

IMPACT OF HI-TECH TOILETS ON PUBLIC SANITATION: AN ANALYSIS

¹Vivitha M.K, ²B.K. Ravi

¹Researcher, Department of Communication, Bangalore University, Bengaluru; ²Chairman & Professor, Department of Communication, Old Pariksha Bhavan, Bangalore University, Bengaluru, INDIA.

¹vivitha.mk@gmail.com, ¹vivitha.mk@mccbbl.edu.in
²bkraivibu@gmail.com, ²bkraivi@bub.ernet.in

ABSTRACT

Passable sanitation along with decent hygiene is a must for maintaining good health. Adequate sanitation facility endorses the healthy living of a community. Decent sanitary practices avert contamination of water, soil and thereby prevent the spread of diseases. The health status of a family has a greater role to play in their livelihood. Understanding this need Government of Karnataka devised an innovative method called the e-toilets.

In Bengaluru alone, there are about 169 e-toilets. These e-toilets are designed to consume less power and water. They are unmanned toilets that self-cleans and works on sensor-based technology. The user has to insert a coin to access it. As they enter the toilet the lights turn on automatically and direct the user with audio commands. But are e-toilets certainly flushing the actual sanitary problems is a question to be asked.

Through this study, the researcher is trying to evaluate the openness of the public to these technological interventions, awareness created by the government about this initiative through various communication channels and its effectiveness. An exploratory technique will be adapted with data analyzed using the quantitative method. The outcome of the study will help comprehend the current scenario.

Keywords: Sanitation, E-toilets, technological interventions, awareness, Communication channel.

INTRODUCTION

Sanitation has been a key priority in India since ancient times. Remnants of toilets have been found in a primeval civilization like the Indus valley. During the colonial rule, there was a decline in the importance given to sanitation facilities. But soon after independence, there have been several missions executed by the central government to improve sanitation facilities. Most of them aimed to exterminate the practice of open defecation across the country. Swachh Bharath Abhiyan is one among them. Under this mission government constructed 1075.66 lakh toilets since 2nd October 2014.

Swachh Bharath Abhiyan has brought about a whole lot of innovation in the sanitation sector. Even private players have come up with a ground-breaking mechanism to tackle the issue. One such revolution addressing public sanitation is E-toilets. Electronic toilets or E-toilets are self-sustainable, technologically advanced and portable sanitation facilities. They work on sensor-based technology with a self-cleaning mechanism. The user has to insert a coin for the toilet to open. These toilets are specifically designed to conserve water and electricity. The toilets are programmed to flush 1.5 liters of water for 3 minutes usage and 4.5 liters if usage is for longer. This smart toilet has an automated system that washes its platform after every five usages. This entire structure is maintained by a GPRS- enabled system.

BBMP launched the e-toilet app on the 24th of February 2016. Using this app people can locate the nearest e-toilets. All the e-toilets located across the city are mapped through this app. This app also has detailed instructions on how to use these toilets. The app will also give details on the health status of the toilets, the water and electricity availability to the monitoring authorities. The users who have downloaded the app and using the facility can give feedback and suggestions to improve the facility. They can also suggest new locations where these toilets can be installed.

This technology was developed by Eram Scientific Solutions, a Thiruvananthapuram-based social enterprise. The company has tied up with several state governments and installed over 2000 e-toilets across the country. The sale comes with a two-year warranty and maintenance. After the warranty period, each unit comes up with a monthly maintenance charge of Rs. 3800 approximately. If these maintenance contracts are not renewed by the local authorities then these toilets stop working.

In Bengaluru, these e-toilets were installed in two phases. 87 of them were custom-built in the first phase in 2014 and 82 of them in the second phase. The toilets that were installed in the first phase are not functional as the BBMP has not renewed the annual maintenance contract. The maintenance of toilets installed in the second phase is poor and so most of them are on the verge of being defunct. It is also observed that these toilets have now become refuge centers for the homeless and stray dogs.

Knowing the current situation of the public toilets, the BBMP has decided to come up with an extensive plan. This plan will enable the identification of more locations for setting up public toilets and also help in maintaining them. They have also decided to improve the maintenance of the already existing urinals so that the public can be benefitted. BBMP is also thinking about providing public yellow spots at the 470 petrol bunks existing in the city. This plan also extends to providing public toilets at BMTC bus stops and metro stations.

To handle the issue of open urination BBMP has come up with, “Shame Campaign”. Eight feet to four feet mirrors are placed in dark spots of the city. This campaign received mixed reactions from citizens. Some lauded the authorities for doing while others commented saying that the civic body could have spent this money in fixing the existing system than buying mirrors. In the due course of this campaign, citizens have posted pictures of e-toilets that are not functional and asked BBMP to fix them.

Theoretical Frame Work

This study intends to build a better understanding of the reasons for people using or not using this facility. This study also tries to look at the existing new media theories like Uses and Gratification Theory and Diffusion of Innovation.

Uses and Gratification theory is a move towards understanding the reason behind people using a particular media to satisfy a particular need. It is a theory giving importance to the users. This theory suggests that users are actively taking decisions and having specific reasons for the usage of a particular media. This theory explains the various reasons why people use media for their needs and gratification. Further, we can interpret that this theory talks about what people do with the media instead of how it influences them.

Diffusion of Innovation is a theory that explains the acceptance of new ideas and technology. It analyses the rate at which people accept new ideas, how they accept them and why they do so. This theory also suggests that four main elements influence the spread of novel ideas: the innovation itself, communication medium, social setup, and the period.

People do not accept new ideas, technology, or product simultaneously in the social setup. Some people are more apt and prepared to accept whereas others take time.

This theory suggests that people can be categorized into five types of adaptors based on their characteristics. Majority of the general population fall under the middle categories. When promoting an innovation different strategies appeal to different target groups. The various categories of people are:

1. **Innovators:** These are the people who come up with the technology. They are enterprising and have new ideas. They are willing to take the risk and very little persuasion is needed for them to start experimenting with the technology.
2. **Early Adaptors:** These are people who are like opinion leaders and they quickly embrace changing opportunities. They are people who are comfortable adopting new ideas. Providing how-to-use manuals and information sheets is enough for them to adopt the new change.
3. **Early Majority:** These are people who are seldom influential. They embrace change before an average person. They typically need to see pieces of evidence about the positive change brought about by the innovation
4. **Late Majority:** These are people who are cynical about any change. They adapt any technology only after it is been experimented with by the majority.
5. **Laggards:** These are people who do not embrace change. They are very conservative. Strategies to appeal to them include fear and pressure.

LITERATURE REVIEW

K.V. Raju and Ravindra Srinivas in the book, “Urban Environmental Governance in India: Browsing Bengaluru” talks about the challenges that the government is facing while implementing any innovative practices. The authors say that the e-toilets are designed to avoid water wastage with every flush. These toilets are equipped with bio-membrane reactors which help recycle the water and reuse it for flushing and cleaning. It is user-friendly and has light indicators to indicate if the toilet is healthy, is in use and if it has water and electricity. The author highlights the fact that these toilets come with a maintenance charge which the BBMP has to renew every year.

In the paper titled, “Research on self-sustained e-toilet for households/ urban semi-urban public/ community sanitation” the authors Vinodh M.S, Baby and Bincy discuss the need for proper sanitation facility for a country like India. They highlight that appropriate maintenance along with regular sterilization of toilets is need to stop the spread of diseases. The paper also discusses the mission of the company is to provide a sanitation facility that is affordable, hygienic, self-sustainable and helps conserve resources like water and electricity. They also talk about the pathway for the development of sustainable sanitation networks.

According to NBC Jan 2019 report talks about the need to develop low-cost, highly efficient toilets that would bring about effective sanitation facilities. The article discusses the recent innovation got about by the European Union-funded project iToilet. These toilets are designed for the elderly and the differentially abled people. It has an auto toilet seat adjustment facility and works on the voice commands given by the user. However, several smart toilets are in the work that would go a step further by offering a window to the health of the people who use them.

In the book, “India CSR report 2019: trends and prospectus of CSR” the authors Girija Srinivasan and Narasimhan Srinivasan talk about the CSR activity of companies like TCS which helps in the maintenance of E-Toilets. The authors say that Surat Municipal

Corporation has come up with four community sanitation units and five e-toilets have been installed. In this chapter, the author talks about the sensor-based technology and self-cleaning mechanism of the e-toilets. The authors highlight the eco-friendly nature of these toilets. This book highlights the benefits of e-toilets.

The authors V. Sudha, N. Jeba and R. Akiladevi in the paper, “A survey on the modern Technologies used in Public toilets” highlight the need for making the sanitation facility inclusive. They discuss the sanitation techniques used for facilitating differently-abled people. This paper also attempts to highlight the need for making optimum use of natural resources and the need to conserve them. The researcher makes a suggestion saying that people have to make effective use of apps launched by the government to register complaints to higher officials if these toilets are not maintained well.

According to the Deccan Herald Nov 2019 report most of the e-toilets installed in the first phase in Bengaluru are not in working condition as the BBMP has not renewed the annual maintenance contracts. Due to poor maintenance, the interiors were rusted with electric wires ripped off and lights broken. Since these toilets are not in working condition, they have become shelter homes for stray dogs. Highlighting the same issue Times of India carried a report in Sept 2019 which talks about how these e-toilets dysfunctional and untidy. It also highlights that these toilets are not suitable for a city like Chennai as most people do not know how to use them.

According to The Times of India, January 2021 report BBMP has decided to improve the maintenance of e-toilets already installed. They have also planned to build 200 more public toilets. BBMP is also planning to come up with fines for those urinating in public places. There are also plans to install more mobile toilets and ask petrol bunks to make their toilets available to the public. In toilets with more than five seats, the BBMP has decided to make a provision for transgender users. It is also discussed that the city is going to have 300 more washrooms in addition to the existing 500.

SIGNIFICANCE OF THE STUDY

Toilets are very pivotal for a healthy community. Clean and healthy communities contribute to the socio-economic development of the nation. Thoughtful about this the government has come up with various missions under the Swachh Bharath Abhiyan. This study tries to understand the success rate of one such mission the e-toilets. This study also tries to look at the effectiveness of the Public Service Announcement by the government in this regard.

OBJECTIVES

1. To find out the awareness among people of the e-toilet initiative.
2. To analyze the usage of the e-toilet app.
3. To identify the drawback of the system if any

METHODOLOGY

This study incorporates an exploratory research design. This method enables the researcher to get the basic knowledge about the willingness of people to use this facility. This also enables the researcher to understand the drawbacks of the system if any and help come with alternatives to make the services better.

The questionnaire is designed with both close-ended and open-ended questions. The questionnaire comprises about 20 questions. The questionnaire is designed to get the profile of the respondents, awareness about the e-toilet initiative, perception of the people regarding traditional toilets and e-toilet.

Sampling

The sample for the present study was selected from Bangalore urban. A simple random sampling technique was used. The questionnaire was shared on the online platform and data collected.

The investigation is also based on the secondary data collected from government reports, expert committee reports, subject-related books, professional journals, media reports, project reports, empirical study materials, dissertations of various universities and Internet-based materials.

Data Analysis

Simple statistics are used to analyze the data. The data is represented using charts.

FINDINGS

The survey was conducted with a total of respondents of 100. It was observed that 44% of the respondents were of the age 18 to 25yrs, another 32% of the respondents from 25 to 35yrs, 22% of the respondents from 35 to 45years and 2% of the respondents from 45 to 55yrs. It is analyzed that people above the age of 55yrs are not frequent visitors to social networking sites. Youth is the one constantly using social networking sites like Facebook and WhatsApp.

When a question on media usage was asked it was noticed that 100% of the respondents poses a TV set with a cable/DTH connection (represented in Figure 1), they also have a smartphone with an internet connection. It was also observed that 83% (represented in Figure 2) of the respondents have a computer or laptop at home. It is inferred that the sample population is digitally abled and has access to technology-enabled devices.

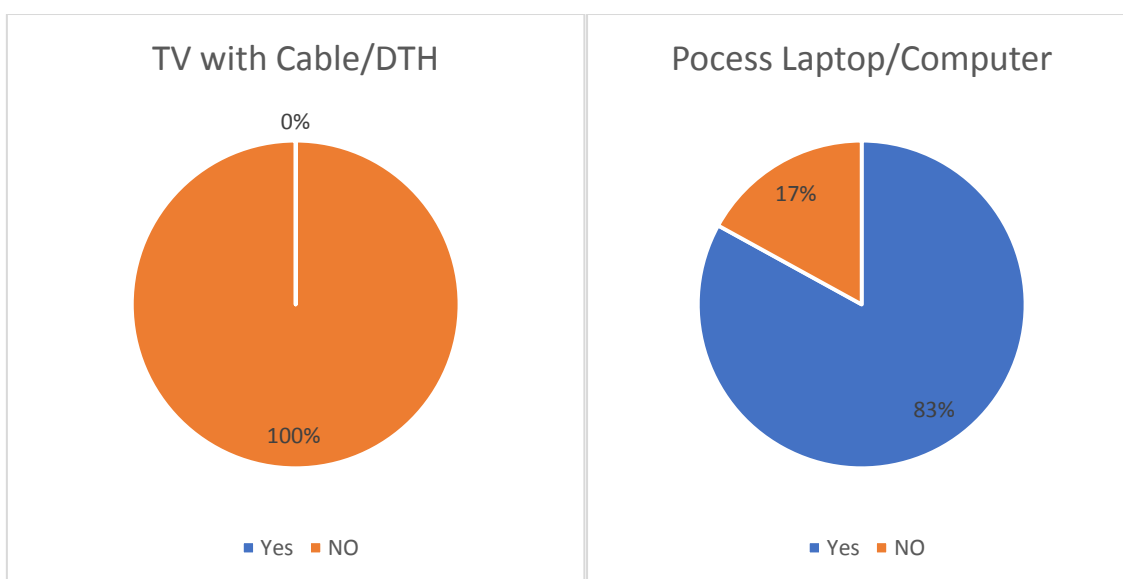


Figure 1

Figure 2

63% of the respondents preferred smartphones to get updates on government policies and regulations, 30% preferred Television and 7% of the respondents said they prefer newspapers to get their updates (represented in Figure 3). The respondents who prefer smartphones said that they get updates from social media platforms like Facebook and Twitter. They also said that they follow social media pages of the government and popular politicians.

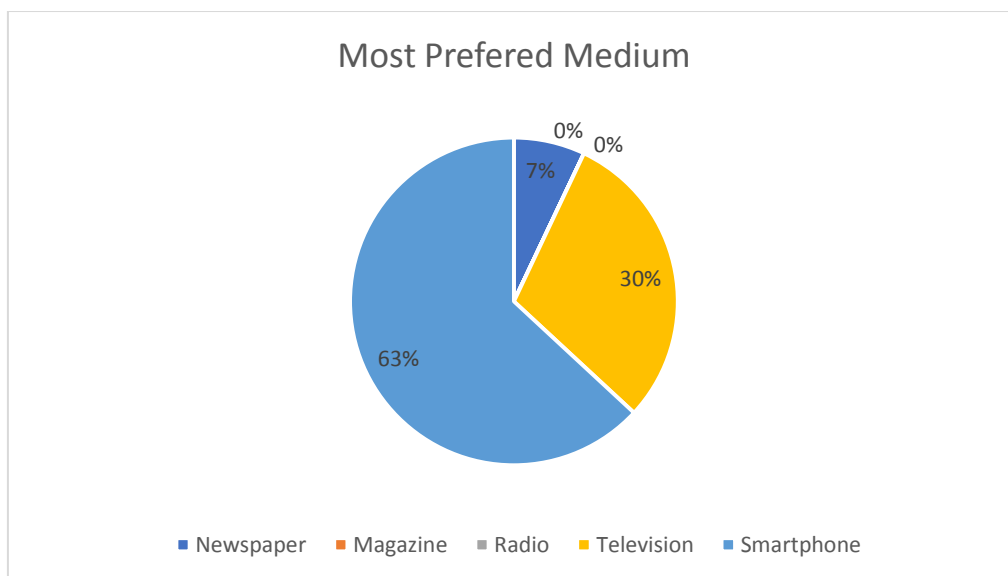


Figure 3

It is observed that 100% of the respondents are aware of Swachh Bharath Abhiyan. About 13% are aware of Nirmal Bharath, 49% are aware of the e-toilets setup in their wards and 83% of the people are aware of Sulabh Public Toilet complexes (represented in Figure 4). Swachh Bharath Abhiyan is the much-hyped scheme under the Modi government. The government strategy to make it a much-noticed scheme has been fruitful. According to the government report, this mission can reduce open defecation by 26%. Based on the number of toilets being constructed the government has declared 28 states and union territories open defecation free.

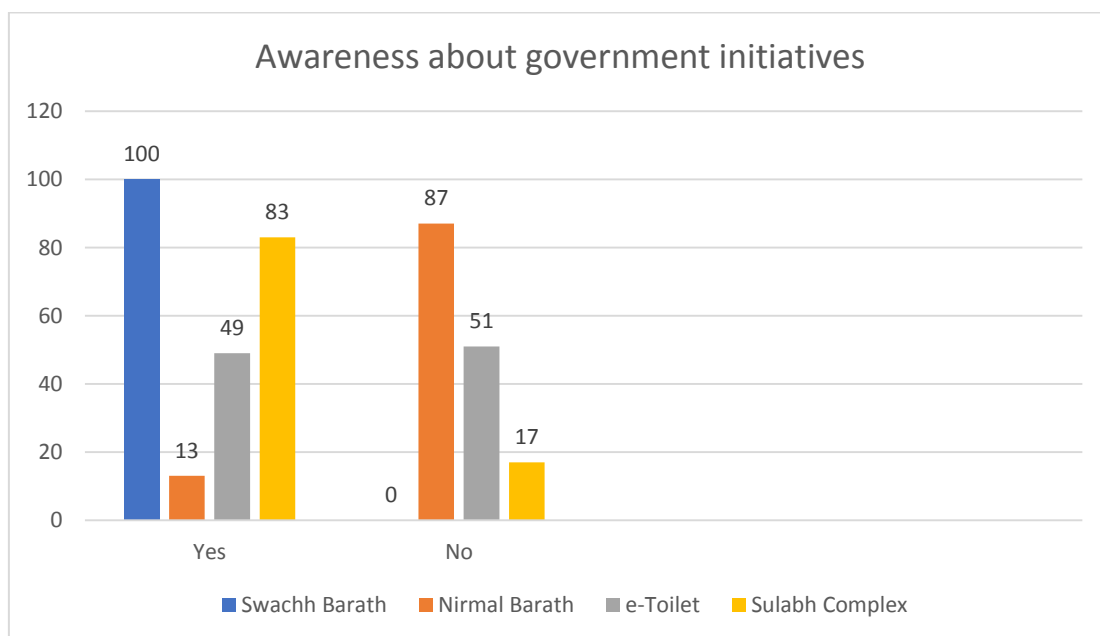


Figure 4

Public service announcements are an important means of creating awareness among people on various issues of concern. Through this survey, it is observed that people are not receiving regular alert messages from the various departments of the government. From the below graph it is seen that Health Ministry and Prime Minister's office are the only two departments reaching out to the public (represented in Figure 5). The other departments are almost

defunct. The platforms that people see messages from active departments are WhatsApp (43%), Facebook (33%) and regular messages (24%). Social networking platforms have become an aery for fake news and the public needs to be aware of it.

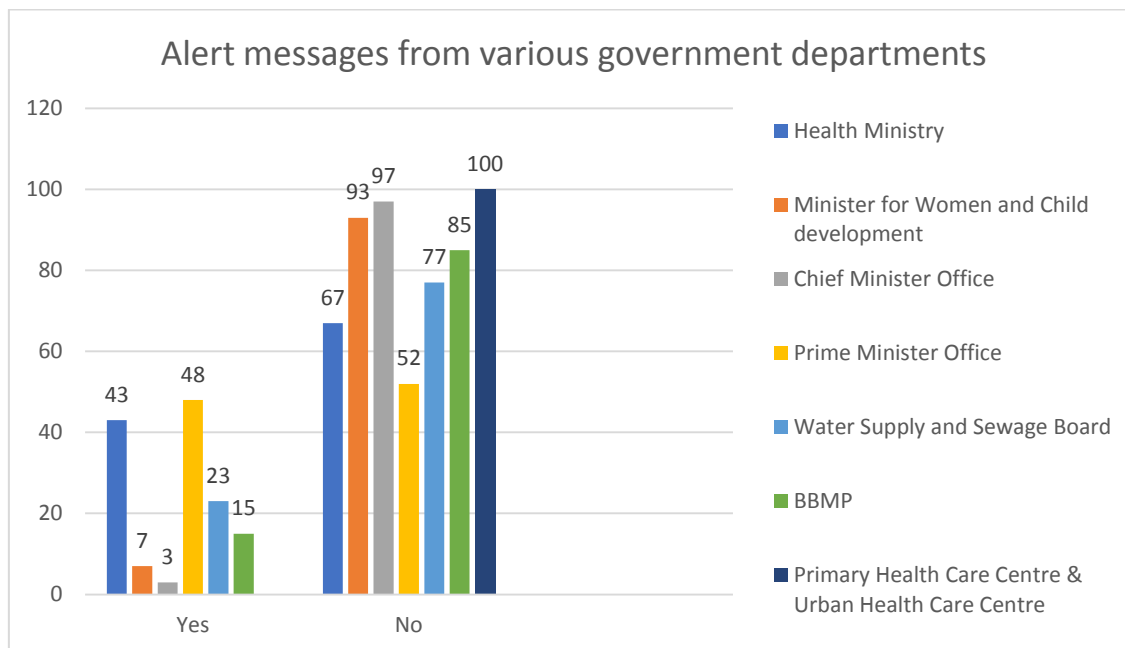


Figure 5

When the respondents were checked on the knowledge of the e-toilet facility, it was found that 49 % of the respondents know about e-toilets but only 20% of them have downloaded the app. This app enables them to locate e-toilets, check their health status and also know if it's functioning or not. It is also seen that only 23% of the population have used this facility out of which only 3% of them prefer e-toilet over traditional toilets (represented in Figure 6). This also tells us that people are reluctant to make a switch from traditional toilets to e-toilets even if it saves water, electricity and is more hygienic.

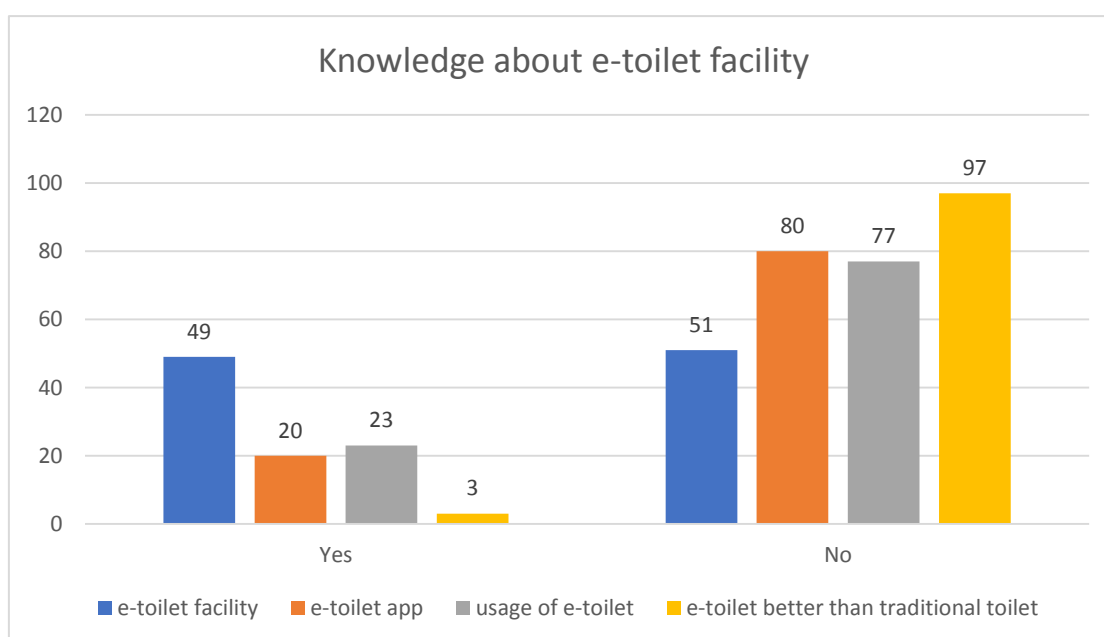


Figure 6

When asked why people prefer traditional toilets over e-toilets it was observed that traditional toilets are comfortable to use as they are accustomed to the system from their childhood. Some people also commented that the overall appearance of the e-toilets is not welcoming and they feel as if it is a complex system to use. Respondents who had to use e-toilets gave feedback saying that the system was not working (45%), instructions not clear (24%) and no maintenance staff so nobody to clear doubts of usage (23%)(represented in Figure 7).

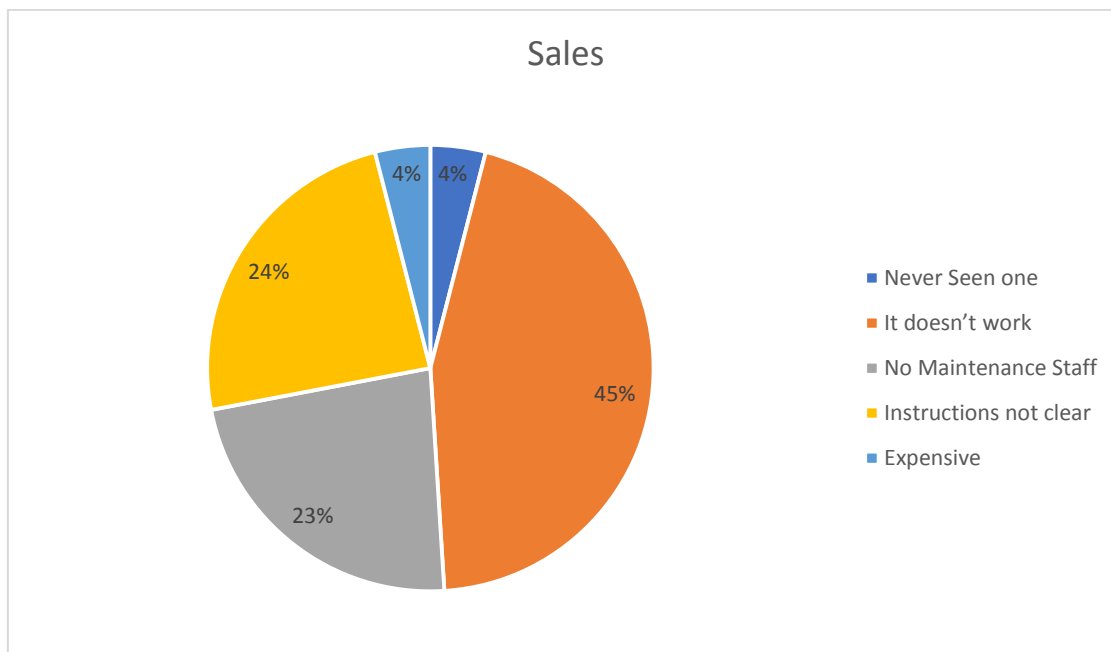


Figure 7

Most of the respondents believed that e-toilets are not maintained properly. The water supply lines are either dry or broken, the electrical wires are ripped off. Some of them thought that the self-cleaning platform sometimes doesn't work even after ten usages.

Limitations of the study

This study has not investigated the working conditions of all the 169 e-toilets in the city. To make the study complete in-depth interview with few officials from Eram Scientific solutions along with BBMP officials involved in this project was necessary but due to time constraints, the researcher was not able to do so. The questionnaire was distributed on the online platform so the opinion of the people who do not access smart devices is not considered.

CONCLUSION

It is observed that timely renewal of the yearly maintenance contract with Eram Scientific Solutions is a must to keep these toilets in working condition. If the placement and design of these toilets are improved then the public might feel more comfortable using them. Even though the company has specifically designed toilets for women and differently-abled, it is less known. The government also has to strengthen its communication process with the public so that awareness is created about these innovative solutions. Only through proper awareness can people make the best use of technological novelties. Improving access to information will increase awareness, engagement and ownership. To make this more effective, states and districts could set up accountability mechanisms such as hotlines or mobile-based systems for users to ask questions and file complaints if they encounter any issue.

REFERENCES

- [1]. Ahuja Aasth. (2020, January 21). *Bengaluru's shame campaign to stop open urination gets mixed reaction on internet from citizens*. NDTV. Retrieved from: <https://swachhindia.ndtv.com/bengalurus-shame-campaign-to-stop-open-urination-gets-mixed-reactions-on-internet-from-citizens-41082/>
- [2]. Akhiladevi R, Jeba N, Sudha V. (2018). *A survey on modern technologies used in public toilets*. International journal of Recent Technology and Engineering. Retrieved From: <https://www.ijrte.org/wp-content/uploads/papers/v7i4s/E2000017519.pdf>
- [3]. Baby, Bincy, Vinod (2016). *Research on self-sustained toilet for households/ urban semi urban public/ community sanitation*. Retrieved from: https://www.susana.org/_resources/documents/default/2-1713-2-1624-baby.pdf
- [4]. Baggaley K (2019, January 23). *Here's how smart toilet of the future could protect your health*. NBC News. Retrieved From: <https://www.nbcnews.com/mach/science/here-s-how-smart-toilets-future-could-protect-your-health-ncna961656>
- [5]. Battacharya A. (2016, April 12). *How to make e-toilets to go to places? B- schools students come up with solutions*. Economic Times. Retrieved From: <https://economictimes.indiatimes.com/news/science/how-to-make-e-toilets-a-go-to-place-b-school-students-come-up-with-ideas/articleshow/51789173.cms?from=mdr>
- [6]. Chitra K.R, Jayasimha, Ramani V (2019, December 10). *Namma Bengaluru: Sanitation for the urban poor: City still has a long way to go*. The Hindu. Retrieved from: <https://www.thehindu.com/news/cities/bangalore/namma-bengaluru-sanitation-for-the-urban-poor-city-still-has-a-long-way-to-go/article30269783.ece>
- [7]. Dutta S. (2017, August 11). *India@70: A Brief Colonial History of Sanitation in India*. NDTV. Retrieved from: <https://swachhindia.ndtv.com/india70-a-brief-colonial-history-of-sanitation-in-india-10602/>
- [8]. Desk. (2019, August 23). *Eram a company the espouses Modi's sanitation priorities*. Kaleej Times. Retrieved from: <https://www.khaleejtimes.com/business/corporate/eram-a-company-that-espouses-modis-sanitation-priorities>
- [9]. Manasi S, Raju K.V, Ravindra A, Ravindra S, Smitha K.C (2018). *Urban Environmental Governance in India: Browsing Bangalore*. US: Springer
- [10]. Pareek S. (2014, September 2). *This toilet is changing the way public sanitation works in India*. Better India. Retrieved From: <https://www.thebetterindia.com/13940/etoilet-changing-way-public-sanitation-works-india-eram-marico/>
- [11]. PTI (2017, January 6). *Eram to install 1500e-toilets in 2017; ties with up TCS*. The Indian Express. Retrieved from: <https://indianexpress.com/article/business/companies/eram-to-install-1500-e-toilets-in-2017-ties-up-with-tcs-4462401/>
- [12]. Reddy Maheshwara R (2020, December 10). *Need more loos? Tell BBMP about it*. Bangalore Mirror. Retrieved from: <https://bangaloremirror.indiatimes.com/bangalore/others/need-more-loos-tell-bbmp-about-it/articleshow/79653776.cms>

- [13]. Singh K (2018, August 2). *Solar-Powered And Self Sustainable, These Are The Toilets India Needs In Metro Cities*. NDTV. Retrieved from:<https://swachhindia.ndtv.com/solar-powered-and-self-sustainable-these-are-the-toilets-india-need-in-metro-cities-15739/>
- [14]. Special correspondent (2021, January 21). *Comprehensive policy on public toilets and maintenance soon: BBMP chief*. The Hindu. Retrieved from:<https://www.thehindu.com/news/cities/bangalore/comprehensive-policy-on-public-toilets-and-maintenance-soon-bbmp-chief/article33662881.ece>
- [15]. Srinivasan G, Srinivasan N. (2019). *India CSR Report 2019: Trends and Prospects of CSR*. US: Sage