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Local Community Cooperation and Participation in Solid Waste Management Activities in Hyderabad City: A Quantitative Survey

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Abstract

Similar to other developing countries, Pakistan is also facing with roughly 50.79 million tons' annual generation of solid waste with annual increase of 2.4 percent, which further makes situation more alarming. Hyderabad is the second most populated city in province of Sindh and a significant portion of Hyderabad's daily solid waste generation is about 4000 tones and only half of it is collected, however, due to lack of civic sense and awareness among local community, proper management of municipal waste or solid waste has become a big challenge for local government and other stakeholders. This paper aims to explore the perception/experience of frontline sanitary workers involved in managing solid waste in Hyderabad city about the community cooperation and participation in various activities related to waste management and green environment. Data were collected through face-to-face surveys using a five-point Likert scale under a simple random sampling design. The paper concluded that there is no any kind of cooperation and participation of community in managing solid waste in Hyderabad, and there is a dire need to initiate awareness campaigns for educating and sensitization of local community regarding the management, reduction of waste in Pakistan.

Keywords: Waste Management, Community Participation, Rapid Urbanization, Sanitary Workers, Pakistan.

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1. Introduction

Unplanned rapid urbanization and high rate of population growth in developing countries like India, Bangladesh, and Pakistan have contributed to municipal waste generation and hindered in waste management because solid waste management is a complex activity that involves the collection, transportation, recycling, and disposal of solid waste. Majority of developing countries have no proper mechanism of waste collection and transportation, this is why the great volume of municipal waste has been witnessed uncontrolled dumped and burnt in streets and residential area, which further poses high risk to human and environment. The multifold reasons of that uncontrolled and managed waste in cities could be lack of skilled human resources, financial capacity, lack of civic sense and awareness among communities, and having no health and hygiene related physical activities in schools (Munsamy, 2022).

Pakistan, being the second largest population in South Asia, generates 30 million metric tons of municipal solid waste(MSW) yearly, and about 50 percent of this generated waste is collected (ADB, 2022). As per the International Trade Administration (2026) Pakistan generates approximately 50.79 million tons of solid waste a year, which has been increasing more than 2.4 percent annually. More than 90,000 tons of solid waste are produced every week, mostly from large cities (ITA, 2026). The estimated waste generated in Karachi city is between 12000 to 15000 tons/day (Majid, Jamal, & Asghar, 2022). Solid waste management in Pakistan has been the neglected and poorly managed sector, which gives rise to contagious diseases. No doubt, government of Sindh has taken initiatives to keep urban environment clean by establishing Sindh Solid Waste Management Boards (SSWMB) at division level (Majid, Jamal & Asghar, 2022). The Government of Sindh has passed Sindh Solid Waste Management Act 2021 and under which Sindh Solid Waste Management Boards (SSWMB) have been established at division level, with a focus on promoting environmental awareness and creating sustainable solutions (SSWMA, 2021). The SSWMB aims to increase public awareness and promote integrated and strategically sound practices of waste disposal that help in creating responsible and sensible communities and build strong coordination between community and responsible waste management departments. Improving solid waste management requires a strong sense of civic responsibility from the public. Solid waste management in Hyderabad, Sindh is primarily managed by the Sindh Solid Waste Management Board (SSWMB) working with a Turkish firm Pak Atlas Waste Management Company to collect and dispose of garbage in the city.

A significant portion of Hyderabad's daily solid waste, estimated at 2000 tons, is collected, with 20% being managed by the SSWMB (Khoso, Memon, Pathan, & Akhund, 2018), but it is still struggling to improve waste management practices and foster a stronger sense of civic responsibility. Due to lack of community involvement, public awareness campaigns, civic sense and education programmes about the importance of proper waste disposal, SSWMB Hyderabad could not get satisfactory results so far. Community involvement in waste management initiatives, such as waste segregation programmes and clean-up drives, can foster a sense of ownership and responsibility. Solid waste management benefits significantly from both community participation and private sector partnerships. Community involvement increases awareness and promotes responsible waste disposal, while private sector participation can bring efficiency and innovation in waste collection, processing, and disposal. Public-private partnerships (PPPs) can help bridge financial gaps, reduce waste, and improve overall waste management performance. This study on solid waste management offers significant benefits for a country as well as province, including improved environmental protection, public health, and economic opportunities.

This quantitative survey based research study aims to assess the participation and cooperation of local community in waste management activities in Hyderabad city. Research helps in identifying the most effective means to educate community, create sense of civic responsibility and active participation of community, leading to a cleaner environment and reduced health risks associated with improper waste disposal.

2. Literature Review

Municipal solid waste, being one of the critical issue of urban areas requires a strong social contract between the municipality or waste management companies and community, because community participation creates sense of ownership among community, which is key of success of any public-driven long-term project like municipal solid waste management. Waste management does not only mean to collect and transport it to recycle processing or landfill point however, waste management is continuous integrated process that contributes to human health, ecology and friendly environment for all livings (Liman, Nabegu, & Yusuf, 2025). Research conducted in Nigeria (Sambo & Wetnwan, Wash, & Bott, 2021) shows that 63 percent of the survey participants agree that solid waste management (SWM) is primarily a priority or responsibility of community as it is benefits them whereas 53 percent have no knowledge of community participation in solid waste activities in their locale. Another research from Nigeria (Liman, Nabegu, & Yusuf, 2025) also shows that 62 percent of research participants did not participate as they perceived that solid waste management is a sole responsibility of municipal corporation or local government, however community participation may play a positive contribution to effective and proper waste management.

Iraguha, Handono and Setyono (2022) conducted research in Kigali, Rwanda revealed that 98 percent of the respondents have very limited information, understanding and knowledge of solid waste management and they have never ever separate solid waste material at their homes. Umuganda (together for common purpose), national monthly community service day in Rwanda, has become mandatory and on last Saturday (8:00am to 11:00am) of every month local communities around the country come out of their homes and participate in cleaning activities and during that most of business activities and traffic suspended. Umuganda has left positive impact on local communities regarding the cleanliness of streets, improved air quality and environmental conversation (Rwanda Governance Board (2017). Thus, the Umuganda is the one of the best model to be replicated in developing countries to create awareness among communities and make them responsible to contribute in developing clean and healthy environment for their coming generations.

In the context of developing countries, the both lack of awareness and attitude of the public regarding the solid waste management have been witnessed major hurdles in effective waste management (Balasooriya, Vithanage, Nawarathna, Zhang, and Herath, 2014; McAllister, 2015). Bolaane (2006) conducting research in Botswana found that having awareness regarding the sustainable waste management techniques among citizens, did not mean it is translated into participation in pro-environment activities reducing, separating and recycling initiatives. The research suggests that community participation plays a significant role in minimization/reduction of waste as well as overall integrated management of solid waste. The concept of community participation is as old one as the concept of community development and not for profit organizations is. Today, the community participation is considered and accepted as one of basic operational determinants of public development projects. Community participation is regarded as a cornerstone of today's democracy (Nyalunga 2006) and is intrinsic to the core meaning of

democracy as it plays an instrumental role in promoting culture of good governance and quality service delivery at local level. According to Mubangizi (2007) argued that community participation is one of fundamental principles in public service delivery projects which are designed for sustainable livelihood and development. Whereas Haupt and Khan (2006) emphasize that community participation denotes the readiness of both the government and the community to accept responsibilities and activities. Thus, community participation is the sociological process by which stakeholders physically or socially involve them public projects (Musa and Ifatimehin, 2011). Researchers (e.g., Nyalunga, 2006; Syonga, 2023; Mubangizi, 2007) argued that community participation in initial phase of policy making process to its execution could be very helpful for local governments in managing and execution of any public service projects. Thus the need of local government's commitment to work in a team with local community is very crucial.

No doubt, Pakistan has been focusing on formulating policies and laws regarding the environment, water & sanitation and municipal waste management, however; there is a dire need to introduce environment related education and awareness campaigns and participation of community in solid waste management initiatives for effective management of municipal solid waste and other environment related issues.

3. Research Method

This is a pure quantitative survey research. The Questionnaire adopted from *Guides for Municipal Solid Waste Management in Pacific Countries* (WHO 1996) and Syonga (2023) with some minor modifications (Additions and deletions) and piloted before collecting actual data. After conducting the pilot study face to face data were collected on structured survey questionnaire from 100 contractual employees of Atlas-Pak Waste Management Company Hyderabad, which is working as private contractor in Hyderabad city of Sindh Province. The survey questionnaire consists of seven (07) statements regarding the community participation in activities related to waste management in Hyderabad city. The collected data were analysed through Statistical Package for Social Sciences (SPSS) version 29.0, a powerful tool for conducting various statistical tests and generating reports (Hair et al., 2019), and descriptive statistics mean, standard deviation, frequency and percentage were reported and discussed.

3.1. Participant's profile (n=100)

As culturally and socially cleaning is considered odd and low paid hard working job in Pakistan, therefore, total of survey participants were male. The age construct suggests that half (50 percent) of respondents fall in age category 31-40 years, 45 percent were 20-30 years, 3 were above 41-5 years and only 2 percent were above 51 years of age. A greater number of respondents (80 percent) was sweeper, 10 percent of them were supervisor, 6 percent were coordinator and 4 percent were circle officer. Majority of respondents (62 percent) were trained by the company while 38 percent were not trained and majority of untrained respondents had less than 20 years of work experience. With regard to education level of respondents, majority (68 percent) of respondents were only primary, 21 percent were illiterate, and only 10 percent were graduates (see details in Table 1).

Table 1: *Respondents' Profile (n=100)*

Construct	Category	Frequency	Percentage
Gender	Male	100	100.0
	Female	00	0.0
Age	20-30	45	45.0
	31-40	50	50.0
	41-50	3	3.0
	51 and >	2	2.0
Designation	Sweeper	80	80.0
	Supervisor	10	10.0
	Coordinator	6	6.0
	Circle Officer	4	4.0
Education Level	Illiterate	21	21.0
	Primary	68	68.0
	Matriculation	0	0.0
	Intermediate	1	1.0
	Graduate	10	10.0
Income (PKR)	<30,000	80	80.0
	31000-40000	10	10.0
	41000-50000	6	6.0
	51000-60000	4	4.0
	61000 and >	0	0.0
Work Experience (years)	>1	28	28.0
	1-2	30	30.0
	3-4	30	30.0
	4-5	4	4.0
	5 and >	8	8.0
Trained	Yes	62	62.0
	No	38	38.0
Location	Qasimabad (Zone-1)	22	22.0
	Hyderabad city (Zone-2)	42	42.0
	Latifabad (Zone 3)	28	28.0
	Kotri (Zone-4)	8	8.0

Source: *Researcher's own field survey*

4. Findings and Discussion

4.1. Community Participation

With regard to descriptive statistics for community participation factor, the researchers found a maximum range of mean (2.86) for CP6 and a minimum (1.37) for CP2. Likewise, the researcher recorded a maximum standard deviation (1.337) for CP9 and a minimum (7.92) for CP6 (Table 2).

Table 2: *Descriptive Statistics for Community Participation (CP)*

	CP1	CP2	CP3	CP4	CP5	CP6	CP7	CP8	CP9
Number	100	100	100	100	100	100	100	100	100
Mean	1.41	**1.37**	1.49	1.39	1.41	**2.86**	2.70	2.16	2.52
Std. Deviation	.975	.872	.937	.942	.996	**.792**	.859	1.061	**1.337**

Source: Calculated from data collected through Questionnaire Survey (2026)

Community Participation Item Code (CP1): The respondents' response regarding the item CP1 [**Do you believe that community separates waste before putting in installed bins?**], suggests that an overwhelming majority (n=89 or 89%) showed their disagreement with the statement out of them 81% responses were strongly disagree whereas 8 percent were 'disagree'. Thus, it is an indication that community either has no idea of separate waste before putting in bin or they do not think it is their responsibility (See Figure1& Table 3).

Figure 1: *Community Participation (CP1)*

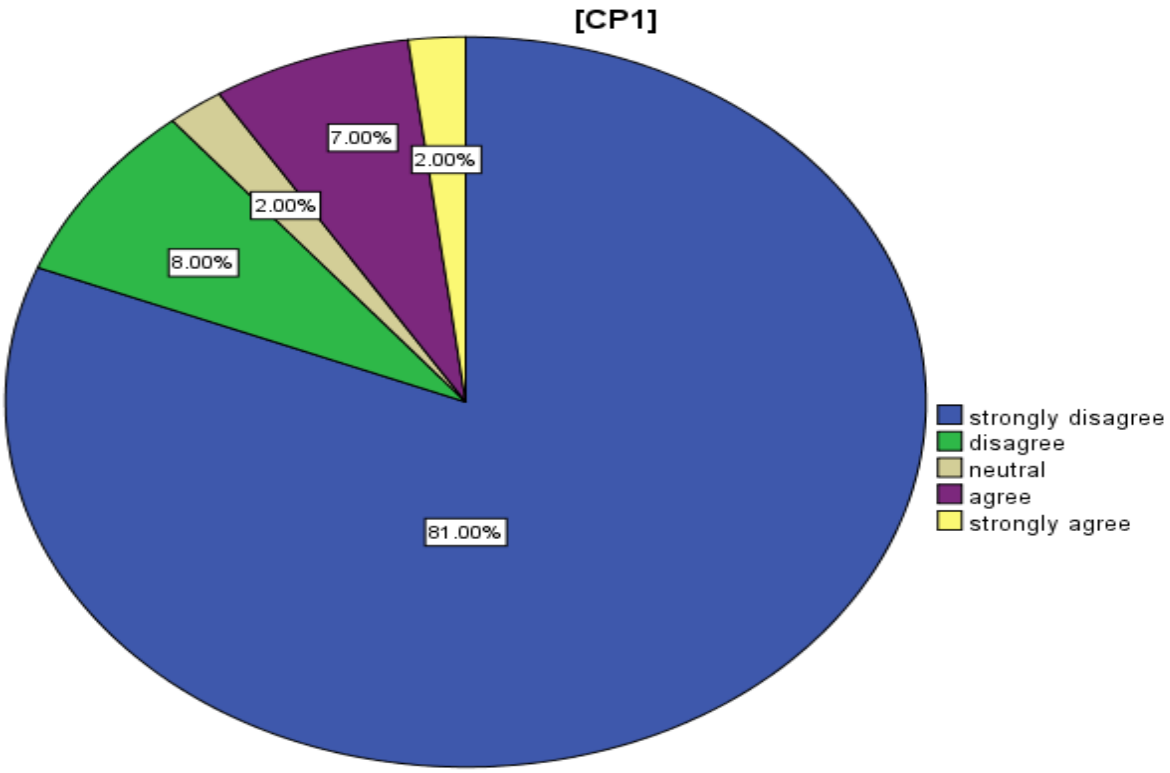


Table 3: *Community Participation (CP1)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP1	Do you believe that community separates waste before putting in installed bins?	SD	81	81.0
			D	8	8.0
			Neutral	2	2.0
			A	7	7.0
			SA	2	2.0
			Total	***100***	***100.0***

Note (s): SD=strongly disagree; D=disagree; N=neutral; A=agree; SA=strongly agree

Community Participation Item Code (CP2)*:** The survey participants' response against the community participation item code CP2 *[Do you believe that community send waste to collection points through sound approach?***]* clearly show that a huge majority (92%) showed its disagreement with the above-given statement. Out of these responses 79 percent were 'strongly disagree' and 13 percent were 'disagree'. Whereas only 2 percent of respondents were in favour of the given statement. The data also showed that the community is not aware of any kind of sound approach of waste transportation to the collection point. (See Figure 2, Table 4).

Figure 2: *Community Participation (CP2)*

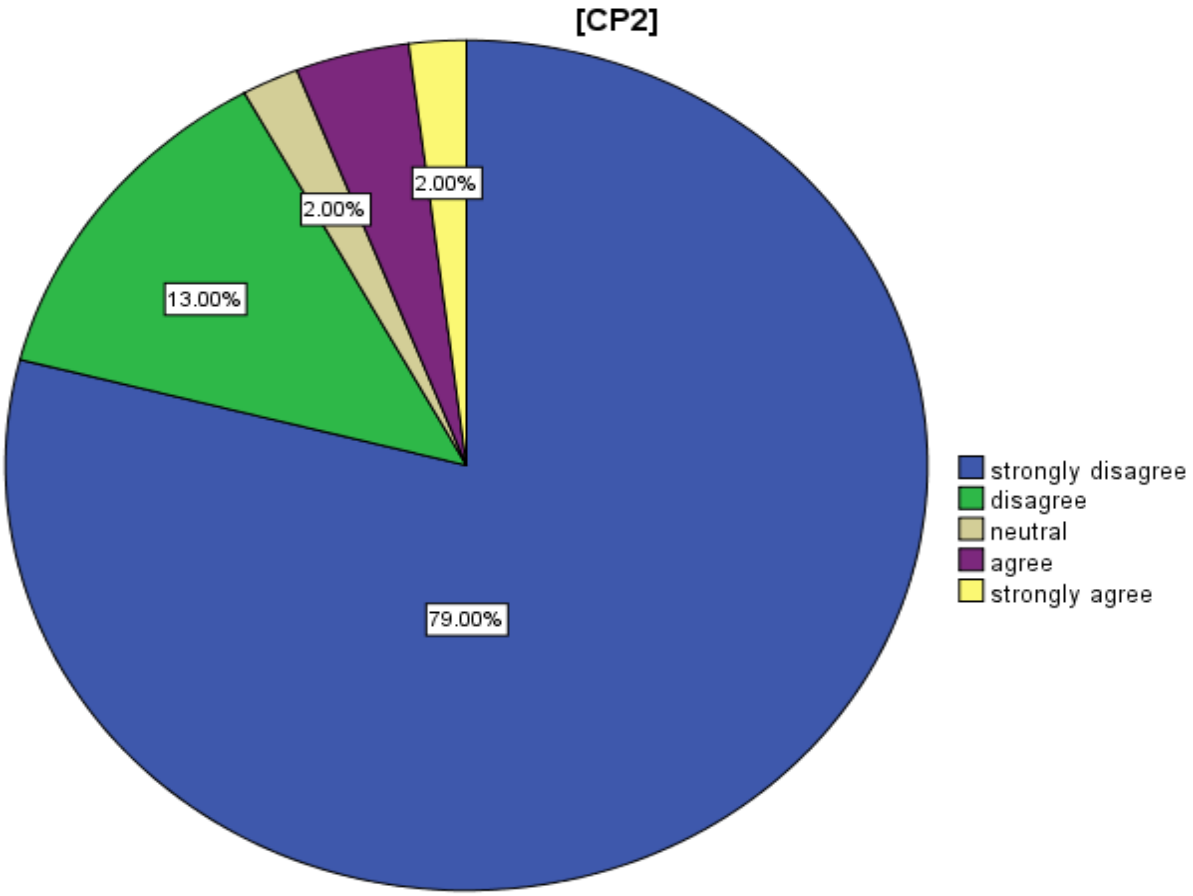


Table 4: *Community Participation (CP2)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP2	Do you believe that community send waste to collection points through sound approach?	SD	79	79.0
			D	13	13.0
			Neutral	2	2.0
			A	4	4.0
			SA	2	2.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=not sure; A=agree; SA=strongly agree

Community Participation Item Code (CP3): The analysed data against the item CP3 ***[Do you believe that community participates in community clean- up programmes?],*** show that 88 percent (SD=72 & D=16) of the responses are in the against off while only 8 percent (A= 7 & SA=1) are in favour of the above statement. It means community do not in activities regarding the cleaning and management of waste in their respective colonies or mohalla (See Figure 3, Table 5).

Figure 3: *Community Participation (CP3)*

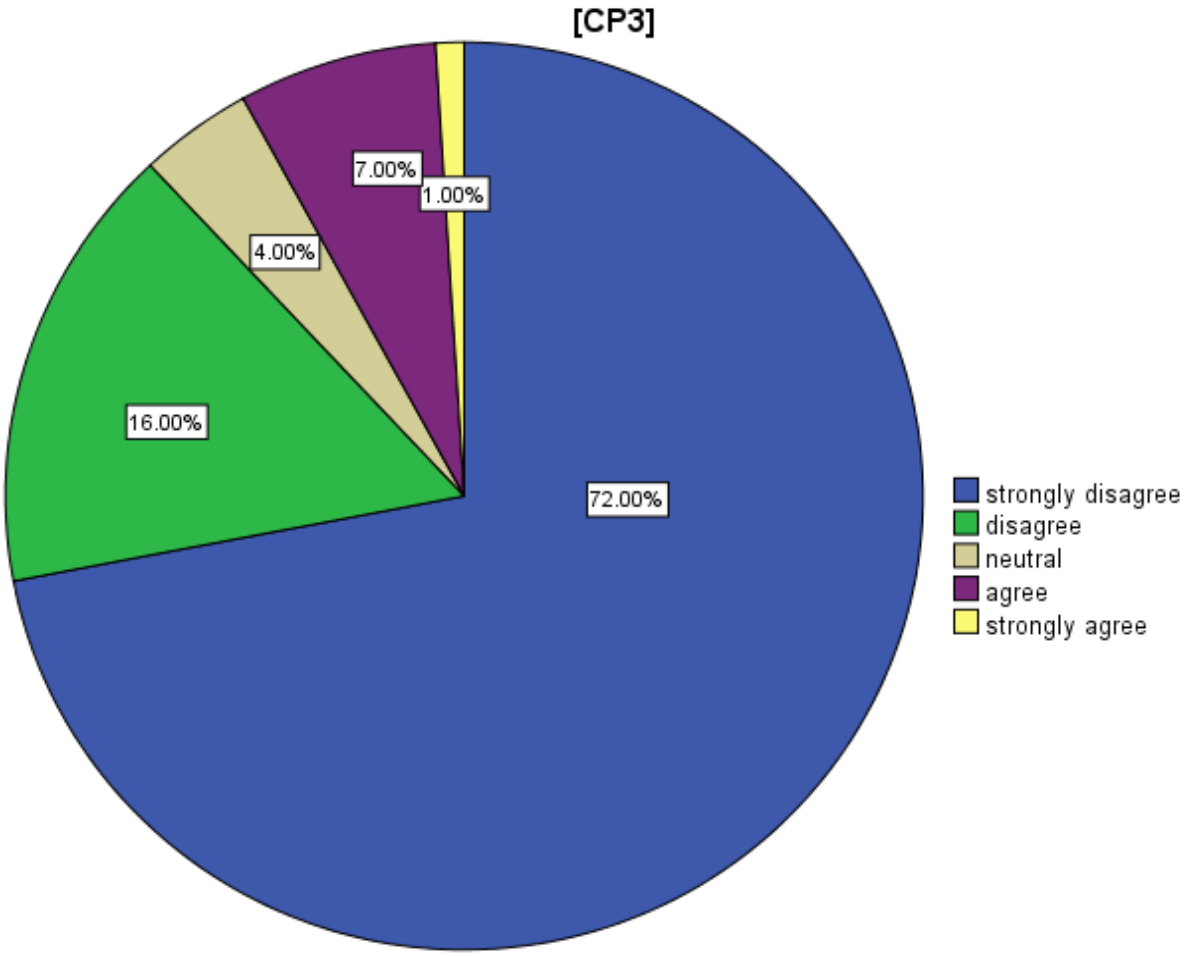


Table 5: *Community Participation (CP3)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP3	Do you believe that community participates in community clean- up? programmes?	SD	72	72.0
			D	16	16.0
			Neutral	4	4.0
			A	7	7.0
			SA	1	1.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=neutral; A=agree; SA=strongly agree

Community Participation Item Code (CP4): The respondents' response regarding the item CP4 ***[Do you think that community is well educated and informed on waste management in its area/mohalla?],*** suggests that a majority of respondents (n=80 or 80%) are strongly disagree, 11 percent are 'disagree', 4 percent are 'agree' while only 2percent are 'neutral' with the above mentioned statement (See Figure 4, Table 6).

Figure 4: *Community Participation (CP4)*

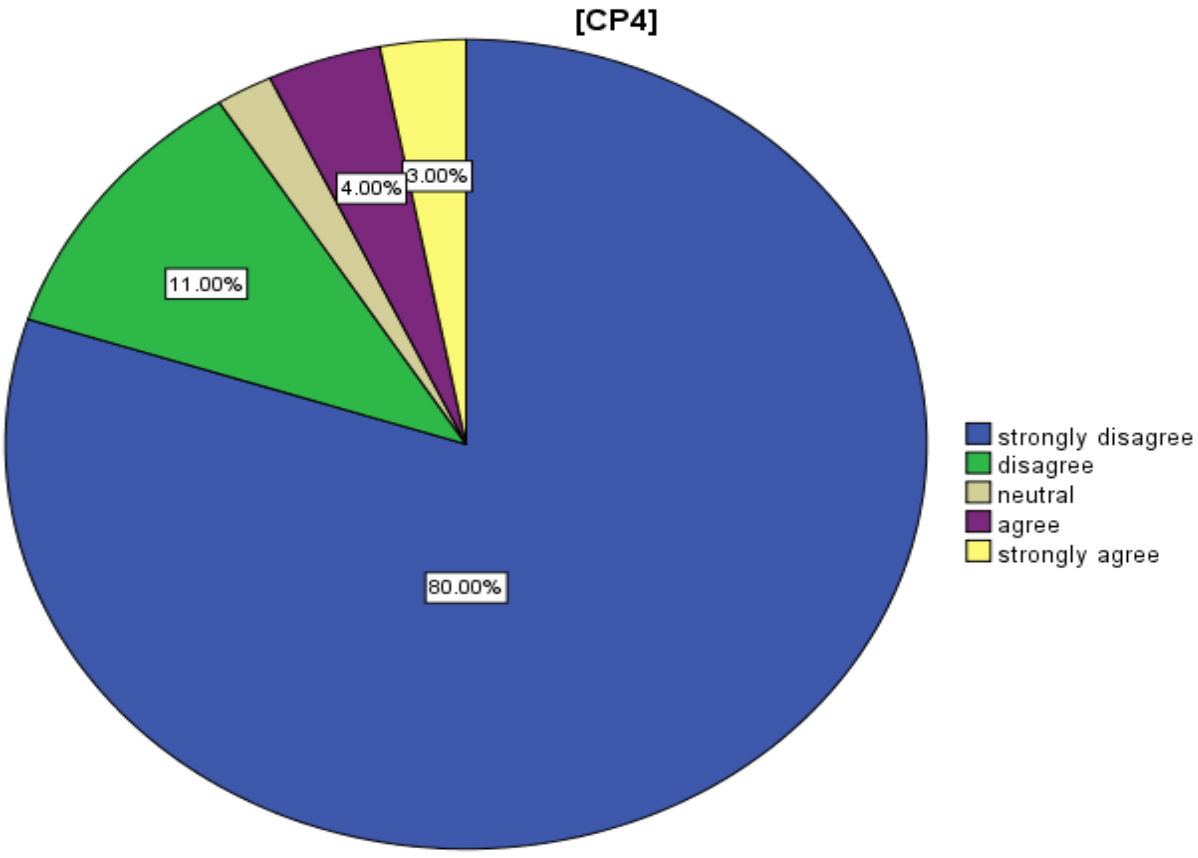


Table 6: *Community Participation (CP4)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP4	Do you think that community is well educated and informed on waste management in its area/mohalla	SD	80	80.0
			D	11	11.0
			Neutral	2	2.0
			A	4	4.0
			SA	3	3.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=neutral; A=agree; SA=strongly agree

Community Participation Item Code (CP5): The respondents' response regarding the item CP5 ***[Do you think that community cooperates with sanitation workers in managing waste in its colony/area?],*** indicates that a huge majority (n=83 or 83%) are 'strongly disagree', 7 percent are 'agree' while only 2percen are 'strongly agree' with the above-mentioned statement. It was also observed that community does not cooperate with the sanitary workers and they are not well treated in some areas or colonies they also face with misbehaviour of community (See Figure 5, Table 7).

Figure 5: *Community Participation (CP5)*

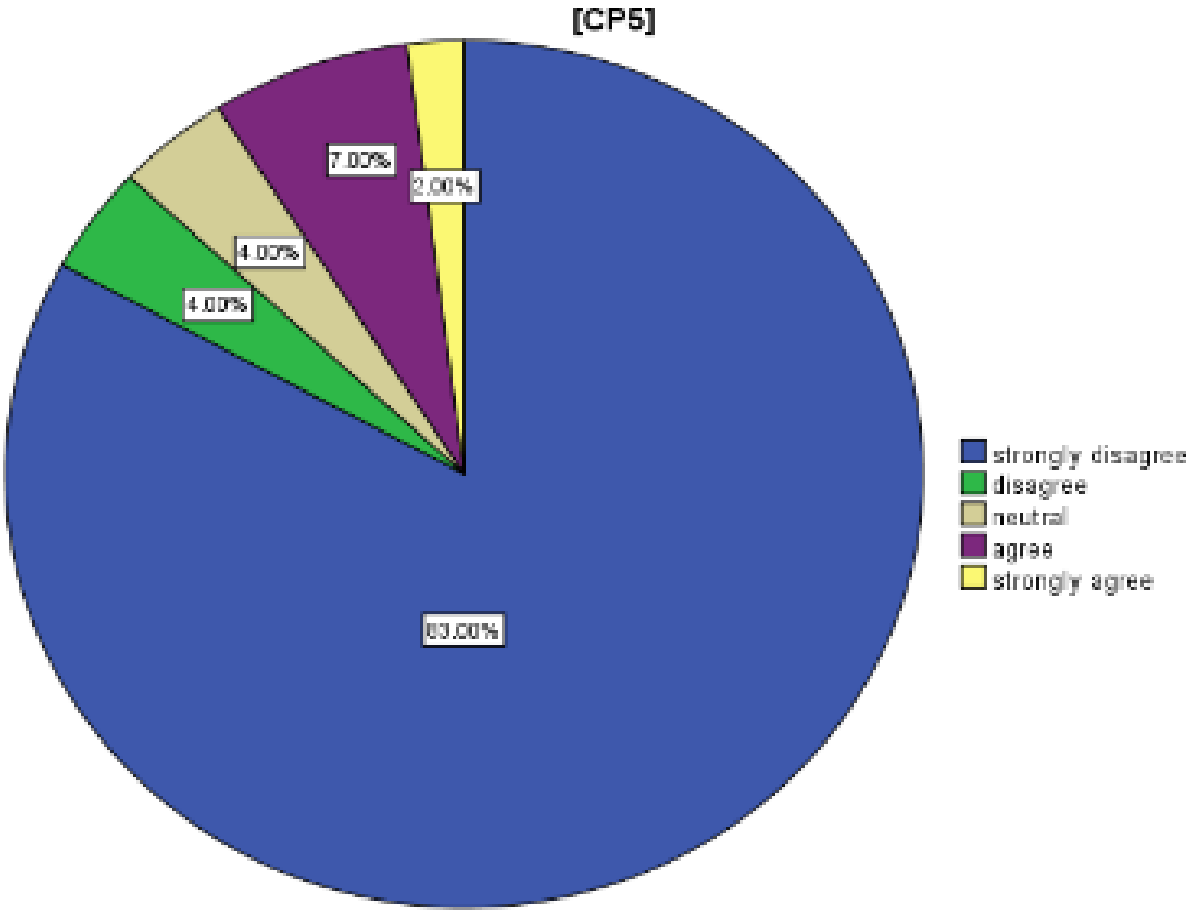


Table 7: *Community Participation (CP5)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP5	Do you think that community cooperates with sanitation workers in managing waste in its colony/area?	SD	83	83.0
			D	4	4.0
			Neutral	4	4.0
			A	7	7.0
			SA	2	2.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=not sure; A=agree; SA=strongly agree

Community Participation Item Code (CP6): The respondents' response regarding the item CP6 ***[Does your company/department arrange awareness campaign for active community participation?],*** suggests that a majority of respondents (n=54 or 54%) are 'neutral' with the statement and minimum (1% or n=1) are 'strongly agree' with the statement. Thus, it is clear that a slight majority of neutral response showed that company either do not arrange awareness campaign as it may not be their mandate. Whereas 18 percent of responses were in favour and 28percent were against the above statement. However, it is found that there is a dire need to arrange awareness campaign so that community participation can be ensured (See Figure 6, Table 8).

Figure 6: *Community Participation (CP6)*

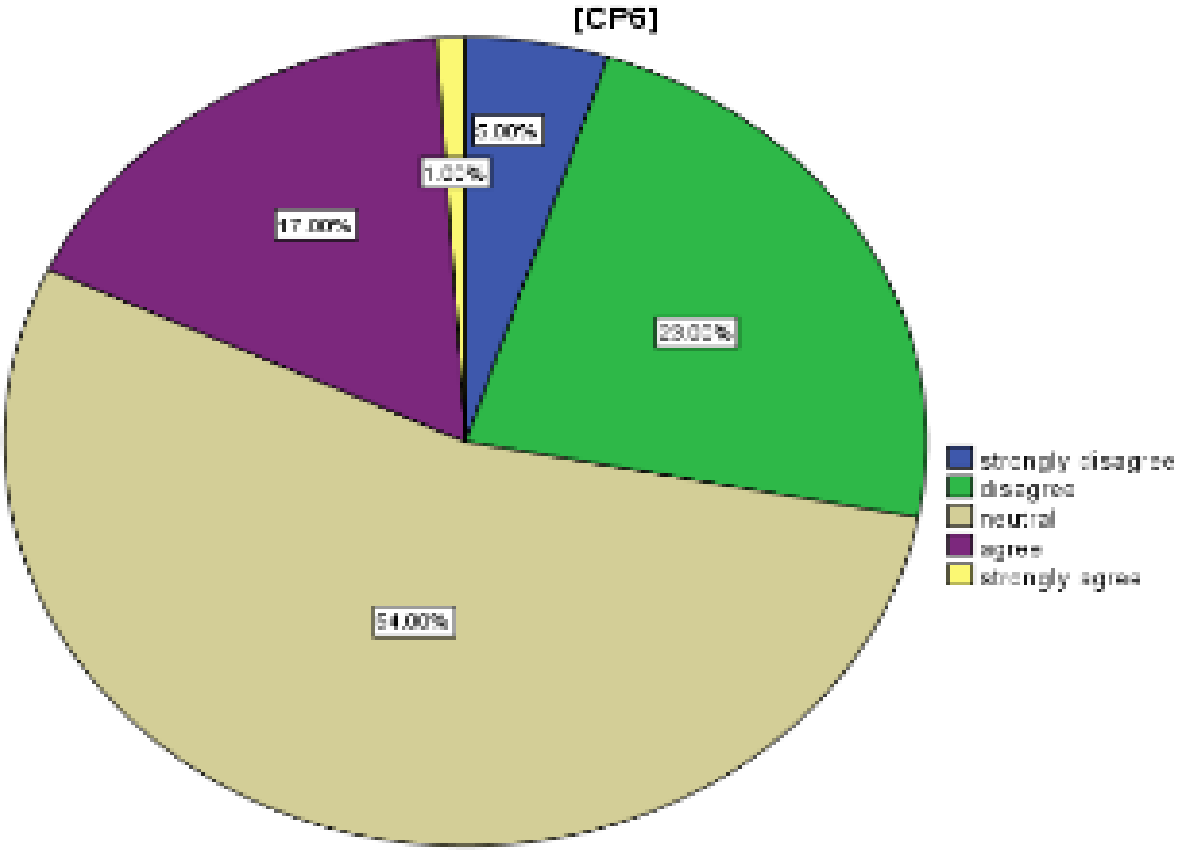


Table 8: *Community Participation (CP6)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP6	Does your company/department arrange awareness campaign for active community participation?	SD	5	5.0
			D	23	23.0
			Neutral	54	54.0
			A	17	17.0
			SA	1	1.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=neutral; A=agree; SA=strongly agree

Community Participation Item Code (CP7): The respondents' response regarding the item CP7 ***[Have you seen community participation in the meetings related to solid waste management?],*** suggests that a majority of respondents (n=57 or 57%) are neutral with the statement and minimum (2% or n=2) are strongly agree with the statement (See Figure 7, Table 9).

Figure 7: *Community Participation (CP7)*

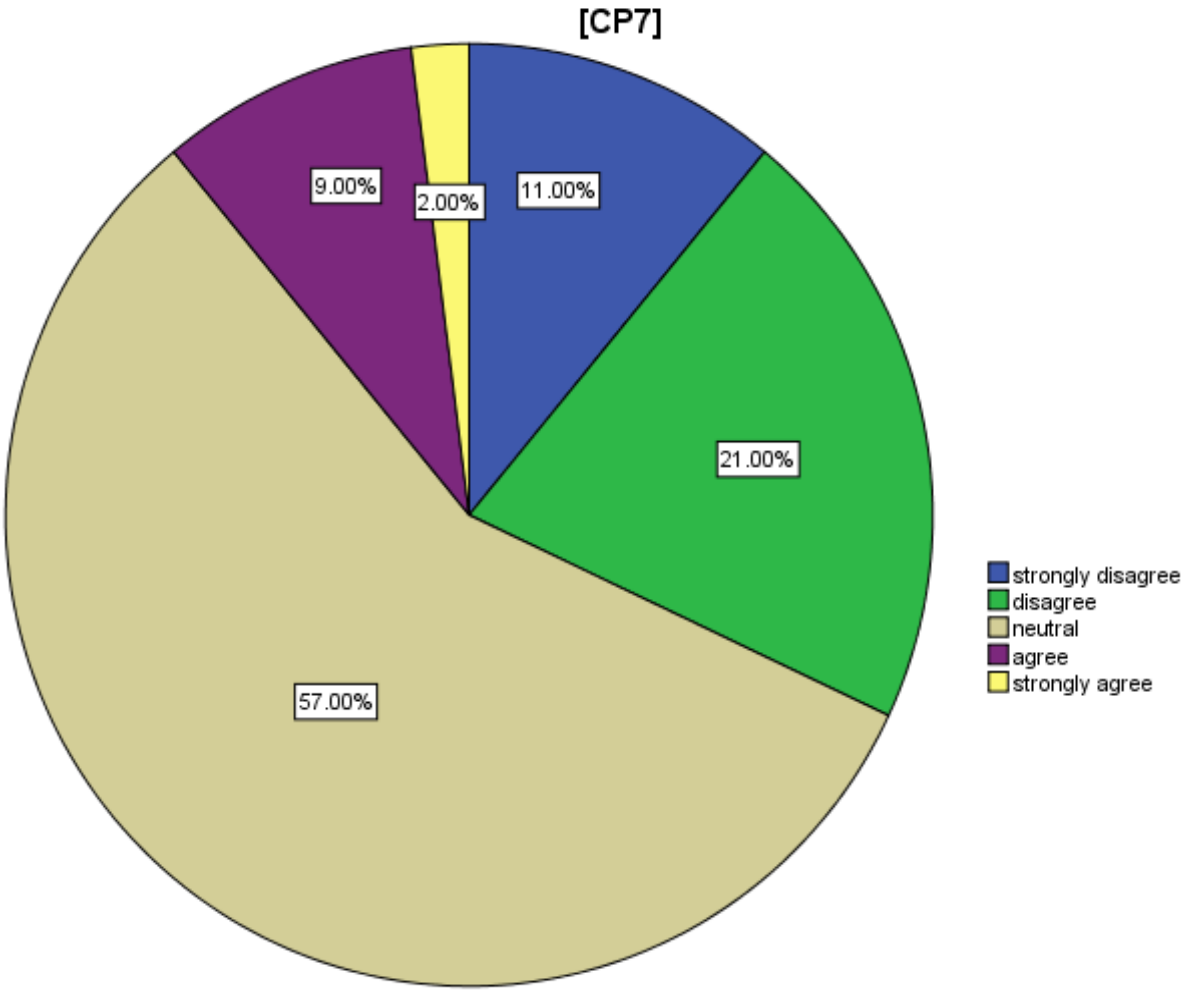


Table 9: *Community Participation (CP7)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP7	Have you seen community participation in the meetings related to solid waste management?	SD	11	11.0
			D	21	21.0
			Neutral	57	57.0
			A	9	9.0
			SA	2	2.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=not sure; A=agree; SA=strongly agree

Community Participation Item Code (CP8): The respondents' response regarding the item CP8 ***[Do you think that community leaders encourage proper waste disposal?]***, suggests that a majority of respondents (n=37or 37%) are strongly disagree with the statement and minimum (2% or n=) are strongly agree with the statement. The data revealed that community leader (including local government representatives) do not take their responsibility to motivate or encourage respective community to involve in waste management activities (See Figure 8, Table 10).

Figure 8: *Community Participation (CP8)*

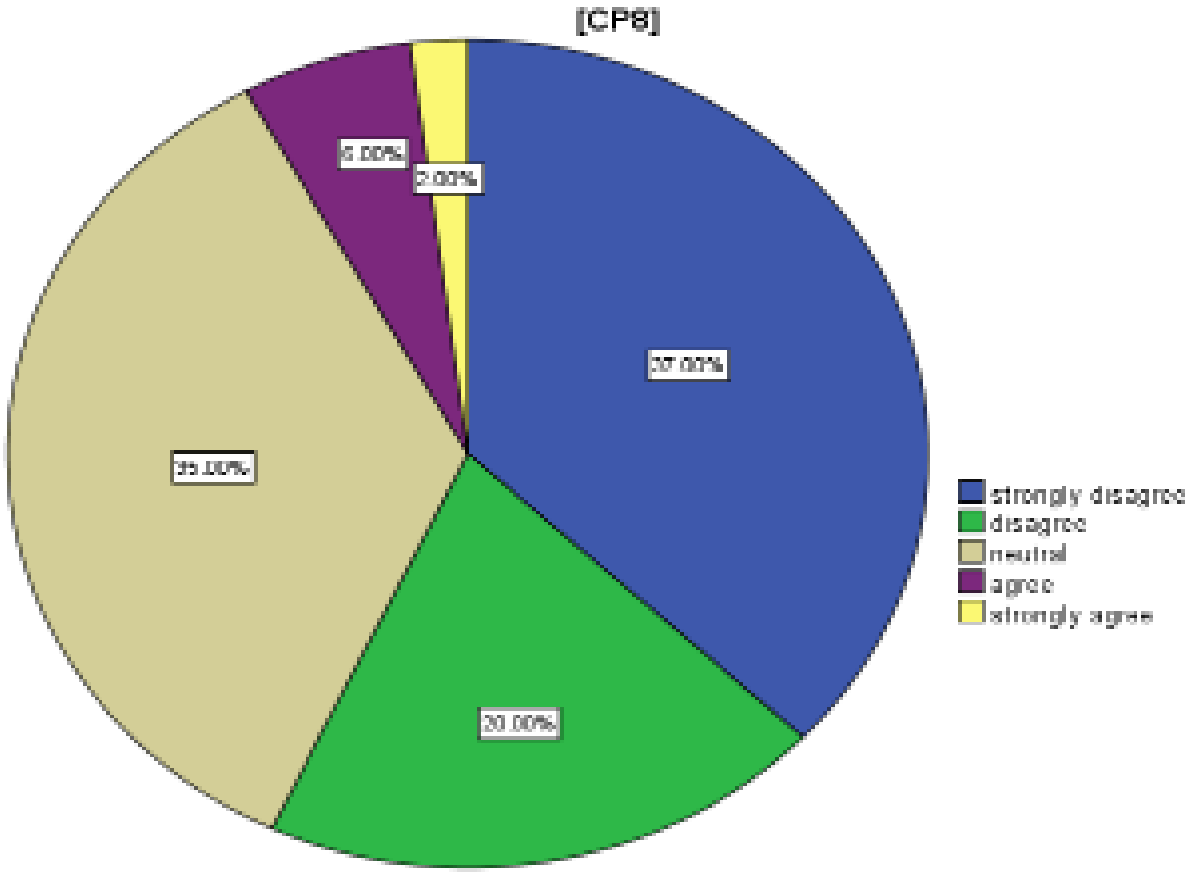


Table 10: *Community Participation (CP8)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP8	Do you think that community leaders encourage proper waste disposal?	SD	37	37.0
			D	20	20.0
			Neutral	35	35.0
			A	6	6.0
			SA	2	2.0
			Total	*100*	*100.0*

Note(s): SD=strongly disagree; D=disagree; N=neutral; A=agree; SA=strongly agree

Community Participation Item Code (CP9): The respondents' response regarding the item CP9 ***[Do you think that there is social pressure to manage waste with due care?],*** suggests that a majority of respondents (n=35 or 35%) are 'strongly disagree' with the statement and minimum (3% or n=3) are 'strongly agree' with the statement. Thus, as per the data there is no social pressure regarding the proper waste management in communities that further show lack of community ownership and sense of responsibility (See Figure 9, Table 11).

Figure 9: *Community Participation (CP9)*

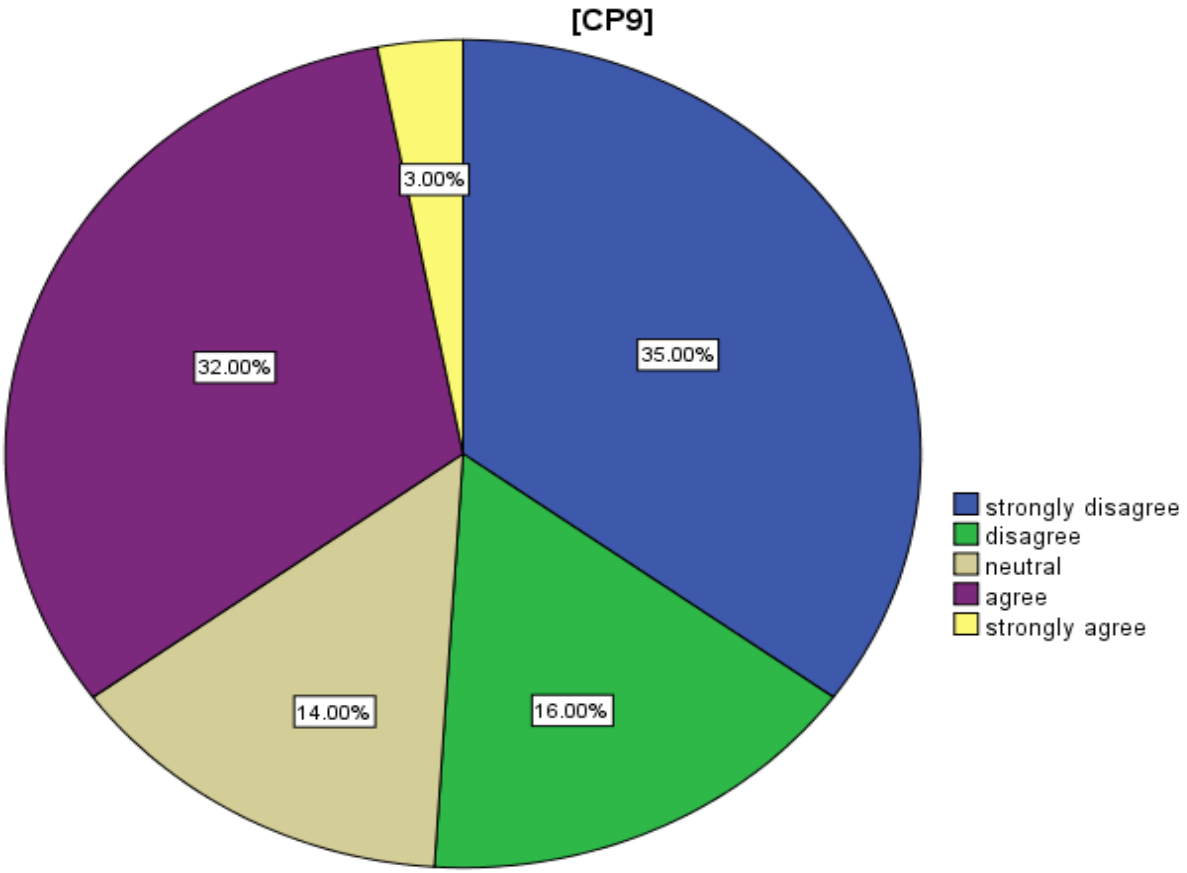


Table 11: *Community Participation (CP9)*

Theme or Factor	Item code	Item description	Scale	Frequency	Percent
Community Participation	CP9	Do you think that there is social pressure to manage waste with due care?	SD	35	35.0
			D	16	16.0
			Neutral	14	14.0
			A	32	32.0
			SA	3	3.0
			Total	***100***	***100.0***

Note(s): SD=strongly disagree; D=disagree; N=not sure; A=agree; SA=strongly agree

Analysis of responses against Community Participation: There were total of 9 statements under Community Participation variable of factor and majority of responses against the seven (07) statements were found 'strongly disagree' and two (02) were 'neutral', which clearly showed the lack of community participation in waste management activities because of lack of environmental education and awareness among community. Further, the responses against these statements also revealed that local community has not been sensitized about environmental health and education and they are not aware of health risks associated with the unhygienic environment. When they were asked about the involvement of community in official meetings regarding the waste management, the slight majority (57%) were 'neutral' (See table 12).

Table 12: *Overall Response against factor Community Participation*

Variable Item Code.	Description	Responses (Per cent)	Item-wise decision
CP1	Do you believe that community separates waste before putting in installed bins?	81	Strongly disagree
CP2	Do you believe that community send waste to collection points through sound approach?	79	Strongly disagree
CP3	Do you believe that community participates in community clean- up programmes?	72	Strongly disagree
CP4	Do you think that community is well educated and informed on waste management in its area/mohalla	80	Strongly disagree
CP5	Do you think that community cooperates with sanitation workers in managing waste in its colony/area?	83	Strongly disagree
CP6	Does your company/department arrange awareness campaign for active community participation?	54	Neutral
CP7	Have you seen community participation in the meetings related to solid waste management?	57	Neutral
CP8	Do you think that community leaders encourage proper waste disposal?	37	Strongly disagree
CP9	Do you think that there is social pressure to manage waste with due care?	35	Strongly disagree

Conclusion

No doubt, the government of Sindh realizing the significance of proper management of solid waste in cities and towns has promulgated Sindh Solid Waste Management Ordinance in 2014 and also provincial assembly passed act known as 'Sindh Solid Waste Management Act 2021. Under this act solid waste management boards at divisional level were established and through public private partnership they are trying to properly manage solid waste in major cities of the province. In Hyderabad city, the Turkish company 'Pak-Atlas Waste Management Company' is responsible for collecting solid waste while the SSWMB Hyderabad is responsible for overall monitoring and supervision. Despite the proper legislation, strategy and involvement of private company, the problem of solid waste in Hyderabad city has not been effectively managed or resolved. The findings of the paper reflecting the previous studies (Liman, Nabegu, & Yusuf, 2025; Iraguha, Handono, & Setyono, 2022; Majid, Jamal, & Asghar, 2022) revealed that lack of civic sense, environmental education and awareness among local community have negatively affected the management of solid waste in Hyderabad city. It was also observed that majority of community does not feel that community is responsible for waste management in their respective locales and

considers that management of waste is a sole responsibility of the government. Paper concluded that to change this cultural and social perception among community there is a dire need to initiate awareness raising activities among local community and in this regard local governments and civil society organizatiosn can play a significance role.

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Conflict of Interest

The authors showed no conflict of interest.

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