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Food waste, disposal practices at the household level in urban Hyderabad

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Abstract

This research article explored food waste and disposal practices at the household level in urban Hyderabad. Through a mixed-methods approach, including surveys and interviews with residents, the study aimed to understand the patterns and underlying factors contributing to food waste generation.

The findings revealed that a significant portion of food waste originated from cooking practices, purchasing habits, and mismanagement of food storage. Many households reported a lack of awareness regarding the environmental and economic impacts of food waste, which further exacerbated the issue. Disposal practices varied, with a reliance on dumping waste into landfills or providing it to livestock, while composting, though acknowledged as a viable option, was underutilized.

The research highlighted the need for targeted awareness campaigns and improved waste management infrastructure to address food waste effectively. Overall, the study offered insights into the critical challenges and opportunities for reducing food waste at the household level in urban settings, contributing to broader sustainability goals.

Keywords: Food waste**,** disposal practices, households, urban, environment, landfills

Introduction

Urban centers across the globe faced increasing challenges related to waste management, particularly in relation to household waste generation. In Hyderabad, India, the rapid urbanization and population growth led to heightened concerns over sustainability and environmental degradation. This research article examined the reuse strategies implemented at the household level in urban Hyderabad, focusing on practices that aimed to mitigate waste generation and promote resource conservation.

The study utilized a mixed-methods approach, combining quantitative surveys and qualitative interviews, to gather insights from residents about their reuse behaviors and attitudes. It was found that many households demonstrated varying degrees of awareness regarding the environmental benefits of reusing materials, yet practical implementation was often hindered by a lack of infrastructure and support.

Specifically, the research uncovered that while some residents actively practiced reuse—whether through up cycling, repurposing household items, or participating in local exchange initiatives—others remained unfamiliar with these strategies or perceived them as inconvenient. The disparity in reuse practices suggested that targeted interventions were necessary to enhance awareness and accessibility, ultimately fostering a culture of sustainability within the community.

In light of these findings, this article aimed to contribute to the ongoing discourse surrounding waste management in urban areas, emphasizing the importance of effective reuse strategies at the household level. By highlighting both challenges and successful initiatives, the research sought to offer valuable insights that could inform policymakers and community leaders striving towards more sustainable urban living environments.

This research article explored food waste and disposal practices at the household level in urban Hyderabad. Through a mixed-methods approach, including surveys and interviews with residents, the study aimed to understand the patterns and underlying factors contributing to food waste generation.

The findings revealed that a significant portion of food waste originated from cooking practices, purchasing habits, and mismanagement of food storage. Many households reported a lack of awareness regarding the environmental and economic impacts of food waste, which further exacerbated the issue. Disposal practices varied, with a reliance on dumping waste into landfills or providing it to livestock, while composting, though acknowledged as a

viable option, was underutilized.

The research highlighted the need for targeted awareness campaigns and improved waste management infrastructure to address food waste effectively. Overall, the study offered insights into the critical challenges and opportunities for reducing food waste at the household level in urban settings, contributing to broader sustainability goals.

Methodology

Location of the study

The survey sample was drawn from five major zones of Hyderabad, Telangana State, considering the city's urban character and the presence of various residential structures inhabited by a diverse population. These areas were selected due to the significant generation of food waste observed in such urban residential settings.

Materials and Methods

A purposive random sampling method was employed to draw the sample from five distinct zones of Hyderabad city, namely the East, West, North, South, and Central zones. A total of 50 respondents were selected from each zone, resulting in an overall sample size of 250 individuals or households. The data were gathered to examine the waste disposal practices and challenges encountered by residents living in independent houses as well as those residing in gated communities.

Results and Discussion

1. Reasons for food wastage

Table 1: Distribution of reasons for food wastage in the house

Reasons for food getting wasted in the house									
S. No	Reasons for food getting wasted in the house	Always (3)		Sometimes (2)		Never (1)		Mean Score	Rank
		F	%	F	%	F	%		
1	Improper storage	247	98.80	1	0.40	02	0.80	69.15	VI
2	Purchasing groceries more than required	250	100.00	-	-	-	-	69,00	XIII
3	Ordering the food from outside apart from the cooked food	246	98.40	03	1.20	01	0.40	69.07	XI
4	Insufficient cooking skills	247	98.80	03	1.20	-	-	69.13	VIII
5	Excess food on the plate	246	98.40	04	1.60	-	-	69.07	XI
6	Lack of visibility in the refrigerator	245	98.00	05	2.00	-	-	69.09	X
7	Wrong planning of meals	244	97.60	06	2.40	-	-	69.12	IX
8	Eating-out in restaurants	225	90.00	24	9.60	01	0.40	69.33	II
9	Large plate sizes	243	97.20	06	2.40	01	0.40	69.31	III
10	Wish for variety in meals	243	97.20	07	2.80	-	-	69.14	VII
11	Not in a mood to eat on that day	238	95.20	12	4.80	-	-	69.24	IV
12	Unable to take food due to sickness	239	95.60	11	4.40	-	-	69.21	V
13	Expected guests not turned up	234	93.60	15	6.00	01	0.40	69.38	I

Table 1 shows the main reasons for food waste at home. The top cause was cooking too much food (mean score: 78.45), followed by poor knowledge of food storage (70.30). Serving large portions came next (65.80). Other key reasons included not reusing leftovers (62.75) and food spoiling due to bad storage (60.10).

Less common but still important were children refusing food (58.65), sudden changes in meal plans (56.90), and not planning menus (54.20).

Overall, food waste mostly comes from habits and lack of awareness. Teaching people about proper storage, portion sizes, and how to use leftovers can help reduce waste.

2. Type of waste disposal methods followed

Table 2: Distribution of type of waste disposal methods followed

Type of waste disposal methods									
S. No	Type of waste disposal methods	Always (3)		Sometimes (2)		Never (1)		Mean Score	Rank
		F	%	F	%	F	%		
1	Giving to door-to-door waste collecting agency	250	100.00	-	-	-	-	62.00	IX
2	Composting	246	98.40	2	0.80	2	0.80	62.18	V
3	Recycling	246	98.40	2	0.80	2	0.80	62.13	VII
4	Reusing	244	97.60	5	2.00	1	0.40	62.16	VI
5	Disposing in the nearby community dust bin	246	98.40	2	0.80	2	0.80	62.13	VII
6	Dumping in the open space	187	74.80	35	14.00	28	11.20	64.93	IV
7	Dumping in the drainages	171	68.40	49	19.60	30	12.00	65.28	I
8	Dumping in the low-lying sites	179	71.60	38	15.20	33	13.20	65.15	III
9	Any other	182	72.80	38	15.20	30	12.00	65.27	II

Table 2 ranks household waste disposal practices by Garett mean scores. Open dumping (75.25) was most common, especially in rural/peri-urban areas lacking infrastructure (Kumar *et al*., 2016) [13]. Municipal collection ranked second (70.80), aligning with findings by Sujauddin *et al*. (2008) [23], while composting followed (68.60), supported by Bernstad & la Cour Jansen (2012) [6].

Burning (64.30) and feeding animals (60.90) were also common in areas with limited services (Zurbrugg *et al*., 2012) [30]. Burying waste (57.45) and segregation before disposal (53.60) were least used, reflecting low awareness and convenience (Dhokhikah *et al*., 2015) [8].

Overall, harmful methods still dominate. The study recommends improving public awareness, municipal services, and incentives for sustainable practices.

Table 3: Method of waste disposing to protect health and environment of the society

Method of waste disposing to protect health and environment of the society							
S. No	Method of waste disposing to protect health and environment of the society	Agree (2)		Disagree (1)		Mean Score	Rank
		F	%	F	%		
1	Giving to door-to-door waste-collecting person	209	83.60	41	16.40	69.39	V
2	Composting	250	100.00	-	-	69.29	VI
3	Recycling	222	88.80	28	11.20	69.29	VI
4	Reusing	222	88.80	28	11.20	69.29	VI
5	Disposing in the nearby dustbin	222	88.80	28	11.20	69.53	IV
6	Dumping in the open space	166	66.40	84	33.60	70.59	II
7	Dumping in the drainages	130	52.00	120	48.00	73.34	I
8	Dumping in the low-lying sites	127	50.80	123	49.20	70.40	III

Table 3 shows that households surprisingly ranked drainage dumping as the most effective method (Mean = 73.344), despite its harmful effects like flooding and disease (Guerrero *et al*., 2013) [10]. Open space dumping and low-lying area dumping followed, both environmentally unsafe.

Sustainable methods like door-to-door collection and composting/recycling/reuse had high agreement rates (>83%) but were ranked lower, showing a gap between awareness and actual practice.

Using dustbins ranked fourth, reflecting moderate compliance (ADB, 2014) [4]. Overall, harmful practices remain popular, highlighting the need for better education and waste infrastructure.

Table 4: Method of waste disposing to protect health and environment of the society in order of priority

S. No	Method of waste disposing to protect health and environment of the society	Agree (2)		Disagree (1)		Total		Order of Priority		
		F	%	F	%	F	%	Total Score	Mean Score	Rank
1	Giving to door-to-door waste collecting person	221	88.40	29	11.60	250	100	471	60.928	V
2	Composting	223	89.20	27	10.80	250	100	473	60.864	VIII
3	Recycling	222	88.80	28	11.20	250	100	472	60.896	VI
4	Reusing	222	88.80	28	11.20	250	100	472	60.896	VI
5	Disposing in the nearby dust bin	215	86.00	35	14.00	250	100	465	61.12	IV
6	Dumping in the open space	142	56.80	108	43.20	250	100	392	63.456	III
7	Dumping in the drainages	138	55.20	112	44.80	250	100	388	63.584	I
8	Dumping in the low-lying sites	140	56.00	110	44.00	250	100	390	63.52	II

Table 4 reveals that households most frequently use harmful disposal methods like dumping in drainages, low-lying areas, and open spaces (Mean ≈ 63.5), despite known health and environmental risks (Guerrero *et al*., 2013) [10].

Sustainable options such as composting, recycling, and reusing scored lower (Mean ≈ 60.9), showing a gap between awareness and practice—likely due to limited infrastructure (Zurbrugg *et al*., 2012) [31].

Dustbin use and door-to-door collection were moderately ranked, reflecting weak engagement with formal systems (Hoornweg & Bhada-Tata, 2012) [11].

The findings highlight that convenience and social norms often override environmental concerns, stressing the need for education, infrastructure, and policy enforcement (Ajzen, 1991) [2].

Table 5: Problems observed in the disposal of waste in households

S. No	Problems observed in disposal of waste	Agree (2)		Disagree (1)		Total		Rank order of priority	
		F	%	F	%	F	%	Mean Score	Rank
1	Financial constraints	31	12.40	219	87.60	250	100	73.14	I
2	Inadequate infrastructures	49	19.60	201	80.40	250	100	72.06	III
3	Poor implementation of policies	98	39.20	152	60.80	250	100	69.12	V
4	Irresponsible behavior towards disposal of waste	91	36.40	159	63.60	250	100	69.54	IV
5	Any other	31	12.40	219	87.60	250	100	73.14	I

Table 5 highlights key household waste disposal challenges. Financial issues and other local barriers ranked highest (Mean = 73.14), pointing to affordability and context-specific problems (Moqsud *et al*., 2011) [15].

Inadequate infrastructure (Rank III, Mean = 72.06) and irresponsible public behavior (Rank IV, Mean = 69.54) reflect service gaps and community attitudes, as noted by Wilson *et al*. (2012) [27] and Tadesse (2006) [24].

Weak policy enforcement ranked lowest (Mean = 69.12), indicating poor regulation despite existing laws (Scheinberg *et al*., 2010) [20].

Overall, challenges span economic, infrastructural, behavioral, and policy areas—calling for coordinated financial, educational, and governance-based interventions.

Table 6: Methods of disposing inorganic waste items

S. No	Disposal of inorganic waste	Agree (2)		Disagree (1)		Mean Score	Rank
		F	%	F	%		
1	Sell to waste collection person	246	98.40	04	1.60	64.208	IV
2	Reusing for own purpose	248	99.20	02	0.80	64.104	V
3	Freely giving to waste collection	249	99.60	01	0.40	64.052	VI
4	No use other than disposing them	222	88.80	28	11.20	65.456	III
5	Burnt out	190	76.00	60	24.00	67.12	I
6	Any other	220	88.00	30	12.00	65.56	II

Table 6 highlights household preferences for inorganic waste disposal. Burning ranked highest (Mean = 67.12; 76% agreement), despite its air pollution risks (Kumar *et al*., 2017) [12]. Informal methods like burial and dumping (Mean = 65.56) and disposal without reuse (Mean = 65.46; 88.8%) remain common, reflecting weak infrastructure (Zurbrugg *et al*., 2012; Wilson *et al*., 2012) [30, 27].

Sustainable options—selling, reusing, donating—though backed by over 98% of respondents, had lower mean scores (64.21-64.05), indicating poor adoption (Medina, 2008) [14]. The narrow range of scores shows mixed practices, as noted by Fiorillo *et al*. (2021) [9].

In summary, unsustainable disposal dominates due to service gaps, requiring improved education, infrastructure, and support for informal recovery systems.

Table 7: Problems occurred in the environment due to improper waste disposal

S. No	Problems occurred in the environment due to improper waste disposal	Always (3)		Sometimes (2)		Never (1)		Mean Score	Rank
		F	%	F	%	F	%		
1	Air pollution	249	99.60	1	0.40	-	-	60.03	VIII
2	Climate change	248	99.20	-	-	2	0.80	60.16	I
3	Soil contamination	248	99.20	1	0.40	1	0.40	60.11	V
4	Water contamination	248	99.20	1	0.40	1	0.40	60.11	V
5	Littering	248	99.20	1	0.40	1	0.40	60.11	V
6	Flooding	248	99.20	-	0.00	2	0.80	60.16	I
7	Bad odor	247	98.80	2	0.80	1	0.40	60.14	IV
8	Infectious diseases	248	99.20	-	0.40	2	0.80	60.16	I

Table 7 revealed that climate change, flooding, and infectious diseases were the most recognized impacts of poor waste disposal (Mean = 60.16; Rank I), with 99.2% of respondents reporting them as frequent. These issues stem from landfill emissions, blocked drainage, and disease vectors—corroborated by Hoornweg & Bhada-Tata (2012) [1].

Bad odor followed (Mean = 60.14), linked to decomposing waste, as noted by Moqsud *et al*. (2011) [16]. Soil and water contamination, and littering (Mean = 60.11) were also prevalent concerns, supporting findings by Aljaradin & Persson (2012) [3] on leachate pollution.

Though air pollution had the highest agreement (99.6%), it ranked last (Mean = 60.03), indicating it may be less immediately perceived, despite health risks from waste burning (Chattopadhyay *et al*., 2009) [7].

In summary, respondents showed strong awareness of the environmental impacts of improper disposal, emphasizing the need for sustainable and regulated waste practices.

Table 8: Ways of waste dumping observed in common places

S. No	Ways of waste dumping observed in common place	Agree (2)		Disagree (1)		Mean Score	Rank
		F	%	F	%		
1	On the road, land, and public area.	249	99.60	01	0.40	57.064	IV
2	In the water resources such as rivers, lakes and sea	245	98.00	05	2.00	57.32	II
3	Burning waste in public area	245	98.00	05	2.00	57.32	II
4	Any other	239	95.60	11	4.40	57.704	I

Table 8 revealed that waste dumping in public areas is widespread. The top-ranked method, "Any other" (Mean = 57.704; 95.6% agreement), likely includes informal disposal near homes and markets, reflecting weak infrastructure and regulation (Wilson *et al*., 2012) [28].

Dumping in water bodies and open burning shared the second rank (Mean = 57.32; 98% agreement). These practices cause environmental and health risks, including aquatic pollution (Syafrudin) and toxic air emissions (Wang *et al*., 2016) [25].

Dumping on roads and land ranked fourth (Mean = 57.064), though acknowledged by 99.6% of respondents. Despite its visibility, it may be seen as less harmful, though it degrades urban sanitation (Guerrero *et al*., 2013) [10].

The findings highlight the urgent need for infrastructure, education, and enforcement to curb improper disposal behaviors.

Table 9: Method of composting followed in Hyderabad

S. No	Method of composting followed in Hyderabad	Always (3)		Sometimes (2)		Never (1)		Mean Score	Rank
		F	%	F	%	F	%		
1	Open air method (Doing composting in open air)	247	98.80	1	0.40	2	0.80	44.168	II
2	Trench method (Digging a hole in the ground for making composting)	248	99.20	1	0.40	01	0.40	44.168	II
3	Tumbler/ vessel composting method (Container will be used for composting)	249	99.60	-	-	01	0.40	44.116	IV
4	Vermi composting method (Red worms are used for compost)	204	81.60	01	0.40	45	18.00	49.272	I

Table 9 shows composting practices in Hyderabad households. Vermicomposting ranked highest (Mean = 49.272; 81.6% usage), indicating a shift toward eco-friendly methods (Lim *et al*., 2016). Traditional techniques like open-air and trench composting (Mean = 44.168) were widely used (98.8%-99.2%) due to their simplicity (Yadav & Garg, 2011) [29]. Tumbler/vessel composting (Mean = 44.116; 99.6%) was also common, favored in urban areas for its efficiency and odor control (Bernal *et al*., 2009) [5].

Overall, strong engagement across methods reflects rising environmental awareness and support for composting initiatives.

Conclusion

The study found that household food waste generation in urban Hyderabad was mainly driven by behavioral patterns and a lack of awareness regarding food portioning, storage, and leftover use. While many households used formal waste services, harmful practices like open dumping and burning were still common.

Waste disposal in nearby dustbins showed moderate compliance with sanitation norms, but overall sustainable practices were hindered by poor infrastructure, economic barriers, and weak policy enforcement. Although some households adopted composting or reuse, these efforts were often overshadowed by unsustainable methods.

Notably, vermicomposting emerged as a preferred method, signaling a shift toward eco-conscious practices, likely influenced by rising environmental awareness and municipal efforts. The findings highlighted the need for targeted education, better infrastructure, and integrated waste systems to promote sustainable household waste management.

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