Analysis on the Solution of Littering in the Streets of Kothanur, Bangalore

Beipalysa Solo

Department of Economics, Kristu Jayanti, India

DOI: https://doi.org/10.51584/IJRIAS.2025.100800145

Received: 11 September 2025; Accepted: 17 September 2025; Published: 23 September 2025

ABSTRACT

The littering behaviour is the behaviour that people forget about to concern and take it as usual in their daily lives. In this paper the idea is proposed as sequential trash bin system which is systematic way of placing trash bins for the solution of littering behaviour or littering in the streets. The data were collected through questionnaires using Google form and analysed using excel. The results of the study shows that most of the littering is due to the unavailability of trash bin nearby when they try to throw waste and the most effective way to prevent them is availability of trash bin.

Keywords: Trash bins, Cleanliness, Fines, Awareness Programmes.

INTRODUCTION

Litter is trash or any other waste material that is discarded or scattered and tends to create nuisance, or danger to life, environment, public life, safety and welfare. Littering behaviour is throwing or depositing litter in any public space or outside the trash cans, private property or parked or moving vehicles.

The behaviour of making a place or area untidy with rubbish, or disposing waste in wrong place. It is the habits that the people possess of throwing or spreading of waste in the streets, public places or in wrong places. Individuals leave a variety of items lying around, such as plastic bags, bottles, and hazardous waste, and won't put them in trash cans.

Problem Statement

The behaviour of littering had already prevailed especially in the Indian society. It is rest upon every individual that form a family, community and society. This behaviour had embedded since our childhood and it is something that cannot be change just by awareness, information, technology et cetera, it gives the idea to the people but not the tool. So, to change this behaviour of littering, it is important to always let them grab/see the tool that they need. Placing trash bins from place to place with a less gap in the road sides will help in the long-run to completely care of the waste littering behaviour individually or in a family, community and society. Cleanliness somehow induced people not to litter but it is just making them alarm not to litter. So, this behaviour of littering is all depends upon placement of trash bins and without it, it is easy to litter again in the streets when we are out of home. Littering is an environmental and economic issue that has an impact on the cleanliness and hygiene of the city's streets. Despite the establishment of waste management systems, littering remains a major issue, particularly in suburban areas such as Kothanur. The problem is exacerbated by a lack of awareness and education about littering issues, as well as insufficient infrastructure and resources for waste management. Littering has a negative impact on public health, safety, and the environment, as well as economic costs for the community, including waste collection, transportation, and disposal. The urgent need is to identify effective solutions to reduce littering and improve littering behaviours.

It is significant to change this littering behaviour because this waste littered in the public places or in any places have negative effects to the people who are living nearby the areas by spreading germs which can lead to the outbreak of diseases like cholera and typhoid and can indirectly causes malaria by increasing the number of

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

mosquitoes. Besides that, it is improper to always litter not in the right place and disturbance for the people to see the waste littered and reduced the interest of the people to visit the particular area. It can also create quarrels among the neighbourhoods despite the environment impact like air pollution, soil pollution, ground water pollution et cetera.

The relevant country closest to the idea is Indonesia where Indonesians commonly putting their trashes in their personal garbage area which usually located at the front of their house, right at the side of the street. Garbage collector will pick up the trashes and the bill are personally to the agent of garbage collection with no tax that is cost of workers fee and transportation fee. Germany adopted separation of bins for different waste, most importantly there are commonly seven public garbage bins available in the Germans apartment and housing area. Source: Countries with the Most Interesting Waste Sorting Culture - Waste4Change.com

Objective of the study

1. To find most effective way to reduce littering.

LITERATURE REVIEW

(Wadehra & Mishra, 2018) studied on Encouraging urban households to segregate the waste they generate and to investigate the determinants of waste segregation behaviour at household level to understand the effect of intervention-information, norms, and incentives, to ensure compliance with SWM Rules 2016 to understand how the interventions differ in their influence across the socio-economic categories of the society. The methods were Survey Interventions, Baseline, Monitoring, Final Survey and parameters used included household size, age of the respondent and Retired/Non-earning members, Education-Up to class 12, graduate, post graduate and above, Gender-female and male, house ownership-Owned and Rented. The results show that 90% were educated and most of the respondents were females. SWM Rules are unaware by 96% of the households. Segregation behaviour can be change by low-cost intervention. Information and economic incentives also induced households to segregate at source. They suggested Lesser fee for those who segregate and higher for those who do not and educating garbage collector.

(LitteringPublication, n.d.) Khattar studied about the relationship between locus of control and opinion towards curbing littering behaviour (2009) to find relationship between locus of control and opinion towards curbing littering behaviour whether internal locus of control have positive towards curbing behaviour of littering. The methods they are using were Rotter's locus of control scale, 8-item questionnaire, Bi-variate correlation and the parameters included 100 post graduate students of male and female with the ratio of1:1. The results show that there was negative correlation between locus of control and opinion towards curbing behaviour of littering. That is individuals with an internal locus of control have positive opinion towards curbing behaviour of littering. They suggested Implementers of awareness programmes and environmental education should give consideration to the perceptions and personal dispositions of their clients before implementing.

(Singh & Kaur, 2021) studied on Influencing the intention to adopt anti-littering behaviour and they focused on influence of attitude, subjective norms and self-efficacy on the intention to adopt anti-littering behaviour. The methods they are using includes Interview, Field survey, AMOS 21.0 and the parameters to find the results includes Attitude, Subjective norms, Self-efficacy. The results show that there was significant influence on the intention to adopt behaviour of anti-littering by attitude, subjective norms and self-efficacy out of which subjective norms influence intention to the highest extend and attitude comes next. They recommended to target subjective norms and attitude for the designing of interventions by social marketers.

(Gupta & South Asian Network for Development and Environmental Economics., 2011), Kanupriya Gupta studied on the Incentives to reduce plastic bag use to test and compare the effectiveness of a portfolio of options to limit plastic bags use and to compare how the own bags use differs across various socio-economic characteristics. The methods employed in the study includes, Experiment, Survey and Intervention. The parameters that the study used to conclude the results were Price and non-price instruments, Provision of information, Cash-back scheme and the Substitution. The results show that the intervention of policy increase the own bag use of consumers from 4.6% to 17% post treatment and decrease on average of plastic bags use

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

from 80.8% to 57.1%. It concluded that a blanket ban with little capacity of enforcement is not the best solution. The study suggested Policy-mix of low-cost information intervention, plastic bags substitution availability and plastic bags subsidies and taxes.

(Mugilarasan et al., 2021) studied about Spatiotemporal variation in anthropogenic litter of marine pollution along the northeast beaches of India to evaluate distribution of spatiotemporal, abundance, typology and source of marine litter. The methods that they are using includes OSPAR monitoring standard and Numeric modelling. The parameters they employed for describing the matter for coming to the conclusion includes Spatiotemporal distribution, Composition and beach quality. The results revealed that anthropogenic litter to the northeast beaches were carried by Hooghly, Rasulpur and Subarnarekha rivers. Distance increased from the shore reduced litter flux and act as a sink to the sea floor. Household l, tourism and fishing were the representatives of marine litter distribution and typology. They suggested better regional litter management measures, including reduction of source, mitigation, beach environment management and environmental education.

(Milea, 2009) studied on the Issues of social and environment justice and the od residents in municipal solid waste management in Delhi, India to identify the attitude and behaviour of city residents related to waste management and the factors influencing them. The methods included triangulation of key information interviews, statistical analysis based on a survey, observations, random and convenience sampling. The parameters of the particular studies were demographic (age, income, education, location, caste, sex, religion etc), knowledge, perception, moral norms and attitudes. The results of this paper found that there was little awareness on how to solve the problem. Responsibility of own's waste was the determining factor of littering and waste separation and minimization is associated with the income and not part of the problem. The study suggested information and motivation campaigns that aims to citizens cooperation and creating a shared of social goals and measures that facilitate participation of citizen.

(Das & Kr Bhattacharyya, n.d.) studied on the Estimation of municipal solid waste generation and future trends in greater metropolitan regions of Kolkata, India (2014) to estimation of municipal solid waste generation and future trends in greater metropolitan regions of Kolkata, India. The methods they are utilising comprised of corelation analysis and forecasting and the parameters included economic growth, lifestyle, food habits (per capita waste generation), rate of population. The results show that there will be proportional increase in waste generation rate if the population growth and the percentage growth increase in per capita and the 32 Lakh metric tonne solid waste generation is expected per year in 2035 and decoupling of waste generation and economic growth. They suggested that firms and households waste generation in relation to economic activities must decrease in the future and larger areas of land must be used for shortage of landfill.

(Campos, 2014) studied on the recycling of Brazil for analysing the formal and informal areas that deal with solid waste performance. The method of the study is comparative analysing the informal and formal. The parameters of analysing the study includes labour conditions, waste recovery facilities and recycling materials. The result found that per capita waste generation increased as income and consumption of poor families rise. The MRFs requirement of health and sanitary are weak in informal areas and paying to rag pickers are not in a legal provision. There is utilisation of federal law by municipalities between association of waste pickers and cooperatives. The study suggested classification of technological models for material recovery facilities, based on their level of automation and nominal capacities, similar to how incineration plants are classified around the world.

(Hage et al., 2009) studied about norms and economic motivation in household recycling and focused on emphasizing the issue of packaging waste. The methods of the study included postal survey, probit regression framework. The results show that recycling rates are influenced by economic and moral motives. Convenience matters because property-close collection increases collection rates in multi-family housing. A significant portion of the variation between households can be attributed to the strength of moral norms, but the significance of these norms in motivating recycling efforts will be somewhat diminished if improved collection infrastructure makes it simpler for households to recycle. The perceived potential to favourably influence environmental consequences as well as other people's recycling activities have a beneficial impact on home recycling rates. They suggested of policy focused on economic and moral motivation.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

(Starr & Nicolson, 2015) studied about patterns in trash and focused on factors driving municipal recycling rates. The method employed for the study was a conceptual framework and the parameters to described the study included policy, programmes, contextual, socio-economic and demographic. The results found the most influencing factor of recycling rates to be pay-as-you-throw (PAYT) and the effect variety depends on recycling services like subscription, curb-side and drop off. The curb-side paired even makes it more recycling. It also found education and median age to be most significant contextual factors and facilities of materials recycling also played a role. The study suggested effectives programmes in order to reduce waste and recycle more.

(Al-Khatib et al., 2009) studied about understanding the effects of gender to enhanced solid waste management to examine people's view on aspects related to Street littering and to compare attitudes of littering and practice of people. The methods included in the study were structured questionnaires, survey statistical package for social science (SPSS) and ANOVA. The parameters that are used in the study were Income, martial-status and religious convictions. The results show that there is strong correlation in the variables or characteristics not only in the practices and littering behaviour but also in the potential litter prevention strategies. They suggested integrated approach like cognitive solution, social solutions like fines and technology.

(Al-Khatib, 2009) studied about children's perceptions and behaviour with respect to glass littering in developing countries to evaluate the children's attitudes and current situation regarding glass litter in the streets. The methods of the study included interview with structured questionnaire and the level of education, age and residence parameters were used to differentiate the results of the study. The results found that 41.7% had litter in the streets and 58.3% were already injured by the broken glass at least once and professional medical care for lacerations received by 95 children. Also increase littering due to lack of disposal cans. The study suggested moral and religious convictions, street cleanliness campaigns by local authorities, education and public awareness and recycling incentives.

(Krauss et al., 1978) studied about Field and laboratory studies of littering to experiment the design and find out demographic and situational littering correlates and the effect of cleanliness area and its probability of littering and also to evaluate the effect of noise on littering and to copy the effect of cleanliness of the environment. The methods that they are using includes experiment and pilot study. The parameters they used for the study were demographic and situational correlates, cleanliness and normative controls. The results show that rates of littering differed across areas of urban region and it was correlated with the previous littered. The males were borne more than females and young people than old. Cleanliness also played a role to reduce littering. It was found that there is no relationship between the stress experienced and littering and people who were asked to sign a petition for clean streets littered less than the control group. They suggested awareness of environmental concerns and street cleaning.

(Carmi, 2019) studied on social distress, littering and nature conservation to better design interventions that address littering behaviour. The methods of the study included setting and sampling procedure. the parameters of the study were perceived level of dirtiness, disturbance by litter items, reasons for self-littering and for others public. The results found that most people did not like the dirtiness of the street and disturbed by it. The main of littering was insufficient of cans, habit and previous litters. More municipality in the beaches than streets. The finding s of the study suggested early education, fines, infrastructure, enforcement effective campaign and government bodied to allocate budgets for cleanliness.

Literature Gap

To change the littering behaviour, it is important to focus on how the subjects can practically apply daily. Most of the suggestion from the literature is about educating, awareness, norms, policies, motivation, programmes et cetera. Some of the literature even suggest on sufficient trash bins but they failed to focus on how it will be implemented. This paper focused on finding the most effective way of prevention of littering and suggesting to solve the problem of littering in the public with a slow changing littering behaviour with a focus more on a practical application of the people in their daily life.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

Idea Detail to achieve the objective

The behaviour of littering is practice by individuals or as in a family, community, society. This littering behaviour of individuals is the sole importance that needs to be triggered and change or erase from the individual's behaviour. Since, individuals are the family, community and society can perform the changing behaviour that is attempted through sequential trash bin system. It is system of placing sufficient dust bins in the road sides or in the streets from place to place, in a consecutive manner with a proper structure to prevent disruption of the trash bins from the street dogs as well as human beings. This will help the people notice the dust bins nearby and induce them to throw the waste in the right place. To follow the policy, first of all people must be the policy in themselves and only the policy will fulfil and this system will help the people to achieve a policy in themselves that is changing littering behaviour.

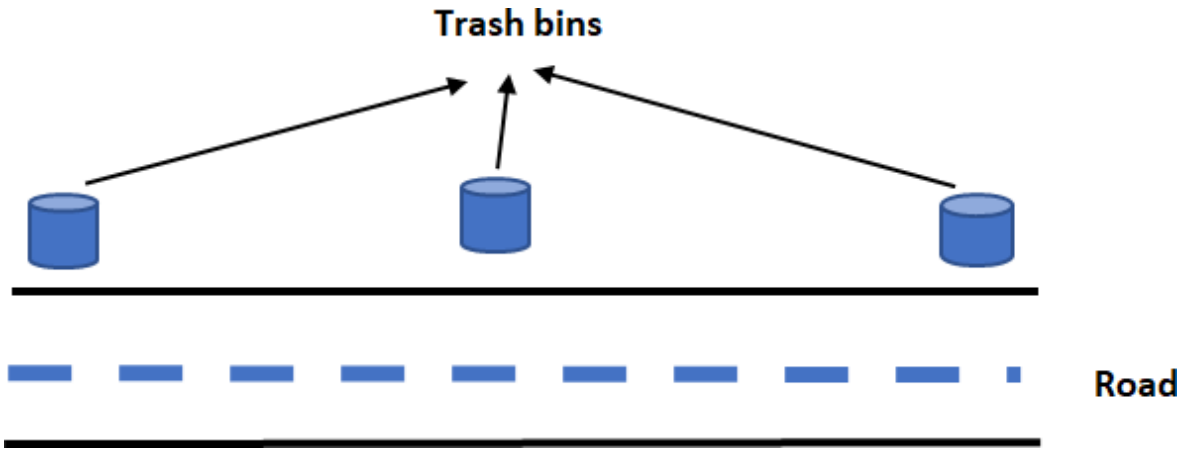

Figure 1. Sequential Trash bin

Figure 1 is the pictorial presentation of the idea where we have trash bins in a sequential system in the road side of the particular area attempted behavioural change of littering. For example, when we are in the house, we never litter around the house since we have our own trash bin in every household but when we go out of our home, most of us litter again in the streets because if a person even wants to litter in the trash bin but no trash bin nearby, it is easy for him/her to litter again in the streets and this is the problem of every person. To deal with this, sequential trash bin system like a placement of electric post or street light post in the roads is needed to let the people see the trash bin easily in the streets.

The implementation of the idea falls upon the government and Solid Waste Management Department is responsible for managing process, this management process is important as the implementation. It is difficult for the private to perform and manage the process in the long-run. Besides that, if the private implement the idea, there will be high cost/charges to the public/people. This may negatively impact to the cost-benefit analysis of the public or government. The government implementation will help the rag pickers, waste pickers jobs more easy and less injurious to health that was included in Solid Waste Management Rules of 2016. Focusing all over the country at once will be difficult but it is important not to neglect any area may be of rural, semi-urban and urban, whether commercial streets or any place since this littering is happening everywhere. Neglecting in the beginning/basic stage leads to greater problems in the long-run. Likewise, caring in the small stage is solving of the big problems that may arise in the coming days. To test the idea, it is important to focus more on crowded areas but underdeveloped areas because littering is more intense than the core area in the sense that where population of the area is high but the infrastructure or the public goods were not accessible and cleanliness of the area is low or where crowded places of periphery of the city and the system can be tested in the any city of this particular area. If the government conducted cleaner work in the particular area before the implementation of this system, it will help in boosting the focus changing behaviour of littering.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

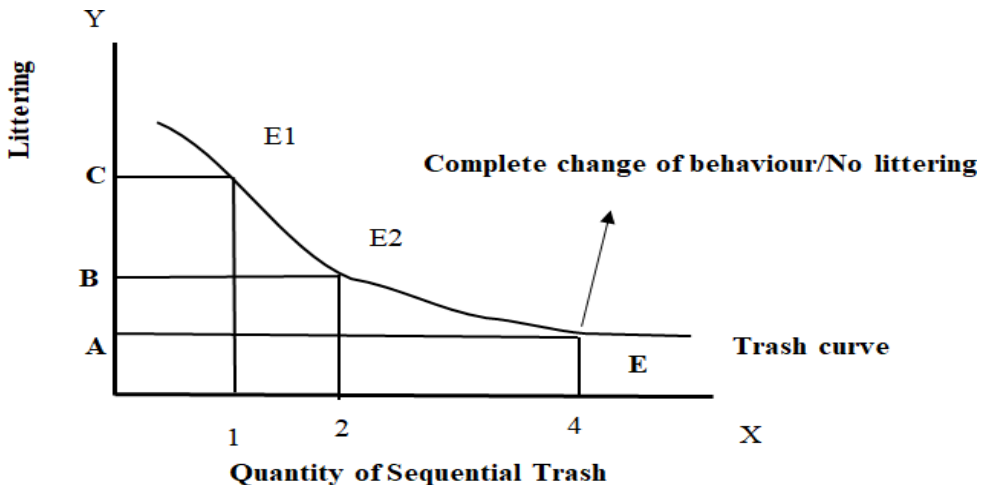

Figure 2. Diagrammatic presentation of Sequential Trash bin System

Figure 2 is the presentation of the idea on how the behaviour of littering will be reduce with the increase of sequential Trash bin. In the figure, Y- axis represent littering whereas X-axis represent the quantity of sequential Trash bin and we have curve representing trash called as trash curve. In the beginning stage where there is high littering and less sequential trash bins that is at C littering and 1 quantity of sequential trash bin, the quantity of trash in the streets is also high which is equilibrium at E1. When the quantity of sequential trash bin increases to 2, the littering also decrease to B from C, simultaneously trash in the streets also decreased which is equilibrium at E2. The important point to note is that, the decrease in littering and increase in sequential trash bin does not necessarily proportionate. In the long-run or at some point in the future where the sequential trash bin is sufficient enough to the people that is the quantity of 4 in figure 2 and littering also falls to A from B with a fall in street trash litters and equilibrium at E. In this point, the trash curve becomes constant and the goal of changing behaviour achieved with no littering.

METHODOLOGY

Data were collected primarily through closed and open questionnaires and qualitative in nature using Google forms from 52 people especially students which consists of 35 (65.4%) undergraduate and 17 (32.7%) Postgraduate in Kothanur, Bangalore. The respondents comprised of 29 (55.8%) male and 23 (44.2%) female with the age group of 18 to 25 years. The data were analysed using excel.

RESULTS AND DISCUSSION

To understand on how the behaviour of littering can be reduce or change, five major influencing factors were used that is Awareness Programmes, Fines, Availability of trash bins and Cleanliness of the streets and Visual prompts. These were the independent variables because it does not mean that maintaining of these factors must take place only in high littering. If these factors were maintained only in the high occurrence of littering, then the possibility of litters in the streets will be higher due to which littering behaviour is the dependent variable that will depend on how the performance of these independent variables.

The questions that are asked during the collection of data and the percentage differences of answers.

Table 1

Row Labels	**Count of Do you throw litter in the streets?**
Mostly	**2 (3.85%)**
Never	**25 (48.08%)**

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

Sometimes	**16 (30.77%)**
When no nearby trash bins	**9 (17.31%)**
Grand Total	**52**
Row Labels	**Count of What is the driving cause for you to litter?**
Deficiency of awareness	**4 (7.69%)**
Depends on my situation	**13 (25.00%)**
Dirty place	**3 (5.77%)**
I don't litter	**1 (1.92%)**
I don't usually litter at all	**1 (1.92%)**
I don't litter	**1 (1.92%)**
I would never throw litter without a trash bin. I threw wet waste few times.	**1 (1.92%)**
It is a bad manner.	**1 (1.92%)**
Laziness	**1 (1.92%)**
No trash bin	**26 (50.00%)**
Grand Total	**52**
Row Labels	**Count of which of the following will be the most effective in preventing you from littering?**
Availability of trash bins	**29 (55.77%)**
Awareness programmes	**2 (3.85%)**
cleanliness of the streets	**14 (26.92%)**
Fines	**7 (13.46%)**
Grand Total	**52**

In table 1, the first answered of research question shows that people who litter mostly comes at the lowest percent of 3.85% out of 52 sample and the highest comes at never litter with a percentage of 48.08% out of 52 sample. The answered of the second question shows that the people who littered is due to the unavailability of trash bin which comes at the highest percentage of 50.00% and littered depends on their situation comes at percentage of 25.00% and deficiency of awareness comes at percentage of 7.69%. Last but most important answered of the question shows that available of trash bin will prevent them from littering comes at the highest percentage of 55.77% and awareness programmes comes at the lowest percentage of 3.85%.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

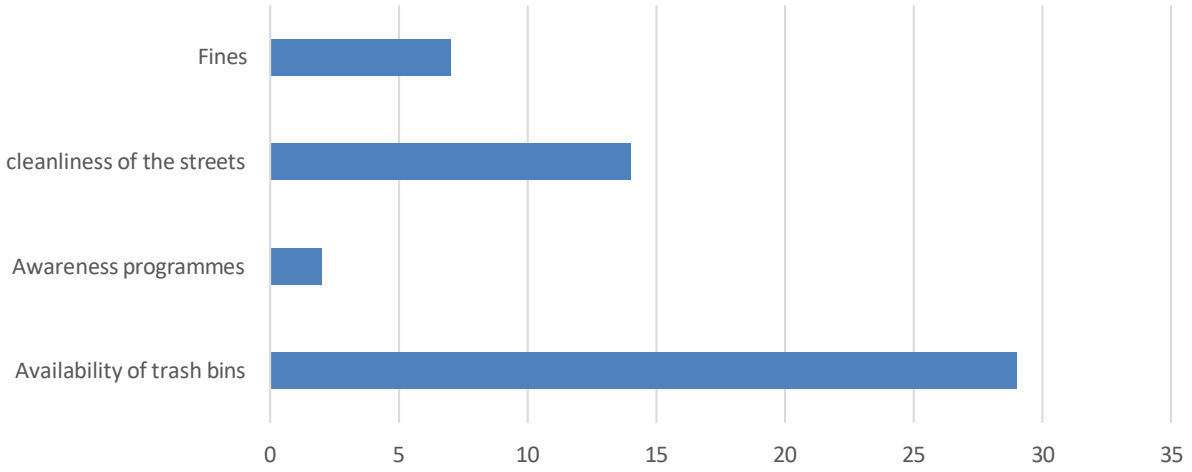

Figure 3. Prevention of littering

From figure 3 as the research answers showed, prevention of the littering will be most effective with the availability of trash bin. In this case, the idea of sequential trash bin system will play an important role to pace the way of reducing littering in the streets as it will fill the gap of trash bins available for the people which make no place to litter due to the systematic way of following trash bins and this will be the solution for changing the behaviour of littering.

CONCLUSION

The unseen problem that will be the big problem for the human beings and the environment ecosystem is the littering that majority of the people takes it as usual in our daily lives. If you go out in some place other than core areas of the city, you will see a lots of littering in the streets and the real face or beauty of the city as well the country comes from the areas where littering is high. The idea to reduce this littering is following the sequential trash bin system that is systematic placing of trash bins sequencing in the streets. The results of the study shows that most of the littering is due to the unavailability of trash bin nearby when they try to throw waste and the most effective way to prevent them is availability of trash bin. The solution for this problem is the implementation of sequential trash bin system.

REFERENCES

1. Al-Khatib, I. A. (2009). Children's perceptions and behavior with respect to glass littering in developing countries: A case study in Palestine's Nablus district. Waste Management, 29(4), 1434–1437. https://doi.org/10.1016/j.wasman.2008.08.026
2. Campos, H. K. T. (2014). Recycling in Brazil: Challenges and prospects. Resources, Conservation and Recycling, 85, 130–138. https://doi.org/10.1016/j.resconrec.2013.10.017
3. Carmi, N. (2019). On Social Distress, Littering and Nature Conservation: The Case of Jisr A-Zarka. Coastal Management, 47(4), 347–361. https://doi.org/10.1080/08920753.2019.1598223
4. Das, S., & Kr Bhattacharyya, B. (n.d.). Estimation of Municipal Solid Waste Generation and Future Trends in Greater Metropolitan Regions of Kolkata, India.
5. Farage, L., Uhl-Haedicke, I., & Hansen, N. (2021). Problem awareness does not predict littering: A field study on littering in the Gambia. Journal of Environmental Psychology, 77. https://doi.org/10.1016/j.jenvp.2021.101686
6. Gupta, Kanupriya., & South Asian Network for Development and Environmental Economics. (2011). Consumer responses to incentives to reduce plastic bag use: evidence from a field experiment in urban India. South Asian Network for Development and Environmental Economics.
7. Hage, O., Söderholm, P., & Berglund, C. (2009). Norms and economic motivation in household recycling: Empirical evidence from Sweden. Resources, Conservation and Recycling, 53(3), 155–165. https://doi.org/10.1016/j.resconrec.2008.11.003

8. Krauss, R. M., Freedman, J. L., & Whitcijp', M. (1978). Field and Laboratory Studies of Littering. In JOURNAL OF EXPERIMENTAL SOCIAL PSYCHOLOGY (Vol. 14).
9. Milea, A. (2009). WASTE AS A SOCIAL DILEMMA ISSUES OF SOCIAL AND ENVIRONMENTAL JUSTICE AND THE ROLE OF RESIDENTS IN MUNICIPAL SOLID WASTE MANAGEMENT, DELHI, INDIA.
10. Mugilarasan, M., Karthik, R., Purvaja, R., Robin, R. S., Subbareddy, B., Hariharan, G., Rohan, S., Jinoj, T. P. S., Anandavelu, I., Pugalenthi, P., & Ramesh, R. (2021). Spatiotemporal variations in anthropogenic marine litter pollution along the northeast beaches of India. Environmental Pollution, 280. https://doi.org/10.1016/j.envpol.2021.116954
11. Singh, J., & Kaur, R. (2021). Influencing the Intention to Adopt Anti-Littering Behavior: An Approach with Modified TPB Model. Social Marketing Quarterly, 27(2), 117–132. https://doi.org/10.1177/15245004211013333
12. Starr, J., & Nicolson, C. (2015). Patterns in trash: Factors driving municipal recycling in Massachusetts. Resources, Conservation and Recycling, 99, 7–18. https://doi.org/10.1016/j.resconrec.2015.03.009
13. Wadehra, S., & Mishra, A. (2018). Encouraging urban households to segregate the waste they generate: Insights from a field experiment in Delhi, India. Resources, Conservation and Recycling, 134, 239–247. https://doi.org/10.1016/j.resconrec.2018.03.013