



Demographic Profile of Rag Pickers and Solid Waste Management: A Study in View of Environmental Pollution in Puducherry

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ABSTRACT

The fastest developing country with an increasing population will lead to urbanization that will conceive higher municipal solid waste. The informal waste collector called as Kabadiwala, Raddiwalas, and bhangar walas. The informal waste collection will forge odor, diseases, and health issues—most of the houses due to urbanization near the dumping yard. Rag pickers are the people who contribute to solid waste management. Rag pickers sustain and earn themselves by collecting, sorting, and segregating waste and trading it. They are staying near the bus stand and railway station. Most of the dumping yards use rag pickers to burring the trash. It may lead to the health issue of rag pickers. In this society, they have considered non-recognized people. The present paper focuses on attempt the socio-economic condition of rag pickers, the standard of living and vulnerability, and health ailments of the rag pickers at dump yards. The study was carried out in Puducherry city of Pondicherry union territory, one among the fastest developing city in India but still plagued with the problem of solid waste management, and the rag pickers' livelihood also affected in that city. Hence, the study shows the demographic profile and rag pickers and suggests the best options to improve their standard of living and employment opportunities.

Key Words: Standard of living, Poverty, Rag Pickers

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INTRODUCTION

In developing countries, the problem of solid waste has an important dimension, especially in the urban centers compared to rural ones, because of more working sectors present on the urban side, so most of the people were migrate into the urban side so the migration also one of the reasons for increasing the solid waste. Domestic waste, Industrial waste, and non-residential waste, whether high or low or medium-level, have become a hilarious problems. This will leads to the continuation of causing environmental pollution and degradation. Improper waste management systems arise with a hot climatic conditions resulting in increasing environmental problems with significant local and global dimensions. India has the second-largest country globally, so urbanization is also increasing, leading to a higher generation of solid waste. Due to open dumping, dumping in the low-lying areas and transiting the waste in the open will cause air pollution, odor, etc. The hours are needed to devise an efficient solid waste management system through the decision-makers and 'waste management planners can deal with the higher complexity, uncertainty, multi- objectivity, and subjectivity associated with this problem. Despite the increasing stress on the waste, reduction at source and recovery and recycling of the solid waste through landfills are again the most commonly employed method. Landfills incorporate an engineered method of solid waste disposal on land to reduce environmental hazards by spreading the solid waste in these layers, compacting the solid waste to a small practical volume, and applying a cover at the end of the day. However, with the higher population density and urban infrastructure, several keys must be considered to ensure its overall sustainability to reduce the degradation of environmental quality due to open dumping and to reduce short long-term problems related to waste disposal. There should identify suitable landfill sites for the proper disposal of solid waste. Sanitary landfilling involves various stages such as selecting the site, planning for the landfill operation and construction of the place as per plan and closure of the site, and environmental monitoring. Site selection is the best and most important one as it forms the basis for the remaining stages. The rag pickers are mostly engaged in solid waste practice and help the surroundings and environment be clean in informal waste collection methods. **The rag pickers' standard of living was not good** [5]. This paper highlights the demographic profile of rag pickers and suggests the best option for efficient solid waste management practice.

OBJECTIVES

The objectives of the present study in this paper are as follow:

1. To focus on the demographic profile of rag pickers in Puducherry.
2. To examine the solid waste management practice and suggest the best options for improving solid waste management in Puducherry.



RESEARCH METHODOLOGY

In India, Pondicherry is one of the developing city overall Pondicherry union territory and is located near at the longitude of 79.817655 and latitude of 11.927655. Among the three regions of the Puducherry district, Puducherry is the largest region, with a total geographical area of 290 sq. km. It lies along the east coast of southern India, bounded by the state of Tamil Nadu, and consists of 12 scattered areas lying between 11.42 to 12.30 North and 76.36' to 79.53 East [1]. The primary solid waste dumping yard was presented in the Kurumbapet, and it's located at the longitude of 79.752877 and latitude of 11.927630. The distance between Pondicherry and to dumping yard there is 7 Km, and it was located on the west side of Puducherry, and it was the present Puducherry area Tamil Nadu border. In between the transit waste to dumping yard there is the way main road and traffic area there are open waste transits will create odor and mosquitoes and files always present. The data for solid waste management were taken from the secondary source, and the rag pickers' data were taken from the primary source. The primary data was collected by the formation of the questionnaire and interviewing the rag pickers directly. They are 50 samples taken, and 50 of them were respondents to the questions. In addition, the database was entered into SPSS software, and a random sampling method was used in the study. Secondary data for solid waste management was taken from the Central pollution control board (CPCB, 2019-2020).

ANALYSIS

Table 1: Cross tabulation of Family Size of Rag Pickers and their Per day Income					
Family Size	Per day Income of Rag Pickers				Total
	Rs.100 Rs.300	Rs.301 Rs.600	Rs.601- 800	Rs.801-1000	
2-3Members	11 (84.6%) [26.8%]	0 (0.0%) 0.0%	1 (7.7%) 100.0%	1 (7.7%) 33.3%	13 (100.0%) 26.0%
4- 5Members	23 88.5% [56.1%]	3 11.5% 60.0%	0 0.0% 0.0%	0 0.0% 0.0%	26 100.0% 52.0%
6-8Members	1 50.0% [2.4%]	1 50.0% 20.0%	0 0.0% 0.0%	0 0.0% 0.0%	2 100.0% 4.0%
1 member	6 66.7% [14.6%]	1 11.1% 20.0%	0 0.0% 0.0%	2 22.2% 66.7%	9 100.0% 18.0%



	41	5	1	3	50
Total	82.0%	10.0%	2.0%	6.0%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%

From the above table 1 represent the family size of the rag pickers and per day income of the rag pickers and it is evident that rag pickers having 1 member to upto 8 members in their family but not attach with their family because of family issues, financial issues and orphan. There are 13 rag pickers of family having 2 to 3 members in the family and earning 100 - 300, 601 - 800, 801- 1000 rupees per day. There are 26 rag pickers of family having 4 – 5 members in the family and earning 100 - 300 and 301 - 600 rupees per day. There are 2 rag pickers are having 6 - 8 members in the family and earning 100 - 300 and 301 - 600. There are 9 rag pickers are belongs to orphan and earning 100 - 300, 301 - 600, 801 - 1000.

Table 2: Cross tabulation of health condition of rag pickers and where they get treatment				
Health Condition of Rag Pickers	Where do you get Treatment?			
	Self Medication	Government Hospital	Private hospitals	Total
Injury	0 0.00% [0.0%]	8 -100.00% 16.70%	0 0.00% 0.00%	8 -100.00% 16.00%
Asthuma	0 0.00% [0.0%]	3 75.00% 6.30%	1 25.00% 100.00%	4 100.00% 8.00%
Dog Bite	0 0.00% [0.0%]	1 100.00% 2.10%	0 0.00% 0.00%	1 100.00% 2.00%
No Health Issues	1 2.70% [100.0%]	36 97.30% 75.00%	0 0.00% 0.00%	37 100.00% 74.00%
Total	1 2.00% 100.00%	48 96.00% 100.00%	1 2.00% 100.00%	50 100.00% 100.00%



From the above table 2 represents the health conditions of rag pickers and where they get treatment and it is evident that 8 members of the rag pickers are suffered from injury and taking treatment from government hospitals, 4 members of the rag pickers are suffered from Asthuma and taking treatment from government hospitals and only few getting treatment from private hospitals, only one rag pickers suffered from dog bite and getting treatment from government hospitals. There are 37 members of the rag pickers are having no health issues.

Table 3: Cross Tabulation of Age of Rag Pickers and working Hours of rag pickers			
Age of Rag Pickers	Working Hours of Rag Pickers		
	5 Hours -10 Hours	10 Hours-15 Hours	Total
25-35	11 100.0% (22.4%)	0 0.0% (0.0%)	11 100.0% (22.0%)
36-45	16 100.0% [32.7%]	0 0.0% 0.0%	16 100.0% 32.0%
46-55	14 100.0% [28.6%]	0 0.0% 0.0%	14 100.0% 28.0%
56-65	5 83.3% [10.2%]	1 16.7% 100.0%	6 100.0% 12.0%
66-75	3 100.0% [6.1%]	0 0.0% 0.0%	3 100.0% 6.0%
Total	49 98.0% 100.0%	1 2.0% 100.0%	50 100.0% 100.0%

From the above table 3 shows the age and working hours of rag pickers and it is evident that there are there are 11 rag pickers were working 5 to 10 hours from the age group between 25 to 35, there are 16 rag pickers belong to the age category of 36 to 45 and working 5 to 10 hours, there are 14 rag pickers were the age group between 46 to 55 and working 5 to 10 hours, there are 6 rag pickers between the age group of 56 to 65 and working 5 to 10 hours, only one rag



pickers from this age group working 10 to 15 hours because of availability of waste from the dustbins. There are 3 rag pickers between the age group of 66 to 75 and working 5 to 10 hours. However the rag pickers are working more hours but they will get only lower wage because of availability of waste and income was based on the scraps and quantity of scrap.

Table 4: Cross Tabulation of age of rag pickers and years of work experience in rag picking

Age of Rag Pickers	Years of Work Experience of Rig Pickers				
	Less than 5 Years	6 -10 Years	11- 20	More than 20	Total
25-35	11 (100.0%) [100.0%]	0 (0.0%) 0.0%	0 (0.0%) 0.0%	0 (0.0%) 0.0%	11 (100.0%) 22.0%
36-45	0 0.0% [0.0%]	11 68.8% 78.6%	5 31.3% 23.8%	0 0.0% 0.0%	16 100.0% 32.0%
46-55	0 0.0% [0.0%]	3 21.4% 21.4%	11 78.6% 52.4%	0 0.0% 0.0%	14 100.0% 28.0%
56-65	0 0.0% [0.0%]	0 0.0% 0.0%	5 83.3% 23.8%	1 16.7% 25.0%	6 100.0% 12.0%
66-75	0 0.0% [0.0%]	0 0.0% 0.0%	0 0.0% 0.0%	3 100.0% 75.0%	3 100.0% 6.0%
Total	11 22.0% 100.0%	14 28.0% 100.0%	21 42.0% 100.0%	4 8.0% 100.0%	50 100.0% 100.0%

From the above table 4 represents the age of rag pickers and work experience of rag pickers and it is evident that there are 11 rag pickers are belongs to age group between 25 to 35 and



having work experience less than 5 years, there are 16 rag pickers are belongs to the age group between 36 to 45 and having work experience 6 to 10 years, 11 to 20 years. There are 14 rag pickers are belong to the age category of 46 to 55 and having work experience of 6 to 10 years and 11 to 20 years. There are 6 rag pickers are belong to the age category of 56 – 65 and having work experience 11 to 20 hours and only one rag picker in this age group are working more than 20 hours because of sleeplessness and lesser wage. There are 3 members belongs to the age category of 65 to 75 and having work experience 3, in this age group are working more than 20 hours because of sleeplessness, lesser wage, availability of waste, Distance for enchanting the waste by walking is also one among the reason for working high number of hours.

Table 5: Cross Tabulation of native place and migration of rag pickers

Native place of Rag Pickers	Migration of Rag Pickers		Total
	Yes	No	
Rural	17 (100.0%) [37.8%]	0 (0.0%) 0.0%	17 (100.0%) 34.0%
Urban	19 82.6% [42.2%]	4 17.4% 80.0%	23 100.0% 46.0%
Semi-Urban	9 90.0% [20.0%]	1 10.0% 20.0%	10 100.0% 20.0%
Total	45 90.0% 100.0%	5 10.0% 100.0%	50 100.0% 100.0%

From the above table 5 represents the native place of rag pickers and migration of rag pickers from various part of cities in India. There are 17 rag pickers are belongs to rural from different parts of india and migrated into Puducherry because of lack employment and financial burden, 23 rag pickers are belongs to the urban and 19 rag pickers are only migrated form various part of india and rest of the 4 rag pickers are belongs to the Puducherry and the people were migrated to Puducherry because of family issues, financial burden, working conditions, Orphan. There are 10 members belongs to the semi urban places and 9 rag pickers were migrated from different part of cities and rest of the only 1 rag pickers are belong to Puducherry.

Table 6: Cross tabulation of Age of Rag Pickers * Quantity of Waste Collected by Rag Pickers



Age of Rag Picker	Amount of Waste Collected by Rag Pickers							Total
	Less than 5Kg	5.1-10 Kg	10.1-15Kg	15.1-20 Kg	20.1-25 Kg	25.1-35 Kg	Above 35 Kg	
25-35	2 (18.2%) [33.3%]	2 (18.2%) 18.2%	4 (36.4%) 23.5%	0 (0.0%) 0.0%	0 (0.0%) 0.0%	3 (27.3%) 50.0%	0 (0.0%) 0.0%	11 (100.0%) 22.0%
36-45	2 12.5% [33.3%]	3 18.8% 27.3%	4 25.0% 23.5%	1 6.3% 50.0%	4 25.0% 80.0%	1 6.3% 16.7%	1 6.3% 33.3%	16 100.0% 32.0%
46-55	0 0.0% [0.0%]	2 14.3% 18.2%	6 42.9% 35.3%	1 7.1% 50.0%	1 7.1% 20.0%	2 14.3% 33.3%	2 14.3% 66.7%	14 100.0% 28.0%
56-65	1 16.7% [16.7%]	3 50.0% 27.3%	2 33.3% 11.8%	0 0.0% 0.0%	0 0.0% 0.0%	0 0.0% 0.0%	0 0.0% 0.0%	6 100.0% 12.0%
66-75	1 33.3% [16.7%]	1 33.3% 9.1%	1 33.3% 5.9%	0 0.0% 0.0%	0 0.0% 0.0%	0 0.0% 0.0%	0 0.0% 0.0%	3 100.0% 6.0%
Total	6 12.0% 100.0%	11 22.0% 100.0%	17 34.0% 100.0%	2 4.0% 100.0%	5 10.0% 100.0%	6 12.0% 100.0%	3 6.0% 100.0%	50 100.0% 100.0%



From the above table 6 represents the age and quantity of waste collected by rag pickers. there are 11 rag pickers are belong to the age group of 25 – 35 and there are collecting waste from less than 5 kgs to 15 kg and only few of them collecting waste from 25.1 to 35 kg of waste, there are 16 rag pickers are belong to the age group of 36 – 45 and there are collecting waste from less than 5 kg to above 35 kg. There are 14 members are belongs to the age group of 46 – 55 collecting waste from 5 kg to more than 35 kg. There are 6 members are belong to the age category of 56 – 65 collecting waste from less than 5 kg to 10.1 – 15 kg. There are 3 rag pickers are belong to the age category of 66 to 75 and collecting waste from less than 5 kg to 15 kg.

Table 7: cross tabular Gender of Rag Pickers * Alcoholic Consumption of Rig Pickers		
Gender of Rag Pickers	Alcoholic Consumption of Rig Pickers (Yes)	Total
Male	48 (100.0%) [96.0%]	48 (100.0%) 96.0%
Female	2 100.0% [4.0%]	2 100.0% 4.0%
Total	50 100.0% 100.0%	50 100.0% 100.0%

From the above table 7 represents the gender and alcoholic consumption of rag pickers and it is evident that there are both female and male are engaged in the rag picking work, there are 48 rag pickers are belong to the male category and rest of the 2 members are only female, both male and female having alcoholic consumption because of working condition and to sustain the odor smell.

Table 8: cross tabular Expenditures of Alcohol * Expenditures of Food				
Expenditure of Alcohol	Expenditures of Food			Total
	Rs. 50-100	Rs. 101-150	151- 200	



Rs.60-100	1 (7.7%) [16.7%]	1 (7.7%) 14.3%	11 (84.6%) 29.7%	13 (100.0%) 26.0%
Rs.101 -300	5 15.2% [83.3%]	5 15.2% 71.4%	23 69.7% 62.2%	33 100.0% 66.0%
Rs.301-800	0 0.0% [0.0%]	1 25.0% 14.3%	3 75.0% 8.1%	4 100.0% 8.0%
Total	6 12.0% 100.0%	7 14.0% 100.0%	37 74.0% 100.0%	50 100.0% 100.0%

From the above table 8 represents the per day expenditure of alcohol and food expenditure of rag pickers and it is evident that the rag pickers having habit of alcohol consumption. Mostly the rag pickers were taking alcohol compare to the food. There are 13 members were spending for alcohol (minimum 60 rupees to maximum 100 rupees) and spending for food (minimum 50 rupees to maximum 200 rupees), there are 33 members were spending for alcohol (minimum 101 rupees to maximum 300 rupees) and spending for food (minimum 50 rupees to maximum 200 rupees), there are 4 members were spending for alcohol (minimum 301 rupees to maximum 800 rupees) and spending for food (minimum 101 rupees to maximum 200 rupees).

Educational Status of Rag Pickers	Table 9: Cross tabulation of Educational status Educational level of Rag Pickers				Total
	Less than 10	10th-12th	Diploma Courses	No education	
Yes	21 (55.3%) [100.0%]	16 (42.1%) 100.0%	1 (2.6%) 100.0%	0 (0.0%) 0.0%	38 (100.0%) 76.0%



No	0 0.0% [0.0%]	0 0.0% 0.0%	0 0.0% 0.0%	12 100.0% 100.0%	12 100.0% 24.0%
Total	21 42.0% 100.0%	16 32.0% 100.0%	1 2.0% 100.0%	12 24.0% 100.0%	50 100.0% 100.0%

From the above table 9 represents the rag pickers education and level of educational status and it is evident there are 38 members are literate and 21 rag pickers are studied upto less than 10th to 10th, 16 rag pickers were studied 10th to 12th, only one rag picker studies upto diploma course and only 12 members are illiterate. Both literate and illiterate rag pickers are not aware about their working conditions so the people may cause and affect by various health hazards. In this society most of people are not ready to take this people for any other job role and they will work under with any scrap dealers and their shop otherwise they will undergo with their own way of collecting scrap

Table 10 : Cross Tabulation of location of waste collection and types of waste collected

Location of waste collection	Type of Waste Collected by Rag Pickers				Total
	plastic, milk bag, pet bottle	cotton boxes, plastic	plastic bottle	plastic bottle, beer	
Offices, Market, Club side dustbins	1 (14.3%) [9.1%]	3 (42.9%) 14.3%	2 (28.6%) 16.7%	1 (14.3%) 16.7%	7 (100.0%) 14.0%
Railways	3 42.9% [27.3%]	3 42.9% 14.3%	1 14.3% 8.3%	0 0% 0%	7 100.0% 14.0%
Roadways	0 0% [0%]	2 100.0% 9.5%	0 0% 0%	0 0% 0%	2 100.0% 4.0%
	2	4	0	2	8



Dustbins	25.0% [18.2%]	50.0% 19.0%	0% 0%	25.0% 33.3%	100.0% 16.0%
Beach Side	1 33.3% [9.1%]	2 66.7% 9.5%	0 0% 0%	0 0% 0%	3 100.0% 6.0%
Bus stand	4 17.4% [36.4%]	7 30.4% 33.3%	9 39.1% 75.0%	3 13.0% 50.0%	23 100.0% 46.0%
Total	11 22.0% 100.0%	21 42.0% 100.0%	12 24.0% 100.0%	6 12.0% 100.0%	50 100.0% 100.0%

The above table 10 shows the location of waste collection and types of waste collected by rag pickers and the above table has been evident that the rag pickers collecting waste from roadside, Bustand, market, office, beachside, railway station side, club side dustbins. These are the main places to generate waste has higher and the rag pickers collect waste like plastic bags, cotton boxes, milk plastic covers, pet bottles and bear bottles. The rag pickers collect only particular waste and not all the waste.

Table 11: Cross Tabulation of Living condition of rag picker and gender of rag pickers			
Living Conditions of Rag pickers	Gender of Rag Pickers		Total
	Male	Female	
Road Side	46 (97.9%) [95.8%]	1 (2.1%) 50.0%	47 100.0% 94.0%
Railway station side	1 50.0% [2.1%]	1 50.0% 50.0%	2 100.0% 4.0%



Bus Stand	1 100.0% [2.1%]	0 .0% .0%	1 100.0% 2.0%
Total	48 96.0% 100.0%	2 4.0% 100.0%	50 100.0% 100.0%

The above table 11 represents the living condition and gender of rag pickers and it is evident that in the study area male rag pickers are higher than the female rag pickers. There are 47 rag pickers are stayed in the roadside both male and female. Only one female stayed in roadside and 46 male are stayed in the roadside. Few of them only stayed in the railway and bus stand side.

ired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Family Size of Rag Pickers & Living Conditions of Rag Pickers	1.24000	1.42227	.20114	.83579	1.64421	6.165	49	.000

The above table shows the result of paired sample test of the family size of rag pickers and their living condition of rag pickers, and it is evident that paired column represents the mean difference between the family size of rag pickers and living conditions of rag pickers with mean



value 1.24. The standard division of the differences is 1.42 and the standard error of the mean is 0.20114. The 95% confidence interval of the difference indicates that the true difference between the two variables is likely 0.83579 and 1.64421, the t value shows on 6.165 with the degree of freedom representing the 49 respondents and the significance value (p-value) is less than 0.001 which has been indicating that there is a true difference between the family size of rag pickers and living conditions of rag pickers. The rag pickers came out of the family because of financial crises, family issues, and orphans. The rag pickers are not attached to their family member. This rag picker resides near bus stands, roadsides, platforms, etc., and they don't have a proper place in the study area.

SOLID WASTE MANAGEMENT

Table 1: No. of Population and Total quantity of waste generation (TPD)

NAME OF THE MUNICIPALITY	TOTAL POPULATION AS PER CENSUS 2011	TOTAL QUANTITY WASTE GENERATION IN (TPD) TONS PER DAY
PUDUCHERRY	2,44,700	200
OULGARET	3,00,104	170

*Source of CPCB 2019-2020

From the above table, 1 represents the no. of population and total quantity of waste generation in Puducherry, and it is evident that the Local Administration Department mainly managed the solid waste through municipalities. According to CPCB in Puducherry, 270 tons of waste were generated total per day from Puducherry and Oulgaret from an overall population of 5, 44,804. Here it is identified mainly 10 wards; only waste has been appropriately segregated rest of the place is still collecting and transporting mixed waste. So without proper segregation and treatment of waste will cause methane gas higher and contaminate the soil in the dumping yard. The increasing population will leads to increase the solid waste generation higher and overflowing of waste will cause odor, foul smell, and also cause health impacts. In the dumping yard the rag pickers are utilized to burn the waste which will cause health impact of rag pickers.



Table 2: Urban Local Bodies

Urban local bodies	No. of wards	No. of households	Population	Solid waste generated Tons per day
Puducherry Municipality (PM)	33	60638	2,44,377	172
Oulgaret Municipality (OM)	42	90140	3,00,104	166

*Source from district environmental plan for Puducherry District 2021

From the above table represents the urban local bodies and it is evident that there are two urban local bodies municipality in Puducherry. One is Puducherry municipality and another one is Oulgaret municipality. These two municipality have 1, 50,778 households with total population of 5,44,481 and 338 tons per day of waste generations. It has been clearly shows that increasing population will leads to increasing solid waste generation has been higher and without proper treatment of solid waste will leads to environmental impact.

FINDINGS

- Improper solid waste management practice was to find out. The transits station between pondy to kurumbapet there is way is the main road and through the open transits cause odor.
- The main cities of Puducherry were cleaned, and hygiene rest of the rural area or city outer or roadside, river, and lakeside still solid waste management problem was present.
- Some of the municipality's street sweeper labor work on the need basis or daily wage (private- contract basis). So the lesser wage will reduce the interest of the labor that will lead to they will clean someplace and leaving some places. This is also one of the minor problems of improper solid waste management.
- Most of the rag pickers are also collecting the waste from the dustbins and segregating the waste recycled and unwanted waste. They take out the recycled waste for their earnings and through the unwanted waste are through somewhere this also one of the problems.
- Most of the people from the rag pickers migrated from various places in India, and the people migrated and came out from their families because of problems, work pressure, or orphanage. Very few of them are only not yet studied, and the rest of the people are educated.



- Both males and females are engaged in rag picking, and both are taking alcohol consumption and spending from a minimum of 60 to a maximum 800.
- The rag pickers living conditions were not good. They stayed on the roadside, railway platform, and bus stand platform.
- Some of the rag pickers have family members, but rag pickers are away from their family members because of family problems.
- The rag pickers collect various scarab like plastic bottles, aluminum, pet bottle, wine bottle, beer bottle, etc., and there are overall, 5 to 35 kg of waste was collected by themselves.
- Per day income of the rag pickers. Earning a minimum of 150 to a maximum of 800. The rag pickers have various health hazards like asthma, breathing problem, injury, dog bites, etc.
- They will get treatment from a government hospital, private hospitals, or by themselves. The rag pickers mostly collect the waste from dustbins, markets, and railways, roadside, clubs, beachside.
- During that vacation time, tourists will come more to Puducherry that time waste was generated highly so few of the rag pickers collecting the waste in beachside so they will get extra earning on that time.
- The rag pickers were spending for the food minimum of 50 rupees to a maximum of 200 rupees.
- The working hours of rag pickers startup are 5 hours to 10 hours and 10 hours to 15 hours.
- The rag pickers are using public toilets and bathrooms, and few of them noticed using the empty rummage side for the toilet.
- There is minimum age of 25 to maximum age of 75 between the age factors engaged in the rag-picking.

POLICY AND IMPLICATIONS

STEPS ADOPTED IN THE PRESENT STUDY:

The method was formed and suggested in the study has been two category. The primary category shows the environmental issues the present dumpsites and to different of the waste generated are also analyzed. Increasing the solid waste generation and improper waste management will leads to climate variations, infiltration the land due to lack of rainfall because of different climate variation and one more analyzing in the dumpsite area (the environmental pollution, checking the rainfall and groundwater quality and checking the rainfall and ground water quality and checking the air quality). In the second category usage of GIS for mapping the best place to practice a proper waste management.



PROPOSED ROUTING FOR WASTE TRANSPORTATION:

- The GIS (Geographic Information System) was digitalized for mapping and it helpful to show of traffic, volume, distance between transits place to dumpsites and it was determined using arc view of 3.3 version with help of network analyst. This may help to prevent from the improper waste management like. Adequate place to dump the waste and couldn't travel in the heavy traffic place, place wise waste generation identified and placed the one or two containers to collect waste.
- The Pondicherry to Oulgaret municipalities are 20.6 sq.km and 36.6 sq.km. to collect the waste from this places has need the vehicle requirement and management of the waste are also suggested.

EVALUATION OF SOLID WASTE MANAGEMENT OPTIONS:

- Based on the solid waste management problem of the inadequate dumpsite and types of solid waste manage with the available technology resource to overcome from the environmental pollution. The available technology are composting, vermi composting, Pyrolysis/ incineration through municipal waste generate the power and methane gas.
- According to (Central Pollution and Control Board 2020), Delhi is the first and most urbanized and highest waste generated city in India. The government handover the project to Timarpur Okhla Company. That company project was more efficient in minimizing the solid waste problem and converting 1950 M.T. of waste per day generated into 23MW energy. The Timarpur Okhla incineration waste project will suit for Puducherry to minimize the excessive waste and generate energy.

SUGGESTION FOR THE RAG PICKERS

Many of the rag pickers were surviving in the local bodies, urban, rural areas, and union territory. Measures to be promoted to make awareness of Rag Pickers. The rag pickers play an important role in the solid waste management system. There were various health hazards present and in the waste, more micro- bacterium, fungus, bacteria, etc., were present. The rag pickers don't bother about taking rags in the dustbins by hand without wearing masks and gloves. The government should be facilitated to give the rag pickers wear masks, gloves, sanitizer, etc., and arrange for a free medical camp for those who engaged in the waste collection. Most of the rag pickers are found on roadside railway stations etc., In Puducherry union territory, urban or local. The government should organize an organization for the rag pickers. The organization may be classified into ward wise and area wise. Through this organization, the government should help the rag pickers and attain their needs. Most of the women's and childrens (rag pickers) suffer a lot. If the government help them by (providing identity card, providing free education, employment, etc.) through this organization, their livelihood also change. Organizing and implementing these steps helps those to overcome from



their problem and their livelihood also change. It's not only for Puducherry but also suggested for all the states. Most of the cities and Puducherry also have organization, but still, the Problem was running on, and few of the rag pickers were unaware of the present organization. So the government should give some pressure or form a new organization and help them. They are also part of society, and helping the environment should be clean and hygienic, so treat them in a respectful manner. Still, some of the rag pickers through the unwanted waste on the road, so the government, through the organization, give awareness to the rag pickers couldn't through the unwanted waste. One of the best developing cities in Puducherry, and having this Problem will show a negative impact on the city. If suppose the government takes the necessary steps to overcome that will help to develop the city.

CONCLUSION

Waste management means the collection, removal, processing, and disposal of waste (Ecolife Dictionary). This study mainly highlighted challenges and problems faced by rag pickers. The government of Puducherry union territory takes an immediate and necessary steps to provide more facilities for the rag pickers. The rag-pickers should know of their working condition and environment due to the safety and security of life. When considered, the solid waste management system is still plagued with problems. The main cities of Puducherry are much cleaned, and hygiene still rest of the rural side area and outer cities are facing the problems. Improper waste management is still present, so the government should consider the severe problem of solid waste management and employ more people to clear the waste properly, and the government implements the best projects (technology for waste into power generation) to improvise and maintain the solid waste management system efficiently. However, most cities were cleaned in Puducherry same things should follow everywhere in Puducherry.

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