

# IMPROVING THE USER EXPERIENCE: a powerful lever to improve sanitation practices in low-income communities

**Bérangère Magarinos-Ruchat**  
Chief Sustainability Officer,  
Firmenich

**Maureen Ravily**  
Manager, Archipel&Co



Community toilets, Pune, India - ©Archipel&Co/ Maja Bialon

Convinced that sustainable development can emerge only through public private partnerships, **Bérangère Magarinos-Ruchat** started her career in the United Nations before joining the Global Alliance for Improved Nutrition (GAIN). She is now Chief Sustainability Officer at Firmenich where she builds strategic internal and external partnerships to enable fragrances and flavors to bring a positive and innovative contribution to sustainable development globally.

**Maureen Ravily** is manager at Archipel&Co, a Paris-based inclusive business accelerator. For the last 10 years, she has been assisting private, public and non-profit organizations in designing, implementing and assessing their inclusive business strategies. Passionate about understanding low-income consumers' habits and preferences, she is in charge of developing Archipel&Co's "Insights" practice.

For the last decades, access to sanitation has been mostly addressed from the "infrastructure" angle: most of the effort has been placed on building sanitation facilities and developing tech-oriented equipment. Whilst these innovations are necessary, they tend to miss a critical issue: the user experience. This article further investigates this issue of user experience by focusing on one specific factor: malodor. It introduces key results from a research run by Firmenich, the Bill & Melinda Gates Foundation and Archipel&Co that explores the role of malodor in sanitation-related decisions in 10 low-income urban settlements in Kenya, South Africa, China and India.

## INTRODUCTION

The need for better sanitation in the developing world is key. 40% of the world's population - or 2.5 billion people - still practice unsafe sanitation or lack access to adequate sanitation facilities, with dramatic consequences in terms of public health and environmental protection. In this context, the international community set an ambitious goal to improve the situation: Sustainable Development Goal #6.2 aims at achieving access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030.

Until now, most of the efforts have been placed on improving access to sanitation infrastructure (the *hardware*). The sanitation community has primarily focused on spending large amounts of money in building toilets (individual in-house toilets or collective ones) and identifying innovative and tech-oriented solutions to improve access to equipment (e.g. container-based toilets, smart toilets, etc.). Whilst these innovations are necessary, they tend to miss a critical issue: the complexity of human behaviors. A variety of sociological, economic and cultural factors influence daily sanitation decisions

and must be considered to ensure existing infrastructure is used effectively. The question of the *user experience* inside the sanitation facility is particularly important: if the experience is poor, chances that people do not to use the facility and prefer unsafe options such as open defecation are high. Consequently, *the software* issue - where infrastructure meets the end-user - is key and should also be addressed: solving the sanitation issue will require putting the human dimension back at the center of the debate.

This is one of the ambitions of the partnership signed between Firmenich, the world's largest privately-owned company in the fragrance and flavor business, and the Bill & Melinda Gates Foundation.

## FIRMENICH – BILL & MELINDA GATES FOUNDATION: A UNIQUE PARTNERSHIP TO IMPROVE USER EXPERIENCE IN TOILETS BY FIGHTING AGAINST MALODOR

Building upon the hypothesis that malodor is one of the key factors leading to a bad user experience in sanitation facilities and might contribute to reduce toilet usage,

the Bill & Melinda Gates Foundation has partnered with Firmenich to further investigate this question. In 2017, following a four-year research partnership supported by the Foundation, Firmenich launched a range of breakthrough malodor control technologies, with the ambition to “reinvent the toilet experience”. These technologies started to be integrated into affordable and sustainable toilet cleaning products targeting low-income consumers across South Africa and Bangladesh in 2018. Through the development of these game-changing toilet innovations, the objective of Firmenich and the Gates Foundation was clear: offering a better user experience in sanitation facilities, in the hope that it encourages people to use existing sanitation facilities instead of defecating in the open. By encouraging people to adopt safer behaviors and “move up” the sanitation ladder (from open defecation to toilets), Firmenich and the Gates Foundation aim at contributing to SDG 6.2.

The new toilet economy can only work if it is supported by positive behaviors and systems: no matter how efficient and innovative toilets can be, if bad smell prevents their usage, they will lack impact. Building upon this strong belief, Firmenich and the Gates Foundation decided to go further and launch a study with the objective to explore the role and impact of odor in sanitation-related decisions in low-income urban settlements of emerging countries.

### 10 locations of the study (in each location, between 1 and 5 low-income settlements were selected)



Figure 1

## COMMUNITY VOICES: AN INCLUSIVE MARKET RESEARCH APPROACH



Community Voices interviewers discussing with a respondent, Kibera, Nairobi, Kenya - ©Archipel&Co/ Maja Bialon

The study was conducted using Community Voices®, a collaborative, inclusive market research approach co-developed by Firmenich, the Naandi Foundation and Archipel&Co. This innovative approach enables the collection of in-depth quality insights, while contributing to local economic development.

Community Voices consists of (1) identifying, training and empowering young adults from underprivileged communities to design questionnaires and interview their peers as to limit declarative bias and strengthen the authenticity of insights and (2) sharing results with communities after the end of the study to empower them, enable them to voice their concerns and make them part of the solution.

This approach has three main positive outcomes:

- **For companies and development organizations:** a unique methodology that provides more accurate and reliable data, enabling to better understand low-income consumers and optimize product development.
- **For the youth:** an innovative approach that empowers young people by creating economic opportunities and building their capacities.
- **For communities:** an inclusive model that aims to voice people's needs and aspirations and encourage them to take action for themselves.

During this study, 5 600 respondents were interviewed by 250 interviewers recruited in local communities.

The study was run by Archipel&Co in 10 low-income settlements across 4 countries (Kenya, South Africa, India and China), with a twofold objective:

- Understand the different factors that drive sanitation-related behaviors of low-income urban communities and the specific role played by malodor in this range of factors: *to what extent can malodor discourage people to use existing sanitation facilities and prefer unsafe options instead?*
- Test the malodor counteractant technology developed by Firmenich and the Gates Foundation: *to what extent can it encourage people to adopt safer sanitation practices and move up the sanitation ladder?*

Settlements were selected upon two criteria: (1) low-income areas (high level of informality, socio-economic issues, lack of access to essential services) and (2) occurrence of unimproved sanitation practices (such as open defecation). Results shared in this article only represent the realities of these selected settlements.

The study was conducted through an innovative and inclusive market research approach called Community Voices (see box below).

Results of this study are shared in this article in the hopes that it might inform public, social and private sector understanding and response to the global sanitation issue.

## MALODOR: A KEY FACTOR DEGRADING USER EXPERIENCE AND INFLUENCING SANITATION-RELATED BEHAVIORS IN LOW-INCOME SETTLEMENTS

### LEARNING #1. MALODOR AND LACK OF CLEANLINESS CONTRIBUTE TO OFFER A VERY POOR USER EXPERIENCE IN COMMUNITY TOILETS AND CAN DISCOURAGE PEOPLE TO USE SUCH FACILITIES

#### SANITATION: A KEY CONCERN FOR SLUM DWELLERS

In low-income urban settlements, sanitation is a key concern. Because of a lack of space and poor infrastructure, the majority of houses is not equipped with individual in-house toilets, and most people still use community toilets (toilets managed by municipalities, NGOs or private companies that are located within the settlement and can be accessed by all households living there).

Sanitation is always spontaneously raised by more than one-third of respondents as “one of the major issues” of the settlement, that should be addressed in priority<sup>1</sup>. It is the primary concern raised in visited settlements in South Africa and China and the secondary concern in India. Complaints include the inadequate type and number of toilets available as well as the bad user experience in existing facilities. Concerns are particularly high amongst

<sup>1</sup> Other issues mentioned by respondents include lack of safety, space, hygiene, water access and employment.



Community toilets in Mathare, Nairobi, Kenya - ©Archipel&Co/ Maja Bialon

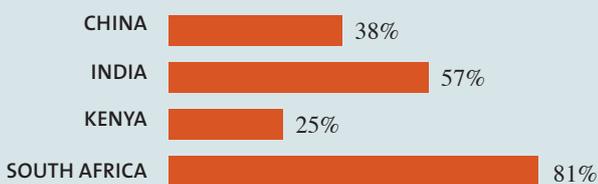
women, who face greater challenges than men when it comes to sanitation. In Kenya or South Africa for instance, safety issues and lack of light at night place women at risk of being raped or attacked. Coping strategies against this include open defecating in groups or utilizing unimproved sanitation options at home, such as buckets that they empty in open areas in the morning. The lack of bins available for sanitary pads and the resistance by community toilets caretakers to remove such items are also deplored by women.

**A POOR USER EXPERIENCE IN COMMUNITY TOILETS, MAINLY DUE TO MALODOR AND LACK OF CLEANLINESS**

Generally speaking, the user experience in community toilets is very poor. In some locations (for instance in South Africa), up to 70 or 80% of users declare having a bad experience when using community toilets.

This poor user experience is mostly due to the bad conditions of community toilets. Malodor and lack of cleanliness are consistently raised as the key issues with such facilities. Complaints include unclean toilet pits, blocked pipes and overfilled septic tanks. Across geographies, similar factors contribute to these bad conditions: overuse, incivilities, lack of water and unmotivated and resource-limited caretakers

**Share of community toilet users that have a bad experience when using the facility**



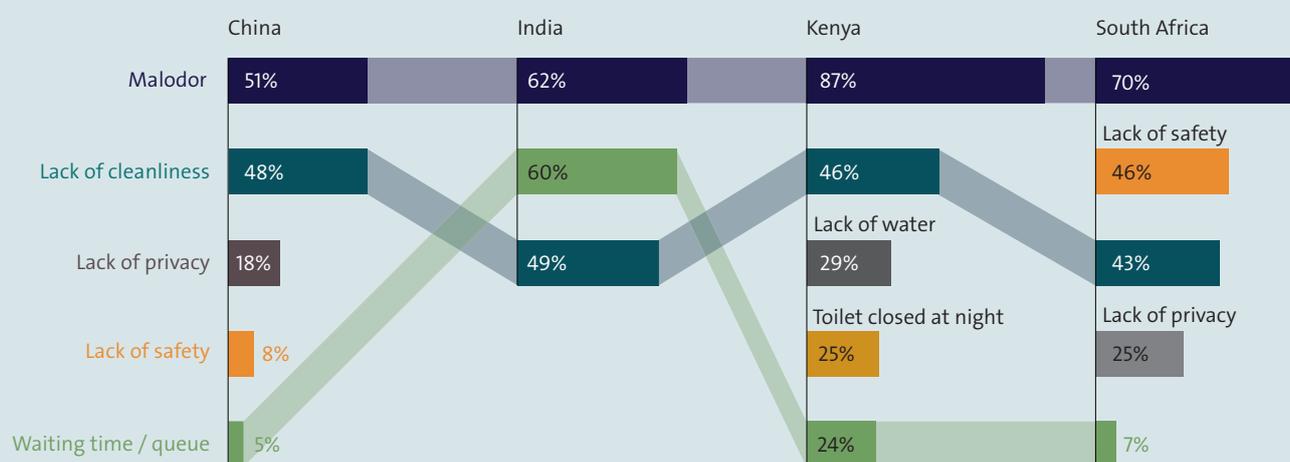
Source: Archipel&Co study, 2019

Figure 2



Community toilets in bad conditions in Alexandra settlement, Johannesburg, South Africa - ©Archipel&Co/ Maja Bialon

### Main issues with community toilets



Source: Archipel&Co study, 2019

Figure 3

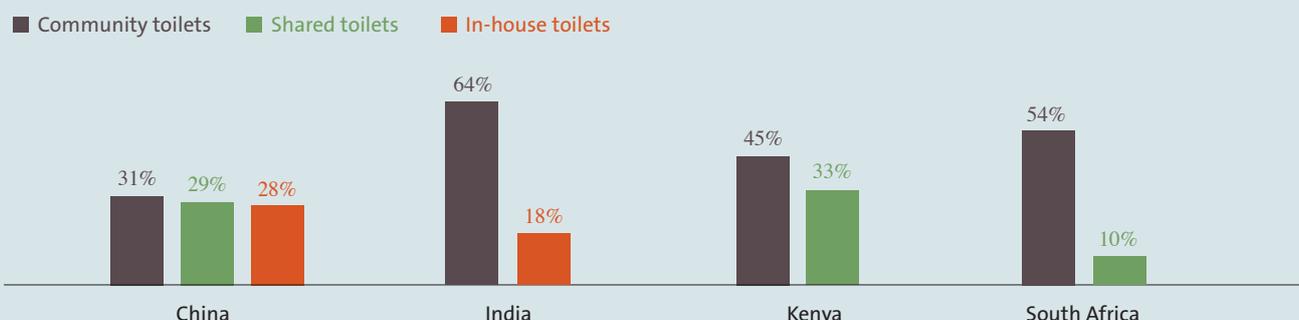
#### THIS POOR USER EXPERIENCE CAN DISCOURAGE PEOPLE TO USE EXISTING FACILITIES AND MAKE THEM PREFER UNSAFE OPTIONS SUCH AS OPEN DEFECTION

One of the key learnings of the study was that this bad user experience can actually discourage people to use community toilets and opt for other options.

In each location, a significant number of people do not use the safest sanitation option available to them but are in fact moving *down* the sanitation ladder and undertaking unsafe practices (i.e. open defecation or bucket used at home and emptied in the open in the morning). Between 31 and 64% of people whose only option is community toilets do not actually use them all the time and practice a less safe sanitation practice occasionally or frequently.

Open defecation is the direct (but not only) consequence of the bad conditions of community toilets. Most open defecators explain that they prefer going in the open rather than using existing facilities because of the bad conditions in which they are. Malodor and lack of cleanliness are often raised as the major issues with community toilets along with waiting time. Almost a quarter of respondents in Kenya and South Africa choose open defecation over toilets due to bad smell. In India, it is almost half of the people interviewed. In Kenya, another driver that encourages people to opt for open defecation or unsafe practices is the lack of an alternate option at night when community toilets are closed.

### Share of respondents who do not use the safest sanitation option available to them but undertake unsafe practices



How to read the chart: in the settlements analyzed in South Africa, 54% of people whose only option is the community toilets do not actually use them all the time and are moving down the sanitation ladder, i.e. are using buckets occasionally or frequently. 10% of shared toilets owners do not use them and can also use buckets.

Source: Archipel&Co study, 2019

Figure 4

## LEARNING #2. IMPROVING THE USER EXPERIENCE IN COMMUNITY TOILETS - BY SOLVING MALODOR ISSUES - IS POSITIVELY WELCOME AND CAN HAVE A SIGNIFICANT IMPACT ON FREQUENCY OF TOILET USAGE

Considering that malodor strongly affects the user experience in community toilets, the second objective of the study was to assess whether a malodor counteractant technology such as the one developed by Firmenich and the Gates Foundation could contribute to improve the situation and encourage people to adopt safer sanitation behaviors.

Two experiments were run to validate this hypothesis:

- A “watch-&-tell” test
- A “real-life conditions” test

### THE “WATCH-&-TELL” TEST

A dedicated test was designed to assess the reactions of community toilet users and open defecators to the technology developed by Firmenich and the Gates Foundation. People were asked to visit toilets that had been treated with the technology (cleaning treatment + installation of air freshener pads) and to react. Answers to this test were only declarative.

This test aims at assessing:

1. whether the technology could encourage people with unsafe sanitation practices to start using community toilets
2. whether current users of community toilets would be ready to pay more to access toilets in such conditions.



An air-freshener pad treated with the Firmenich-Gates malodor counteractant technology installed in a community toilet for the test. The pad captures malodorous molecules and in turn releases a pleasant fragrance - © Archipel&Co/ Maja Bialon

Three key results are noteworthy:

- An overwhelming majority of respondents perceived the treatment to be effective: around 90% consider the situation “*much better than usual*”.
- Addressing malodor can encourage those with unsafe sanitation practices to move up the sanitation ladder: between 35 and 37% of people with unsafe sanitation practices declared a willingness to start using community toilets in improved conditions (cleanliness and good smell)
- Most of community toilets users are willing to pay to access community toilet in improved conditions: in India and Kenya, where people are used to pay to access to community toilets, around 70% of respondents declared being willing to pay *more* to access toilets in such conditions. In China and South Africa, where toilets are currently free of charge, the percentage is lower. Still, 28% of people in South Africa said they were ready to start paying to be able to use toilets in such conditions.

This test demonstrated that an improved user experience can actually contribute to improve the sanitation situation, by (1) shifting behaviors of current open defecators to begin using existing toilets and (2) improving willingness-to-pay for toilet usage among existing toilet users (hence, improving the economic model and maintenance conditions of these toilets).

Nevertheless, it is important to keep in mind that these effects will vary according to the local situation and the other challenges the communities may experience. Three clusters of settlements can be identified:

1. In settlements where availability issues (toilet closing at night and long waiting times) are not solved → limited effect

In settlements which have acute difficulties in toilet availability, and hence a relatively high prevalence of unsafe practices, improving the user experience will likely have a limited effect if waiting time and other access concerns are not addressed (which implies the need to build additional toilets - new facilities or additional stalls within existing facilities). In South Africa for instance, the lack of safety is a major concern and accounts for movement down the sanitation ladder at night and thus improving user experience in public toilets will not have an effect on changing these behaviors.

2. In settlements where unsafe practices are common and user experience is bad → considerable effect

This cluster occurs in settlements where a substantial number of people have unsafe practices and the difficulties associated with toilets are relatively moderate (such as malodor, cleanliness, general maintenance concerns etc.). Improving the user experience in these community toilets could have a considerable effect on both reducing unsafe sanitation practices (i.e. open defecators will use community toilets) and increasing the willingness of existing users to pay .

### 3. In settlements where toilets are in rather good conditions à limited effect on toilet practices (a “last-mile” solution to become open defecation-free), but a considerable impact on social cohesion within settlements

The last cluster of settlements have toilets that are in relatively good condition and subsequently have a relatively low occurrence of unsafe practices. The toilets are effectively managed by community-based organizations (as in Kenya) and are used by most of the community. Treating the odor issue in these toilets will have a limited effect on the reduction of unsafe practices as those who have such practices do so due to specific availability challenges (security and closure at night). However, the malodor treatment is appreciated by existing toilet users and most declared an increased willingness to pay if toilets were in improved conditions.

#### THE “REAL-LIFE CONDITIONS” TEST

### METHODOLOGY OF THE TEST



Organization of the test in community toilets, Pune, India - ©Archipel&Co/ Maja Bialon

The test was performed in 8 community toilets with similar characteristics and comparable initial conditions. We used scanner counting devices to assess and compare the attendance in community toilets before and after treatment (use of cleaning products containing the malodor counteractant technology), in order to quantify the impact of these interventions on behavior change. Two toilets served as control groups (no treatment).

The test was organized in three-steps:

- 1. Period 1 - Pre-intervention (6 weeks):** no treatment as to capture the regular attendance in the 8 community toilets (control period)
- 2. Period 2 – “Cleaning” (6 weeks):** cleaning and odor treatment
- 3. Period 3 – “Cleaning + community engagement” (8 weeks):** cleaning and odor treatments + community engagement activities (awareness-raising campaigns, community events, etc.)

Aware about the potential limitations of the first test (that might include a declarative bias), we ran a second test over a 6-month period in order to assess the potential impact of the malodor counteractant technology on behavior change “in real-life conditions”: if community toilets receive malodor counteractant technology and cleanliness treatment, what impact could this have on users’ actual behaviors? This test was run in Pune (India) but findings are interesting to develop and scale-up solutions in other parts of the world, including on the African continent.

There are three main lessons to be learnt from this test:

- **Lesson #1 - Improving the conditions in community toilets is highly valued by people:** satisfaction levels on general cleanliness and smell have more than doubled during the pilot test in all treated community toilets.
- **Lesson #2 - Improving user experience can lead to behavior change:** the number of people attending the treated facilities increased by 16% between period 1 and period 3. Concurrently, traffic in the control group toilets stagnated or slightly increased (1% increase). This confirms that behavior change can happen: if conditions of community toilets are improved, people are ready to start using them or to use them more often.
- **Lesson #3 - Behavior change requires long term community engagement.**

During period 2, traffic in community toilets started to increase, albeit very modestly (+2%). The real change occurred in period 3 when several actions were launched to engage communities and raise visibility of the intervention. After these engagements, traffic increased almost immediately at a much faster pace (+16%) emphasizing the absolute necessity of actively engaging communities during the process to ensure behavior change can happen. Other experiments show that behavior change curve often follows an exponential curve: as word of mouth increases, it encourages people to imitate what their neighbors do. Hence, we can hope that if the test had lasted longer, results would have continued to increase.

## CONCLUSION AND RECOMMENDATIONS FOR THE SECTOR

This research project by Firmenich and the Gates Foundation reminds how important the concept of “user experience” is when it comes to sanitation decisions. If all the investments and innovations launched to improve sanitation *infrastructure* remain absolutely critical, it is key not to forget that sanitation practices are not only about infrastructure. They are deeply influenced by human factors, immediate perceptions and feelings, rational or irrational drivers that lead people to choose a practice or another.

This study provides strong evidence of the positive impact of enhanced odor and cleanliness on sanitation behaviors: an effective malodor control can significantly improve the user experience in community toilets, and thus increase the

## Evolution of the number of people attending the treated community toilets on a daily basis



Increase in attendance rate is much higher when community engagement actions are conducted.

**How to read the chart:** Before we started to intervene, the community toilet registered an average of 1,264 entries per day (nb.: if a person uses the toilet twice a day, it represents 2 entries). In period 2, when we cleaned and put air freshener pads, it went to 1,290 entries per day (+2% increase). In period 3, when we added the community engagement activities, the number of entries increased much more rapidly, to reach 1,472 entries per day (+16% compared to period 1).

Source: Archipel&Co study, 2019

Figure 5

use of such facilities. This shows that simple triggers can be activated in order to successfully influence behaviors and promote the adoption of safer practices, along with other measures.

We encourage practitioners working in the sanitation space to further investigate these issues. In particular:

- **Shift mindset from “access to toilets” to “access to nice-to-use toilets”.** This requires a twofold effort:
  - Continue to invest in infrastructure by (1) properly maintaining and improving existing facilities (e.g. community toilets), (2) supporting the construction of individual in-house toilets, when it is feasible and relevant and (3) developing new infrastructure, more adapted to low-income settlement realities, such as waterless or container-based options.
  - In parallel, put more focus on the “user experience” to make sure existing facilities are actually used by people. Emotional and behavioral components of the sanitation topic should be considered by policymakers: customer centricity is a key condition of success. Beyond the question of odors, that is developed in this article, other factors contributing to a nice user experience should be further investigated: safety, intimacy, price, additional services, etc.
- **Promote the development and use of cleaning products that include malodor counteractant technology.** Firmenich teams are available to discuss and open to launch tests in order to further assess the potential of the technology in other geographies.
- **Create the conditions for appropriate use of such products in order to have a positive and real impact on behavior change.** Two key factors are particularly important:
  - **Community engagement:** spend time engaging local

communities to foster and entrench behavior change over the long term. Old habits die hard and behavior change never happens in one day – especially when it comes to sanitation, which is a deeply personal and cultural topic. In order to progressively encourage people to change their practices, large and diverse community engagement campaigns should be launched in targeted communities (activities with children, support to key influencers, educational campaigns, gaming strategies, etc.). In any case, they require to build trust and long-lasting relationships with local communities, which is a time- and resource-consuming effort. Consequently, organization and funding of such activities should be considered early in the process by the organizations in charge.

- **Caretakers mobilization:** caretakers are key players of the sanitation value chain that are insufficiently incentivized today. Experience shows that when they are properly motivated and recognized, they are much more effective in maintaining clean facilities, and can even contribute to raising awareness among their communities. Beyond financial incentives, social recognition and other social incentives should be considered to strengthen their self-esteem and image in the community and to empower them over the longer term (e.g. health insurance, training support for their children’s education, etc.). Funding of such incentive models should be taken into account in the business model of community toilets.

Full report with detailed results of the study: *Malodor and sanitation behaviors in low-income settlements (global report)*, Archipel&Co, January 2020

<https://gatesopenresearch.org/documents/4-6>