

Aspects of Waste Management in Rural Areas in Mayiladuthurai District –A Micro Level Analysis

B.SUMATHI

*Ph.D. Scholar in Economics, AVC College (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli),
Mayiladuthurai- 609 305*

Dr. R.KARTHIKEYAN

*Associate Professor of Economics, AVC College (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli),
Mayiladuthurai- 609 305*

Dr. S.SARANYADEVI

*Assistant Professor of Economics, AVC College (Autonomous), (Affiliated to Bharathidasan University, Tiruchirappalli),
Mayiladuthurai- 609 305*

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Abstract: Economic growth plays a crucial role for socio-economic development. However, economic development and environmental sustainability are not supplementary to each other. Sustained development is elusive without sustainable environment, especially for developing countries like India where a large section of the society depends on natural resources for livelihood, directly or indirectly (Dasgupta, 2001). Unlike developed countries, developing countries do not have adequate financial resources to tackle the problem of natural resource depletion or degradation. Hence, it is imperative that developing countries should protect their natural resources, rather than searching for solutions after depletion and degradation. Environmental management focuses on the improvement of human welfare for present and future generation. Environment Management which is closely corroborated with the use of resources; overcoming environment and ecology crisis; sustainable development; economic need and values; reducing the incidence of disasters; and deciding the limiting line between environment and development. The activities of individuals have major environmental consequences in the aggregate. Consequently there can be major environmental effects from change in the behavior of individuals and households. This micro level study makes an attempt to study the aspects of waste management and its problems and practices among rural people of Mayiladuthurai district in Tamil Nadu state. This study suggested that special package of environmental awareness should be given especially for the socially deprived communities in the study area. Further, it is also suggested that proper environmental education measures to be extended to the rural people. Since the present study area is located near by the town area the service organizations of the town area. Such as (Lions Club and Junior Jaycees Chamber of Commerce (Mayiladuthurai, Vaitheeswarankoil, Seerkazhi and Kumbakonam) have to come forward to create awareness among the study area of people. It is noted that in the study area there have been a number of self-help groups functioning effectively and hence the awareness may be created to and through the self-help group in the study area.

Key Words: Rural Environment; Solid Waste Management; Waste Collection; Waste Storage; Waste Collection; Swachh Bharat Mission.

Introduction

Economic growth plays a crucial role for socio-economic development. However, economic development and environmental sustainability are not supplementary to each other. Sustained development is elusive without sustainable environment, especially for developing countries like India where a large section of the society depends on natural resources for livelihood, directly or indirectly (Dasgupta, 2001). Unlike developed countries, developing countries do not have adequate financial resources to tackle the problem of natural resource depletion or degradation. Hence, it is imperative that developing countries should protect their natural resources, rather than searching for solutions after depletion and degradation. The natural resource degradation, if not checked, will result in large-scale poverty and destitution, and can hamper the very process of socio-economic development of the populace (Agarwal, 1995; Nadkarni, 2000). The major environmental challenges in India are the pollution, The Loss of Natural Resources, Ecosystems and Biodiversity, problems in Coastal Zone Management, Poor Environmental Governance, Weakening Environmental Health, Adverse climatic Changes, etc. The pollution - Water, Land, Air and Solid Wastes contamination associated with growth are increasing exponentially. Rapid investment in the manufacturing sector that includes 17 highly polluting industries that are on the Central Pollution Control Board's "Red List", has fuelled this growth. The share of the most polluting sectors in India's exports has increased dramatically during the last decade suggesting that India could be emerging as a net exporter of pollution-intensive commodities. These trends indicate the need for greater investment in environmental management. Pollution is a serious problem that badly affects the entire earth and living organisms including man. Major source of pollutants are combustion of fuels, industrial waters, dust, mist, smoke, fog, fumes, and many others. Major conditions for life to exist, air and water are polluted in one side and huge waste are generated on the other side in an unimaginable way in developing country like India, where rich are the richest and poor are the poorest; pollution is a threat for our existence.

In this highly populated country we must accept that industrialization and modernization are inevitable. At the same time, we must remember that problems due to pollution are result of lack of care and ignorance. Resolution of this immense problem, thus become the most serious in our country. In India, 53% of households or 600 million people defecate in open, out of which 69.3% belongs to rural areas and 18.6% belongs to urban areas. This unhygienic practice was one of the reasons for high prevalence of diarrhoea diseases and helminthic diseases in the country. Addressing sanitation issue is the need of the hour which not only helps in reducing the burden of the communicable diseases like diarrhoea but also provides the scope for Gross Domestic Product growth, reduction in health care costs, and a source of employment. Swachh Bharat Abhiyan was launched with basic objective to create sanitation facilities for all and eliminate completely the unhealthy practice of open defecation. It is a national campaign launched by our Hon. Prime Minister on October 2, 2014 to have clean streets, roads and infrastructure in the country. Sanitation has been identified as one of the important determinants of the health since ages. Father of the nation M.K Gandhi stated that "Sanitation is more important than Independence" and dreamt about clean India. It is a known fact that community participation is very much essential for the success of any health related campaigns. To ensure adequate participation, community must be sensitised about the mission objectives and its role in bringing the desired change. Government has been aggressively promoting Swachh Bharat Abhiyan through mass media to motivate people for their active participation. With this background, this study was undertaken on the aspects of waste management and its problems and practices regarding Swachh Bharat Mission among rural people of Mayiladuthurai district in Tamil Nadu state

Literatures

So far a number of researches made on various aspects of environmental issues and management strategies such as Graff et al. (1998), Dhussa and Tiwari (2000), Gray and Bebbington (2001), Patil and Shekdar (2001), Sudhakar Yedha and Jyotik.Parikh (2001), MukeshYadav (2001), Patil and Shekdar (2001), Sudhakar Yedha and Jyoti K. Parikh (2001), Rao et al., (2002), Mohanasundaram (2003), Vesana.K, A. Sharp and N.H. Harnpornchai (2004), Agarwal A., K. K. Sahu and B.D. Pandey (2004), Kumarasamy, K (2004), Agarwal, A., A. Singhmar (2005),Misra. V. and S.D. Pandey (2005), Daisy Das and Mohammad Wahid Murad (2007), Pandit and Choudhary (2008),Manimozhi. et. al (2009), Jyoti P. Patil.,(2009),Vijai Kumar Agarwal (2010), Matthies, et al. (2012), Iyer and Steele,(2015), 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), Bhaskar Tripathi (2019), Sarkar S.K. (2019), Sivasubramaniyan K. and S. Rajendran. (2019), Dinesh Raj Bandela, (2020), Soumya Bhowmick, Nilanjan Ghosh and Roshan Saha, (2020) to mention a few.

Objectives, Materials and Methods

The present paper mainly tries to analyse the aspects waste management and its problems in rural areas. However, the specific objectives are to study the Socio Economic Background of the respondents; to analyse the methods and problems in the Waste Collection, Storing and Disposal; to suggest possible strategies for effective management of wastes in rural areas.

To fulfill these objectives, the required data have been gathered through primary sources directly from the selected respondents. The multi stage random sampling technique was adopted. In the first stage the Mayiladuthurai District was chosen as it is recently incepted district of Tamil Nadu; followed by in the districts among the villages, three villages which are having maximum size of population were chosen and then 30 sample household from each village were selected randomly selected for data collection.

Analysis and Discussion

The collected data from the selected respondents of the study area have been processed, tabulated and analysed.

In the present study to know the social profile of the respondents the common social indicators such as Religion, Community, Gender, Age, Marital status, Family size and type have been taken for analysis. It is found that among the respondents 90% are the Hindu, and remaining 10% of the Muslim; 50% are SC, 30% are MBC, 20% are BC; with regard to gender distribution 68% are male 32% are female households; the Age distribution witnessed that 75% are under the age group of 25 - 45. Followed by 19% are under the age group of 45 - 65 and each 3 % are in the category of the age below 25 and above 65. All the respondents have got married; regarding the family size, the group 4-5, accounts to 54% followed by the households consists of the family members' above 5 accounts to 10%. It also found that the number of family members below 3 accounts to 36% of the respondents. Among them still 30% of the respondents live in joint family.

Table 1 Social Profile of the respondents Distribution

S. No	Particulars	No	%	S. No	Particulars	No	%
1	Sex			5	Marital Status		
	Male	61	68		Married	90	100
	Female	29	32				
2	Religion			6	Family type		
	Hindu	81	90		Nuclear	63	70
	Muslim	9	10		Joint Family	27	30
3	Community			7	Family size		
	SC/ ST	45	50		Up to 3	32	36
	MBC	27	30		4 - 5	49	54
	BC	18	20		Above 5	9	10
4	Age						
	Below 25	3	3				
	25 - 45	68	75				
	45 - 65	17	19				
	Above 65	2	3				

The economic profile of the present study as considered the basic economic indicators income, expenditure, savings, Assets, borrowings etc. it is found that about 45% of the household as belongs to the monthly income group Rs 5000 - 10000 followed by 33% of the households belongs to the monthly income is above Rs 10000 and only 3% of the households monthly income is less than Rs 5000. Similarly in the case of households expenditure 43% of the respondents spent less than Rs 50000 per annum have a spent the amount in the range of Rs 50000 - 100000 and only 17% of the respondents have a spent above 1.5 lacks as household expenditure per annum. It is appreciable to note that all the respondents have saved in any one form it is a sticking future that 23 % of household have save more than Rs 100000 and 71 % of the household saved less than Rs 50000 in one side and all the respondents invariably are indebted in one way or other. With regard to the asset holding position of the sample household expect 23% of household the other entire are positioning the asset valued above Rs 5 lacks, of them 10% of household owned the assets valued above 15 lacks.

Table 2 Economic Profile of the respondents Distribution

S. No	Particulars	No	%	S No	Particulars	No	%
1	Monthly Income			5	Savings		
	Below 5000	20	22		Below 50000	64	71
	5000 - 10000	40	45		50000 - 100000	21	23
	Above 10000	30	33	100000 - 200000	3	3	
				Above 200000	2	3	
2	Food Expenditure			6	Indebtedness		
	Below 25000	3	3		Below 50000	39	43
	25000 - 50000	12	14		50000 - 100000	30	33
	50000 - 100000	72	80		100000 - 500000	15	17
	Above 100000	3	3	Above 150000	6	7	
3	Non - Food Expenditure			7	Assets Position		
	Below 15000	20	22		Below 500000	21	23
	15000 - 25000	51	60		500000 - 1000000	33	37
	25000 - 50000	14	16		1000000 - 1500000	27	30
	Above 50000	5	5	1500000 Above	9	10	
4	Total Expenditure						
	Below 50000	39	43				
	50000 - 100000	30	33				
	100000 - 150000	15	17				
	Above 150000	6	7				

The opinions of the respondents about the extent of major environmental problems in the study villages found that among the 6 major environmental related problem such as polluted water, air, up normal noise, solid waste generation poor drainage and soil pollution, the overall observation reflected that nearly 1/3 of the respondents were unable to say anything, around 25% of the respondent were of opinion that there are no environmental problems and remaining almost 50% of the respondents only were of opinion that the environment is polluted in their villages. With regard to the opinion of the respondent about the quality of water 48% were observed that the water is polluted and 25% were of opinion that the water is not at all polluted in the area, and remaining 27% were indifferent. Similarly the respondents released the incidents of polluted air accounts to 44% and it is 56%, 40%, 38% 21% about the noise level solid waste poor drainage and soil pollution respectively further it is noticed that 42% of the respondents were of opinion that there is no problem in the drainage facility in it is 27%, 25%, 23%, 18%, and 16% for soil pollution water quality air quality, sound quality and soil waste generation respectively. It is also understood from the table that the maximum of 52% of the respondents were unable to identify that whether the soil pollution is found in the area are not and it was 42%, 33%, 28%, 27% and 20% in the case of noise problems air problems soil waste generation water quality and drainage problem respectively.

Table 3. Major Environmental Problem Distribution

S. No	Problems	No. of the Respondents					
		Yes		No		Don't Know	
		Nos	%	Nos	%	Nos	%
1	Polluted Water	43	48	23	25	24	27
2	Polluted Air	39	44	20	23	31	33
3	Abnormal Noise	36	40	16	18	38	42
4	Solid Wastes	51	56	14	16	25	28
5	Poor Drainage Facilities	34	38	38	42	18	20
6	Soil Erosion & Pollution	19	21	24	27	46	52

Table 4. Source – Wise Wastes Disposal Distribution

S. No	Particulars	No. of Respondents	Percentage
1	Plastic	59	63
2	Paper	77	84
3	Tin	15	17
4	Glass	15	17
5	Kitchen waste	90	100
6	Polythene	31	33
7	Others	9	10

The sources of solid wastes are the major element of environmental problem not only in urban areas but also in rural areas. Hence the source of disposal of solid wastes of the selected respondents is the displayed and it is observed that among the different forms of solid wastes all the respondents have disposed their kitchen wastes, for 84% of the respondents the paper wastes place the major quantity of solid waste disposed of and the plastic waste place as the major source for 63% of the respondents further it is noted that 17% of the respondents have disposed tin and glass waste while 33% of the respondents have disposed polythene waste also for this analysis it is obviously observed that through the study areas is villages were the plastic paper, tin, glass, polythene and kitchen waste are disposed of regularly.

Table 5. Mode of Storing of Wastes Distribution

S. No	Particulars	No. of the Respondents			
		Inside the Home		Outside the Home	
		Nos	%	Nos	%
1	Plastic Wastes	43	48	23	25
2	Paper Wastes	39	43	51	57
3	Tin Wastes	18	20	72	80
4	Glass Wastes	6	7	84	93
5	Kitchen Wastes	3	3	87	97
6	Polythene Wastes	19	21	71	79
7	Other Wastes	3	3	87	97

It was seen that the mode of storing of tin waste distributed in this study areas by the sample respondents, the most of the respondents 80% (72) have stored their tin waste into outside the home and remaining only 20% of them (18) have stored their tin waste inside of their home of the study areas.

With regard to storing of paper wastes it is clearly observed that 51 respondents (57%) have stored their paper waste into outside the home and remaining 43% of the respondents have stored their paper waste inside of their home; 93% of the respondents (84) have stored their glass wastes into outside the home and only 7% the respondents have stored their glass waste inside of their home.

Details regarding the mode of storing of kitchen waste distribution in the study areas revealed that the maximum 97% of the respondents (87) have stored their kitchen waste into outside the home and only 3% of the respondents (3) have stored their wastes in to inside of the their home.

Table 6. Methods of Disposal of Wastes Distribution

S.No	Particulars	Plastic		Paper		Tin		Glass		Kitchen Waste		Polythene		Others	
		R	%	R	%	R	%	R	%	R	%	R	%	R	%
1	Dust bin	15	17	19	20	3	4	2	3	37	40	3	3	4	4
2	Own manure pit	2	3	16	17	3	4	-	-	3	3	4	4	5	5
3	Thrown it in Backyard	24	27	22	23	47	52	70	78	31	33	19	20	15	17
4	Common garbage pit	19	20	5	5	2	3	3	3	3	3	3	3	15	17
5	Poplic place	5	5	3	3	3	3	6	7	9	10	3	3	3	3
6	Panchayat garbage bin	16	18	19	20	15	17	16	18	34	37	50	53	40	43
7	Waste collection vehicles	50	53	25	26	6	7	15	17	24	27	31	27	25	27
8	Burn it	34	37	40	43	-	-	-	-	3	3	25	27	6	7

The source wise disposal of the waste papers of the household revealed that there are 8 sources are used to dispose the solid wastes viz; dustbin, own manure pit, thrown in to backyard, common garbage pit, public place, panchayat garbage bin, burning and waste collection vehicles it is observed that 43% of the respondents (40) have burnt most of their wastes; 23% of the respondents (22) have simply thrown in to the backyard; 20% of the respondents have the practice of disposal of the paper wastes into their own dustbin and panchayat garbage bin while 26% of the households (25) have disposed their paper wastes into collection vehicle of the village panchayat.

It is known from the survey that disposal of the tin waste that 52% (47) have thrown most of their wastes in backyard; 17% (15) have thrown into panchayat garbage bin; only 7% of the (6) have the practice of disposal of the tin waste into their waste collection vehicles ; it is noted that the next level 4% (3) have disposed their tin waste into dust bin; while only 3% (3) of them have used their own manure pit , common garbage pit and public place in the study area.

It was also observed that the source wise disposal of the glass wastes, Maximum 78% of the respondents (70) have thrown it in backyard; 18% of the respondents (16) in panchayat garbage bin; 17% of the respondents (15) have the practice of disposal of the glass waste into their waste collection vehicles; 3% of the respondents (3) have disposed their glass waste into dust bin, common garbage pit of the village panchayat.

With regard to kitchen wastes it is observed that 40% of the respondents (37) have disposed of it into dust bin; 37 % of the respondents (34) have used panchayat garbage bin; 33% of the respondent (31) have simply thrown it in the backyard; 27% of the respondents have (24) the practice of disposal of the kitchen waste into their own manure pit, common garbage pit and burnt.

It is also noted that 53% of the respondents have used the panchayat garbage bin to disposing their polythene wastes; 33% of the respondents have disposed in the waste collection vehicle; 27% have burnt most of their polythene waste; and only 20% of the informant have thrown it in backyard and 4% of the respondents have used their own manure pit to disposing their polythene wastes. It is also noted that only the lowest percentage i.e 3% of the respondents have used the common garbage pit, dust bin and open place area to throw the polythene wastes. It is also known that there are so many sources are used to dispose the other form of solid wastes. And it is observed that 17% of the respondents (15) have thrown their wastes in backyard and common garbage pits: 5% of the respondents (4) have thrown simply in their own manure pit; 4% of the respondents have the practice of disposing into their dustbin while only 3% of the respondents (4) have disposed the other wastes into open place of the study areas

Table 7. Extent of Problems in Waste Collection, Waste Storing and Waste Disposal Distribution

S. No	Particulars	Waste Collection	Waste Storing	Waste Disposal
		No. of Respondents	No. of Respondents	No. of Respondents
1	Highest Level	5 (5)	6(7)	2 (2)
2	High Level	8 (9)	7(8)	3 (3)
3	Moderate Level	11(12)	9 (10)	9 (10)
4	Low Level	7 (7)	13 (15)	13(14)
5	No Problem	59(67)	55(60)	65(71)
TOTAL		90 (100)	90 (100)	90 (100)

There are so many problems faced by the households in the waste management and environment management in the rural areas. It is found that the sample households are facing problems in the collection, storage and disposal of the wastes. With regard to the waste collection, it is found that 67% of the households have not faced any problems in the waste collection, among the rest of 33% of the households 9% are of opinion that the waste collection is the high problem to them and it is highest to 5% and it is moderate to 12% and 7% have considered that the problems in the wastes collection is low.

Problems in the Storage of Wastes inferred that 60% of the households have not faced any problems in the waste storing, among others 15% have faced Low level of problems, 10% are of opinion that it is moderate level and 8% of the respondents felt that the problems is at high level while 7% of the households considered that the incidence of problems in the Storing is at the highest level. Similarly, 71% of the households have not faced any problems in the waste disposal, among the rest of the 29%, 14% of the households have faced problems at low level, 10% of the households have faced

moderate level problems and 3% of the households are opinion that there are high level problems in the disposal of wastes and it is the highest level to 2% of the households in the study areas.

Conclusion

Though the Eleventh Schedule of Panchayat Raj portrays the environment protection and improvement and which ensures to create will and determination among the rural people to protect and improve the environment; to understand the local situation and to share the information about environment; to achieve integrated approach by co-coordinating the activities of various agencies interested in environment protection rural areas; to provide an open forum for discussion on environment protection; to give guidance and training to rural people; and to restrain the people from those activities which are harmful to environment, if necessary by imposing penalty and fine, still all of the rural people are not fully awarded on the issues relating to environment. It suggested that special package of environmental awareness should be given especially for the socially deprived communities in the study area. Further, it is also suggested that proper environmental education measures to be extended to the rural people. Since the present study area is located near by the town area the service organizations of the town area. Such as (Lions Club and Junior Jaycees Chamber of Commerce (Mayiladuthuai, Vaitheeswarankoil, Seerkazhi and Kumbakonam) have to come forward to create awareness among the study area of people. It is noted that in the study area there have been a number of self-help groups functioning effectively and hence the awareness may be created to and through the self-help group in the study area. Further, the village Panchayat administration should concentrate on creation of environmental awareness to safeguard the environment as especial project of it in addition to allocation of adequate fund. Further, the awareness can also be created through the local area Audio and Video aids. It is essential to organize the seminars, conferences and symposia, etc., to produce literature and making use of various mass media in various fields to create environmental awareness in rural areas.

The Environmental Protection Strategy should be targeted links with the socio-economic development sectors including, agriculture, forestry, fisheries and rural economy, infrastructure and services. The development of these industries is necessarily interlinked. Further, agriculture, forestry and the rural economy have to be identified as a priority for the improvement of environmental quality in rural areas. The development of these sectors will contribute to changes in economic structures and thus have strong and positive impacts on the environment. Environmental protection strategies should also pay due attention to environmental interactions with surrounding areas regional capacity to address environment-related issues, people's perception and associated cultural and environmental customs and options to implement the regional strategies for enhancing the quality of rural environment.

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