation are explained towards the end of the report. Strict improvement of environmental legislation coupled with environmental consciousness among the public at large alone can bring better environmental future for the present as well as future generation. . Swachh Bharat Abhiyan was launched with basic objective to create sanitation facilities for all and eliminate completely the unhealthy practice of open defecation. The present study tries to make an attempt to account the major environmental issues and its driving forces and consequences and further the mitigation and management measures of environmental protection for sustainable living in the rural areas of the state in general and to know the method of waste collection and its disposal, workers engaged in the waste management, problems faced in the waste management, expenditure incurred on waste management, the environmental management practices adopted by the study villages, etc in particular. Though there are initiatives such as SBM for the improving the quality of sanitation it is not enough to provide the sustainable, resilient, safely managed services that will bring about substantive benefits to health, the economy and the environment.

Key Words: Environment; Waste Management; Sanitations, Waste Recycling, SBM

Introduction

In the recent years not only the GDP and per capita income are the standard indicators for measuring the economic progress of the country, but certain environmental functions, which are crucial for economic performance and generation of human welfare such as provision of natural resources to production and consumption activities, waste absorption by environmental media and environmental services of life support and other human amenities, are taken into account only partly in conventional accounts. Globally, environmental degradation is manifesting itself through the loss of fertile soils, desertification, decreasing forest cover, reduction of fresh water availability, and an extreme loss of biodiversity. These are serious consequences, and it has become clear today that economic development must be environmentally sustainable. The scarcities of natural resources now threaten the sustained productivity of the economy and economic production and consumption activities. These activities impair environmental quality by over loading natural sinks with wastes and pollutants. The environmental consequence of development tends to offset many benefits that may be accruing to individuals and societies on account of rising incomes. There are direct costs on the health of individuals, their longevity and on quality of life on account of deterioration in environmental quality to mention a few. More importantly, the environmental damage can also undermine future attainments and productivity, if the factors of production are adversely affected. Therefore, the private and social costs of the use of the natural resources and the degradation of the environment may be taken into account for the sustainable development in the conventional accounts. Further, Environment is a matrix of various ecosystems existing in a web of delicate relationship. Nature always tries to maintain equilibrium among these ecosystems. However, man's activities have started affecting the quality of the environment. Pollution is a significant facet of environmental concern apart from deforestation, natural calamities, famine, etc. The waste spewed by the developmental activities into the environmental resources without consideration of the assimilating capacity of these resources has seriously affected their quality. Pollution is perceptible in the form of alteration of the physical, chemical and biological qualities of the natural resources - viz. water, air and land. The industrial sector has registered a tremendous growth during the last few decades. Pollution caused by the industrial sector is quite significant. Urbanization in Tamil Nadu is on increase decade after decade leading to consequent problem of disposal of liquid and solid waste. Tamil Nadu is the third industrialised and the most urbanised state in the country. The impact of Industrialisation and urbanisation on environment is substantial as evidenced from rise in hazardous and biomedical waste generation, increasing vehicular population and consequent increase in energy demand and air pollution. The environmental challenges in Tamil Nadu and efforts to tackle them through institutional mechanism, increased public awareness and legislation are explained towards the end of the report. Strict improvement of environmental legislation coupled with environmental consciousness among the public at large alone can bring better environmental future for the present as well as future generation. Research may therefore be usefully directed on the one hand to identify the incidence of rural environmental issues and on the other hand, practices that mitigate damage to environment and enable to safeguard and improve the quality of environment in the rural areas. From the above context, the present study tries to make an attempt to account the major environmental issues and its driving forces and consequences and further the mitigation and management measures of environmental protection for sustainable living in the rural areas of the state.

Earlier Studies

There are number of studies available on the area of waste management both at macro level and Micro Level, such as Skinner (1964). Ansoff (1965), Guth & Parker (1989), Dufumier M. Tiers Monde (1992), Pearce David and Warford (1993), C.K. Varshney (1993), Lopez, (1994), Goodland, R. (1995), Mahinder Chaudhry (1995), AnanthaDuraiappah (1996), Deegan and Gordon (1996), Gray et al (1996), Jnaicke et al (1997), Lemon and Cahan (1997), Janicke M. and Monch H. (1997), Daskalopoulos et al (1997), Graff et al.(1998), Belal (1999), Schaltegger & Burritt, (2000), Larrinaga - Gonzalez (2001), ICRC (2001), Gray and Bebbington (2001), Tilt, Carol Ann (2001), Baleman et al. (2003), Bama & Correlje, (2003), Claerboudt (2004), Blakely (2004), Copeland and Jaylor (2004), Harris and Codur (2004), Atkinson et al. (2004), Sancheeta Ghosh (2005), Staniskis, J. (2005), Berkur et al. (2005), Aye & Widjaya., (2006), Magrinho et al. (2006), Danida, (2006), Mussing (2007), PahlWost, C. (2007), Kumar: Managi, (2009), Vijaikumar Agarwal (2010), Le Blane, D, et al, (2012), Marthez- Penae et al. (2013), Zeng et al, (2016), Hassan et al. (2016), Nilanjan Ghosh, (2018), Ajishnu Roy and Koushik Pramanick (2018), Mani K A S (2018), Nilanjan Ghosh, Soumya Bhowmick and Roshan Saha, (2019), Prabhash K. Dutta (2019), Mahreen Mato (2019), Amitabh Kant (2019), Sivasubramaniyan K. and S. Rajendran. (2019), Soumya Bhowmick, Nilanjan Ghosh (2020) and Roshan Saha (2020) to mention a few.

Objectives and Methodology

The piece of present research work has attempted to know the method of waste collection and its disposal, workers engaged in the waste management, problems faced in the waste management, expenditure incurred on waste management, the environmental management practices adopted by the study villages, etc. There were 30 sample villages were chosen in the study region for data collection and the information relating to this aspect were collected from the authorized persons like Office of Panchayat President, Village Administrative Office information have been analysed.

Analysis and Discussion

Usually in the villages the waste are being collected through vehicles such as try wheeler and tractors in no of vehicles used for the waste collection In the selected sample villages has been given in the table 1 and it is observed that in the most of the villages less than 3 vehicles along used for waste collection which account 77% while in the rest of the 7% villages (23%) where more than 3 Vehicle are being used for waste collection. This difference may be mainly due to the no. of houses and population size of the villages.

With the regard to the frequency of waste collection it is appreciable to note that in the 70% of the villages (21) the waste are being collected daily, in 20% of villages it is being collected in alternative days and it is regarded to observe that in 3 villages the waste are being collected once in a week. From this observation it is know that in the study area the waste are being effectively collected.

The problem related to public attitude on the waste management in the study villages has also been analysed. It is observed that the general problem such as lack of public support lack of waste segregation, lack of awareness, method of disposal poor tax amount and collection etc. are the general problems in the study villages. From the collected data the problem related to segregation of household waste is found in 90% of villages followed by the problem in the public lack of awareness was found in the 77% of the villages, problem in the littering of waste is found in 70% of the villages and however among the 53% of the villages (16 villages) the problem is in relation to tax payment and tax collection.

Table 1 Incidence of Problems in Waste Management Distribution(Public and Sanitary Workers)

S.No	General Public Problems	No. of Villages	S.No	Problems Relating to Sanitary Workers	No. of Villages
1	Lack of Public Support	19(63)	1	Absenteeism of Worker	2 (07)
2	Lack of Waste Segregation	27(90)	2	Shortage of Workers	13(43)
3	Lack of public Education and Motivation	23(77)	3	Lack of Technical Knowledge	6(20)
4	Littering of Waste by Public	21(70)	4	Lack of Commitment of Elected Representatives	3(10)
5	Tax Evasion and Poor Tax Recovery Rate	16(53)	5.	Lack of Work Efficiency	2 (07)
6	Low Rate of Taxes	18(60)	6.	Dispute Attitude	2 (07)

Note: Data in the Parenthesis refer to Percentage

The another important problem in the waste management of this study area is related to the sanitary workers and the major problems related to sanitary workers in waste management are absenteeism, shortage/ lack of technical knowledge, lack of commitment and poor health. From the collected data it is clearly observed that the shortages of workers was the major problem which was faced in 13 villages followed by poor health condition of workers (28%) lack of technical knowledge of workers (20%) lack of commitment of workers (14%) and it is also known that in two villages the problem workersabsenteeism, Inefficiency and even tendency of creating disputes was found..

Problems relating to general waste management in the selected study villages such as absence and improper legislation, lack of shortage of funds and lack of professionalism in management. The lack of participation of NGO was found in 23 villages followed by the absence and improper legislation (22), low prioritization (9) shortage of funds (6) and lack of professionalism in management observed in two villages.

Table 2.Incidence of Problems in Waste Management Distribution (Administration and Waste Disposal)

S.No	Problems in Management	No. of Villages	S.No	Problems in Methods of Disposal of Recycles Waste	No. of Villages
1	Absence of Strict Laws and Improper	22 (73)	1	Kitchen waste	24 (80)
2	Lack of Participation by NGO	23(77)	2	Slaughter houses	03(10)
3	Shortage of Funds	06(20)	3	Shortage of recycling industries	26(87)
4	Lack of Professionalism in Management	02(07)	4	Excessive dependence on informal sector for recyclables	21(70)
5	Poor Fund Allocation for Solid Waste Management	09(30)	5.	Others	14(47)

Nature of waste problems in the method of disposal of is analysed and it is known from the table that the availability of various sources of waste and the problems of disposal of kitchen waste was

realize by 80% of the villages. Further it is also noted that 70% of villages have informed that the dependence on informal sector was the major problem and only 10% of the villages have obtained that the problem is because of the disposal of sligher they have suffered from the problem of shortage of recycle facility from this analysis its clear to note that mast of the villages have faced the problem of lack .of thumbing and disposing facility and recycling of waste facilities also.

In recent years the waste management in rural areas have been given due weightage to reach objective of clean and green villages for which a considerable amount are being spent. Among the study villages it is appreciable to note that expect of villages the expenditure incurred on the waste management exceeds above Rs 25 thousand for month. Further it is notice that in the 50% of the villages more than 50,000 per month is spent for waste management.

Problem faced by the village panchayat in the waste collection there are about 25 problems regarding the waste collection and waste management in the rural areas in general to know the incidence of various problems the opinion is sought from the village administrative personal. It is known from the table that all the villages have faced and have strongly agreed that there is a problem in the shortage of recycling in their areas. In 28 villages there was strongly opined that there is a problem in the segregation of waste at generation level. Further it is noted that the lack of private sector involvement shortage of funds low tax rate littering of waste by public shortage of sanitary workers poor fund allocation are the incidents of problem at the highest level. Very few i.e less than 20% have opined that except the outdated equipment and vehicles worker absenteeism lack of transportation facilities lack of technical knowhow shortage of land for disposal and lack of commitment of elected representatives there is no problem in the waste collection and management. Further it is found that based on the mean value of the licked scale the shortage of recycling industries. Lack of NGOs participation problems in the waste segregation shortage of funds shortage of sanitary workers generation of waste from construction and demolition and problems in implementation of legislation are the highest level of incidents of problems in waste collection management in rural areas.

Table 3. Incidence of Problems of Transport used in Waste Management Distribution

S,No	particulars	No.of Villages	Percentage
1	Lack of Equipment	23	77
2	Outdated Equipment Vehicles	12	40
3	Lack of Treatment Facilities for Hazardous Waste	16	53
4	Transportation for Waste Treatment	11	37

The data relating to problems in the transportation services involved in the waste collection of this study area or analyzed and it is found that among the various problem the maximum of 77% of the villages are suffering from the problem of high expenditure incurred in transportation service followed by the problem in the transportation work in found in 53% of the villages, frequent breakdown is found 37% of the villages and the problem of low efficiency of vehicles is found in four villages only

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Table 4. Problems faced by the Village Panchayats in Waste Collections
(5 for Strongly Agree, 4 for Agree, 3 for Neutral, 2 for Disagree, 1 for Strongly Disagree)

S.No	Problems	5	4	3	2	1	Mean Score
1	Public Opposition and Lack of Public Support	3	22	-	5	-	7.53
2.	Lack of Waste Segregation at Generation Level	28	2	-	-	-	9.86
3.	Lack of Public Education and Motivation	12	8	5	5	-	7.80
4.	Absence of strict laws and improper legislation	23	5	2	-	-	9.40
5.	Lack of Waste Collection Equipments	12	8	5	5	-	7.80
6.	Frequent Absenteeism of Sanitary Workers	5	10	-	5	10	5.67
7.	Shortage of Sanitary Workers	25	5	-	-	-	9.69
8.	Littering of Waste by Public	26	4	-	-	-	9.33
9.	Outdated Equipments and Vehicles	12	8	-	5	8	7.13
10	Excessive Construction and Demolition Waste	22	6	3	-	-	9.20
11.	Lack of Treatment Facilities for Hazardous Waste	8	16	5	1	-	8.10
12.	Waste Thrown to Street from Slaughter Houses	5	18	2	5	-	7.53
13.	Lack of Participation by NGO'S and Residents Association	23	5	-	2	-	9.27
14.	Lack of Transportation for Waste Treatment and Land Filling	12	8	-	5	5	7.13
15.	Lack of Technical Know -How	11	8	3	8	2	7.47
16.	Insufficiency of Land for Treatment and Disposal	-	5	5	12	8	4.47
17.	Shortage of recycling Industries	30	-	-	-	-	10
18.	Excessive Dependence on Informal Sector for Recyclables	25	5	-	-	-	9.67
19.	Shortage of Funds	26	4	-	-	-	9.73
20.	Tax Evasion and Poor Tax Recovery Rate	10	5	-	5	10	5.67
21.	Low Rate of Taxes and User Fees	27	3	-	-	-	9.80
22.	Lack of Commitment of Elected Representatives	18	10	4	5	3	7.0
23.	Lack of Private Sector Involvement	26	4	-	-	-	9.73
24.	Lack of professionalism in Management	19	7	4	-	-	9
25.	Poor fund allocation for Solid Waste Management	22	6	8	-	-	9.33

Table 5. Environmental Management Practices Distribution

S.NO	Particulars	No .of Villages	percentage	Rank
1	Water Bodies Management	7	23	VIII
2	Sapling Plantation	30	100	I
3	Awareness Programmes	26	87	II
4	Waste Bins Distribution with Handbills	18	60	IV
5	Educative Information	16	54	V
6	Cultural Events/ Rangoli Competition	09	30	VII
7	Commons Campaign Clean	24	80	III
8	Announcing Prizes & Gifts	06	20	IX
9	Others	12	40	VI

The villages engaged in the waste management in the study area is considered for analysis and it is observed that Management of Water Bodies , Sapling Plantation, Awareness Programmes, Waste Bins Distribution with Handbills, Educative Information, Cultural Events/ Rangoli Competition, Commons Campaign Clean and Announcing Prizes & Gifts are the major management practices being followed in rural areas. It is noted that among the sample villages, in all the selected villages they have

planted saplings every year; the awareness on importance of environment has been undertaken in 87% of villages followed by in 80% of villages they have arranged for Common Campaign Cleaning works periodically. It is appreciable to find that in nine villages, they have arranged for Cultural Events/Rangoli competition on environmental protection.

Conclusion

The SBM, consisting Swachh Bharat Abhiyan- Gramin focuses on improving the ambit of rural sanitation coverage and eliminating the practice of open defecation. The scheme also focuses on improving the management of solid and liquid wastes; and Swachh Bharat Abhiyan- Urban aims to ensure three-fold objectives within its scope. It mainly aims to promote cleanliness and hygiene in a wholistic manner; to reduce the incidence of open defecation; to bring improvement in the quality of life in rural areas; to encourage the concept of sustainable sanitation practices; to create awareness about health and hygiene; to help India reach to India Sustainable Development Goal 6; to encourage cost-effective sanitation efforts.; to develop community managed sanitation systems ; to focusing on scientific Solid & Liquid Waste Management systems.; and to create a positive impact on gender and promote social inclusion specifically. Moreover, the SBMG emphasized a community-based approach with a focus on raising awareness and encouraging collective behavior change, and thus generating demand for toilets in rural areas. The State, Tamil Nadu has have given a new thrust to the Sanitation front towards declaring the state as an 'Open Defecation Free State', by strengthening institutional arrangements for implementation, ensuring availability of funds, provision of infrastructure and also through sustained IEC campaigns. All the Integrated Women Sanitary Complexes in rural areas have been renovated and efforts are on to ensure continuous usage and maintenance through the Habitation level user groups. 'Clean Village Campaign' for promotion of clean environment and sanitation in rural areas has been reintroduced. Effective disposal of solid and liquid wastes, ban on use of plastics with due emphasis on water conservation and rain water harvesting structures will be part of the campaign. However, still we have to go a long way to achieve the desired objectives of the effective sanitation management in rural areas.

It is suggested that proper measures to be taken to create public awareness and to bring about changes in public behaviour through development of Public awareness programs, such as Promotion of "Reduce, Re-use and Re-cycle (R-R-R)" of Waste Principle; Promotion of Public Participation in SWM Systems; Provision of Information Hot-line; Inculcation of Public Education through Group Education by Group Meetings in the community, Workshops, Exhibitions, Lecture series, Panel Discussions, etc.; Promotion of Mass Education through the Use of Print Media, Use of TV / Cable TV / Radio/Web Site, Use of Cinema Halls, Street Plays, Puppet Shows, etc., Posters, Pamphlets, Use of Public Transport System, Use of School Children, Provision of Primary School Curriculum to cover the subject, Involvement of National Cadet Corps (NCC), National Social Service, Involvement of Religious Leaders, Involvement of Medical Practitioners, Involvement of SHGs, Resident Associations and Voluntary Organizations/NGO involvement. Though there are initiatives such as SBM for the improving the quality of sanitation it is not enough to provide the sustainable, resilient, safely managed services that will bring about substantive benefits to health, the economy and the environment. The rates of progress need to double to achieve basic sanitation for all, and universal access to safely managed sanitation requires them to quadruple. Since sanitation as basic rights of everyone, there would be a paradigm shift in the approach to sanitation from shame and disgust to pride and dignity. Social marketing and brand ambassadors for sustainable sanitation promotion would be initiated. The adoption of good sanitation practices would become an indicator of economic well-being.

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