



What motivates rural riverine residents to adopt toilets? Findings from Central Amazon

O que motiva ribeirinhos rurais a adotarem sanitários? Achados da Amazônia Central

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ABSTRACT: In the Brazilian Amazon, almost 4 million people lack access to adequate sanitation services, and part of this population still practices open defecation. To contribute to successful public policies, this article explores the factors that motivate rural riverine residents from Central Amazon to adopt and/or use toilets. From interviews, Focus Group Discussion and Content Analysis, it was verified that the main motivations are comfort and convenience in using a toilet and the protection it offers against dangerous animals or when it is raining. It was also found that privacy is a strong and authentic motivation for women, and that it meets the Sustainable Development Goals. These results contribute to regionalized sanitation programs, which must take into account the opinion of those who benefit from the implementation of sanitation social technologies.

Keywords: sanitation; qualitative research; floodplain; flooded areas; SDG 6.

RESUMO: Na Amazônia brasileira, quase 4 milhões de pessoas não têm acesso a um serviço de tratamento de esgoto adequado, e parte dessa população ainda pratica a defecação a céu aberto. Para contribuir com políticas públicas de sucesso, este artigo explora os fatores que motivaram os ribeirinhos rurais da Amazônia Central a adotarem e/ou usarem sanitários de forma continuada. A partir de entrevistas, grupos focais de discussão e análise de conteúdo, verificou-se que as principais motivações são o conforto e comodidade em usar um sanitário, a proteção que ele oferece contra animais perigosos ou durante a chuva. Constatou-se também que a privacidade é uma motivação forte e autêntica trazida pelas mulheres, e que vai ao encontro dos Objetivos de Desenvolvimento Sustentável. Esses resultados contribuem para programas de saneamento regionalizados,

que devem considerar a opinião dos beneficiários na implementação de tecnologias sociais de tratamento de esgoto.

Palavras-chave: saneamento; pesquisa qualitativa; várzea; áreas alagadas; ODS 6.

1. Introduction

In 2015, the United Nations (UN) established, among others, Sustainable Development Goal 6 (SDG 6), to ensure availability and sustainable management of sanitation for all. SDG 6 sets targets to “achieve access to adequate and equitable sanitation and hygiene for all, and end open defecation, with particular attention to the needs of women and girls and those in vulnerable situations” (United Nations General Assembly, 2015, p. 18).

The UN reported that 2.3 billion people do not have access to basic hand washing facilities, that 616 million people use precarious toilet facilities and that 494 million people still practice open defecation, 92% of them in rural areas (UN-Water, 2021). The WHO pints out non-investment to fight against open defecation as one of the causes for the failure of the public policies devised to this end (World Health Organization, 2019). Other factors that also contribute to failure are the families' lack of financial resources, the inaccessible price of toilets (Hernandez *et al.*, 2009; Gross & Günther, 2014), the preference of families to continue practicing open defecation (Thys *et al.*, 2015; Aiemjoy *et al.*, 2017), perceptions about the functionality, real and perceived cost, and durability of toilets (Jenkins & Curtis, 2005), and environmental limitations such as natural floods or those caused by catastrophes (Borges Pedro *et al.*, 2020).

In 2019, most of the countries with open defecation rates above 2% stated that they are

developing sanitation policies and plans to fight against this practice in their territories. However, to attain their own targets in combating this practice, they need to advance at a higher speed than the fastest progression rates already measured by the WHO (World Health Organization, 2019). These data are alarming because they reflect that, despite the efforts undertaken, there is still much to be done.

In the Brazilian North region, where most of the Amazon area is located, the situation is similar to the previous reports. Official data from the government show that, in 2010, 40% of the urban homes and only 9% of the rural ones had adequate sanitation infrastructure (Brazilian Institute of Geography and Statistics – Instituto Brasileiro de Geografia e Estatística, IBGE, 2011). The literature indicates that the motivations for the sustained use of toilets by rural populations are intrinsically related to regional specificities, such as the natural and cultural environment where the sanitation projects are being developed (Seymour & Hughes, 2014; Novotný; Hasman; Lepič, 2018). In the Brazilian Amazon, among the challenges that contribute to this statistic, are the floodplains from Central Amazon, which are huge land areas that, during almost five months of the year, are submerged due to the seasonal difference in water level, which can reach 12 meters in range throughout the year (Junk & Piedade, 2010). In order to overcome these challenges, it is necessary to consider technological solutions that are adequate to this environmental and social reality. As pointed out by Borges Pedro *et al.* (2020, p. 398),

Small-scale (decentralized or single-family) sanitation technologies can be considered the most suitable for rural environments with low population density because they are simpler, more accessible, easier to design and more likely to be socioculturally accepted. In addition to that, they are beneficial in places where there is lack of governmental commitment, enabling a reduction in the costs for related diseases.

It is essential to understand the motivations of the residents from the Amazon floodplain areas to plan actions related to sanitation. With this knowledge, it is possible to optimize the implementation of sanitation technologies and subsidize the elaboration of public policies, with high chances of acceptance and continued use by the residents of these areas. Thus, the need for studies is evident to understand how the environment and culture of riverside populations should be considered in promoting the use of toilets and contributing to the reduction of open defecation in the Brazilian North region.

Considering the scarcity of studies on the motivations among the riverine residents of the Médio Rio Solimões region to adopt and use toilets continuously, the proposals of this article are as follows:

- 1) To explore the motivating factors that influence on adoption and continuous use of toilets among riverine populations;
- 2) To evaluate elements that might exert an influence on these residents' perceptions; and
- 3) To contribute with diverse regionalized information for public policies and to achieve SDG 6.

2. Methodology

2.1. Data collection

Carried out in the state of Amazonas, this research was conducted with three groups of informants, each one with specific methodological approaches and at different times, with the same central objective of understanding the motivations of riverside dwellers regarding adoption and use of toilets (Table 1).

The first group, or **Group A**, is comprised by 12 rural communities (as defined by Moura et al. [2016]) distributed in the following Conservation Units (CUs): Mamirauá and Amanã Sustainable Development Reserves. Both are internationally renowned and are considered Humanity Heritage and RAMSAR Wetlands of International Importance (UNESCO, 2023). The rural communities researched are the following: Vila Alencar, Nova Colômbia, São Raimundo do Jarauá, Porto Braga, Barroso Maguari and Jubará (in the Mamirauá SDR); and Boa Esperança, Bom Jesus do Baré, São Paulo do Coraci, São João do Ipecaçu and Vila Nova do Putiri (in the Amanã SDR).

For this group, the main tool to obtain information was the Focus Group Discussion (FGD), according to methods defined by Lachapelle & Mastel (2017), and observing guidelines and procedures suggested by Trad (2009), such as a comfortable environment, use of recorders and small number of participants. The main guiding questions were as follows:

- a) Which are the motivating factors for the families to adopt and use toilets?

b) Which are the positive and negative aspects of toilets?

The 61 informants that made up the FGDs were, obligatorily, residents contemplated with the installation of toilets by the Mamirauá Institute for Sustainable Development in their homes and/or rural communities. Eventually, the heads and health agents also took part in the procedures, according to their availability at the meeting time. Altogether, the research team spent more than 40 hours in ship trips to arrive at the communities, starting with the city of Tefé-AM. The FGD meetings took place at the end of 2014 and beginning of 2015 and were conducted by researchers from the Environmental Engineering and Sociology areas.

The second group of informants (**Group B**) were residents gathered during the main community event of the CUs, the General Assemblies of the Mamirauá and Amanã Sustainable Development Reserves, in 2018. A total of 64 individual interviews were conducted (in homes with and without toilets). The interview script contained open questions about toilet use, the users' perceptions, preferences, motivations to adopt toilets and respective sanitation technologies. The data collection procedures were performed by research team members.

The third group (**Group C**) consisted in residents from the Santa Maria community, located in Tará Island, Médio Rio Solimões region, and close to the city of Tefé-AM. This group of informants was selected because they live in the community that was locus to the most recent experiments with sewage treatment adapted for floodplains (comprising 18% of the homes in the area).

The main questions addressed were similar to those from Group B and were always asked to

the couple (husband and wife) of the families, as requested by the residents themselves. A total of 24 semi-structured interviews were conducted in Group C, totaling 48 informants. The interviews lasted a mean of 40 minutes.

In all the groups, the informants' testimonies were recorded with their consent and participation was voluntary by signing the Free and Informed Consent Form.

Figure 1 shows the rural communities participating in this study.

2.2. Data analysis

The transcriptions corresponding to the interviews and focus groups were analyzed resorting to the method proposed by Bardin (2004), called "Content Analysis". The transcription of this material was carried out with total preservation of the testimonies without any linguistic correction, with the intention of not compromising quality of the information, as recommended by Queiroz (1991). Based on Câmara (2013), the content analysis was synthesized in three phases: the first one consists in the Pre-analysis, in which organization and floating reading of the transcripts of all testimonies were carried out, thus building the research corpus. In the second phase, Exploration of the material, the transcriptions were coded, categorized and classified, with a focus on the main objective of the paper. The third phase corresponded to Treatment of the results, with inferences and interpretation of the testimonies. A similar procedure in the sanitation area was conducted by Barnes et al. (2014).

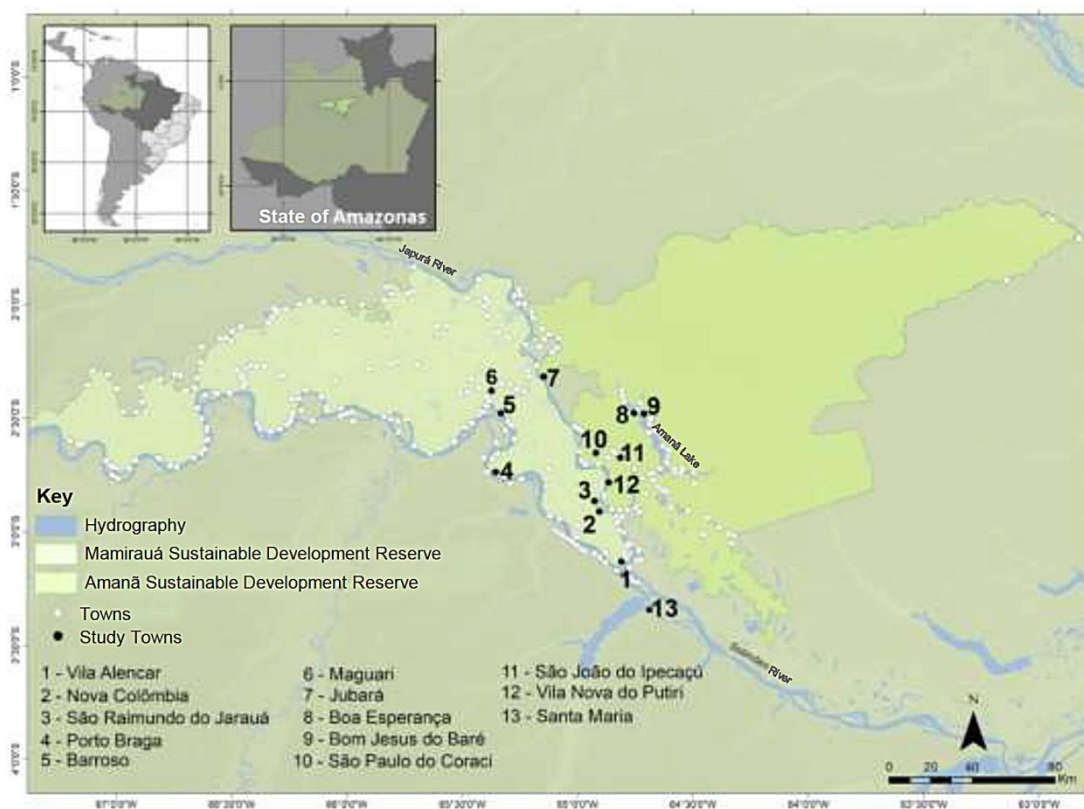


FIGURE 1 – Rural communities participating in this study. The numbered points are the communities, whereas the areas highlighted in light and dark green are the Mamirauá and Amaná Sustainable Development Reserves, respectively. The study area is part of the state of Amazonas.
SOURCE: SIG-Mamirauá Institute.

TABLE 1 – General characteristics of the groups interviewed.

Group of interviewees	Origin/Locus	No. of interviewees	Year when the interviews were conducted	Method
Group A	Mamirauá SDR¹: Vila Alencar, Nova Colômbia, São Raimundo do Jarauá, Porto Braga, Barroso, Maguari, Jubará Amaná SDR: Boa Esperança, Bom Jesus do Baré, São Paulo do Coraci, São João do Ipecaçu, Vila Nova do Putiri	61	2014-2015	Focus Group Discussion ²
Group B	General Assembly of the Mamirauá and Amaná SDRs	64	2018	Semi-structured interviews ³
Group C	Santa Maria, Tefé-AM, Rio Solimões	48	2019	

KEY: ¹ SDR: Sustainable Development Reserve; ² (Lachapelle & Mastel, 2017); ³ (Duarte, 2004; Manzini, 2004).

SOURCE: prepared by the authors.

The entire process for organizing and analyzing the material was conducted in the Atlas TI software (Walter & Bach, 2015). In the Results section, the informants' testimonies were identified as "Anonymous", followed by an identification number generated by the software.

This project meets all ethical principles and was approved via Plataforma Brasil in March 2019 under Opinion Number 3,231,146.

3. Results and discussion

3.1. Motivations perceived by the residents

The analysis process of the transcriptions resulted in 611 quotes (excerpts from the testimonies) referring to the motivations to adopt or use toilets continuously. They were classified into 40 codes and subsequently grouped in 13 categories to represent the most encompassing motivations. The codes and categories adopted were based on a bibliographic survey conducted for this purpose. The result of the coding and categorization process are presented in Table 2, as well as the underlying theoretical framework.

The category with the highest occurrence was "Comfort and Convenience", accounting for 22% of all the instances in the interviewees' testimonies. It consists of different motivations, such as the convenience of having a toilet inside the house, not having to go into the woods (open defecation) or using the external toilet at night or during the flood period, or even possession of a toilet itself. The appreciation of comfort is exemplified in the following statement: *it's better than doing it out in the open, because in the bathroom any time of the night would be when you feel like it, already indoors with a potty...* (Anonymous 27:5).

This pattern had already been observed in other locations, such as the study that was carried out in Ethiopia, which showed that comfort and convenience together were indicated by 39% of the interviewees as a reason for building a toilet (Hernandez; Dejene; Faris, 2009). Jenkins & Curtis (2005) found similar results, where this motivation was among the main ones in the study conducted in rural Benim. Both studies showed that this psychosocial factor has core importance in the family decision to adopt and use toilets, surpassing other expected factors, such as health.

Another significant motivation was "Protection and Safety", representing 12% of all the quotes from the interviewees. There were testimonies related to concerns about the flood period, risk of drowning and protection against intense sunlight. However, the most quoted motivations from this category corresponded to protection against dangerous animals, necessary protection for breeding animals (pigs, chickens, ducks) and protection against the rain. The fear of finding dangerous animals such as snakes, caiman, venomous insects or even jaguars was frequently reported as an important situation. Toilets inside the house can avoid this risk, rendering their use safer. As it will be reported, the 'Privacy' motivation is directly related to safety, as the women report discomfort and fear of being outside.

In relation to animal breeding, toilets can act as a barrier between the feces disposed on the soil and the animals bred, avoiding their contamination. Protection against the rain was also quite mentioned because the soil is irregular in the communities and, during the rainy period, locomotion is impaired due to the formation of quagmires. In addition, open defecation (which is the most common practice in these areas) becomes an unpleasant process. The following testimonies illustrate these concerns:

TABLE 2 – Analysis codes and categories referring to the motivations to use and/or adopt toilets.

Codes	Category	Categorization theoretical framework
inside the house (42) ; convenience of not going into the woods (26); convenience of using the toilet at night (25); convenience (16); own toilet (14); distance from the house (5); convenience during floods (3); outside the house (3); squatting position (2)	Comfort and Convenience (136): 22%	(O'Loughlin et al., 2006; Roma et al., 2010; Hirai et al., 2018)
protection against animals (27) ; protection of breeding animals (19); protection against the rain (18); protection against the sun (4); protection (2); safety (2); safety during a flood – risk of drowning (1)	Protection and Safety (73): 12%	(Jenkins & Curtis, 2005; Sommer et al., 2015)
concern about the children (62) ; concern about the family (5)	Caring for the Family (67): 11%	(Jenkins & Curtis, 2005; Bongartz; Vernon; Fox, 2016)
feeling of organization (31) ; hygiene (22); better living conditions (8); acting correctly (2); collective toilet (1)	Organization and Hygiene (64): 11%	(Hernandez; Dejene; Faris, 2009)
having a toilet/sink/shower (50) ; having a cesspool (7); robust and resistant technology (4)	Ideal toilet model (61): 10%	(Seymour & Hughes, 2014; Sutherland et al., 2021)
health (47)	Health (47): 8%	(Hernandez; Dejene; Faris, 2009)
concern about visitors (23) ; model from the city (10); setting the example (6); previous experiences (5); sophistication (1)	Prestige (45): 7%	(Jenkins & Curtis, 2005; Fu, 2010)
external/institutional influence(31)	Institutional influence (31): 5%	---
undefined model (25) ; important but not a priority (1)	Undefined motivation (26): 4%	---
not having a foul odor (21)	Odor (21): 3%	(Rheinländer et al., 2013; Bongartz; Vernon; Fox, 2016)
privacy (15)	Privacy (15): 3%	(Muanda; Goldin; Haldenwang, 2020)
not polluting the environment (12) ; not contaminating the water (3)	Environment (15): 2%	(Roma et al., 2010)
cleanliness (10)	Cleanliness (10): 2%	(O'Loughlin et al., 2006; Biran et al., 2011; Sutherland et al., 2021)

NOTES: a) The number of quotes in which the code appeared in the analysis is between parenthesis; b) The most significant codes from the category are in bold type; and c) The percentages are related to the total quotes.

SOURCE: prepared by the authors.

*Mainly like this, the first thing is that you don't run the risk of going into the woods at night and, suddenly, a **snake** or **something** else appears, something that could **harm** you, right? and there's another issue that's up to you even **protect the animals we breed**, for example **ducks, chickens** and it's even prevention for children (Anonymous 57:2).*

*...the importance is because we, the children... my child used to go there and get all **sticky with mud when it rained**, now all you have to do is go inside the room, she does her 'precision' right there and then she leaves there clean. It's very good (Anonymous 56:5).*

The concerns about dangerous animals in the Amazon was identified by Gomes et al. (2015), and is recurrent in the literature; the most frequently mentioned are snakes or insects that are found in open defecation sites (Routray et al., 2015). It is to be expected that in rural environments the occurrence of animals is part of the residents' everyday life, especially in more forested areas such as in Amazon, which explains the motivation to protect themselves from these risks.

Less significant categories in terms of number of quotes, but which represent little explored or even unknown motivations, were as follows: 'Caring for the Family', mainly *concern about the children*, relating their protection and health, but also to prevent them from being responsible for spreading feces in the local environment; 'Organization and Hygiene', through the *feeling of organization and hygiene* codes, in the sense of an organized community and residential family environment, also outlining a suitable place to do their physiological needs.

The motivations presented so far make up 56% of the entire analysis, showing that, although the residents interviewed are from different communities, there are common motivations among them that go

beyond the health issue, as is frequently explored. This finding corroborates other studies of this genre (Pearson & Mcphedran, 2008).

The "Health" category (8% of the total) was considered as an analysis unit due to its recurrent appreciation as a motivating factor in the literature (Pearson & Mcphedran, 2008). Concerns about diseases, worms, diarrhea, "chilblains" or "itching" were constant in the analysis of the interviews. Health was rarely indicated as an exclusive motivation. It appeared associated with other motivations, such as concern about the children from the community and hygiene in the community environment, with the practicality of not going into the woods and protection against animals. It was perceived that, in general, the residents interviewed had certain notion about the cause of the diseases and can associate sanitation with health: *it's because it prevents **diseases**, mainly diseases like **chilblains, diarrhea, mycosis** that affect **children's** feet... not us adults, but children step there in that situation, it affects* (Anonymous 25:10).

The "Odor" category emerged after its frequent occurrence in the interviewees' testimonies, and sometimes as an exclusive motivating factor. Terms such as "smell", "stink", "catinga", "breath" and "pixé" appeared to denote that the unpleasant odor of open-air feces or rudimentary toilets without maintenance is an important motivator to adopt toilets with better conditions. "Odor" is also associated with comfort, as a 'well-sealed' toilet would not emit unpleasant smells. The following statement illustrates this feeling: *to **improve people's** lives, I mean... that **bad smell** it throws, right? and we have a really nice one, and **it doesn't bother** us anymore* (Anonymous 80:6).

This motivation is recurrent in other studies about the topic. In the Philippines, absence of odors was ranked as the first and foremost reason for being satisfied with toilets (Cairncross, 2004). Rosenquist (2005) asserts that these people avoid toilets with bad smell due to the discomfort inherent to the situation. In a complementary way, Rheinländer et al. (2013) show that the odor perception by the residents has been neglected and that it is for this reason that several rural sanitation programs have failed. Therefore, the importance of the absence of odors as a legitimate motivation of the riverine residents becomes clear.

3.2. Multiple motivations

It was observed that each interviewee's motivations were not unique, as they occurred simultaneously and inter-related (co-occurrence). Figure 2 illustrates the connections between the most significant motivations.

The co-occurrence of the “Concern about the children” + “Health” motivations was found 14 times, the highest in the entire analysis. The second most frequent pair was “Use it at night” + “Protection against animals”, with 11 times. Analyzing the motivations individually and how each one of them co-occurs with others, “concern about the children” is the most frequent, accounting for 53% of the co-occurrences in relation to the other motivations. Therefore, it was verified that concern about the children is the interviewees' focus of attention and an important motivating factor to adopt and use toilets continuously.

The co-occurrence of motivations shows the existence of complementarity of reasons for using or adopting toilets, such as a flow of meanings and a chain of ideas. The convenience of not going into the woods (*pau-da-gata*), especially at night, but using a comfortable bathroom inside the house, with a toilet, prevents adults and children from exposing themselves to the risk of encountering potentially dangerous animals. It is believed that

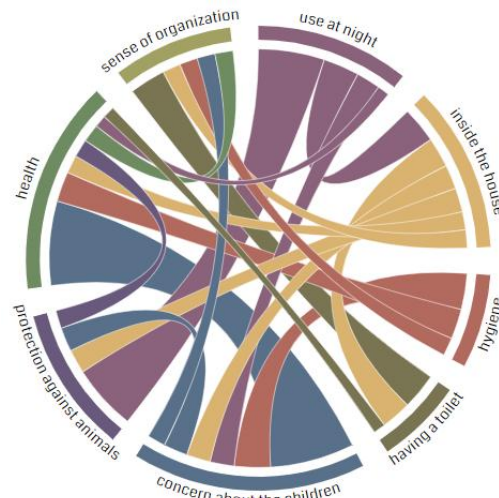


FIGURE 2 – Connection network corresponding to the co-occurrent motivations to use/adopt toilets among rural riverine residents.
SOURCE: prepared by the authors in the app.flourish.studio platform.

family health is preserved with a toilet inside or attached to the house.

The motivations found in a testimony are highlighted to illustrate this co-occurrence network:

*...it's good, you know, because many times we wake up at **night** to go to **the woods**, sometimes it's **raining**, we can't go out into the woods, you know? So having one at home makes it easier, right? better than putting yourself at risk of getting up and stepping on a **snake** or anything, a warm body getting cold, so it would be great to have it **inside the house**, you know? this is my opinion... it's really a **comfort** (Anonymous 69:3).*

3.3. Having a toilet as a perception differentiation element

In order to understand whether the motivations of the residents that have a toilet were different from those that did not, their testimonies were compared. It was possible to identify different perceptions between these two groups of informants (Figure 3).

For those that have a toilet, Privacy was the motivation that most stood out. Mainly indicated by the women, this motivation shows that open defecation is not the most desirable practice, as the absence of a closed, private and unexposed environment is a constant discomfort. This is an important trigger for sensitization of this group. Lack of privacy reported by women is constant in the scientific literature (Muanda; Goldin; Haldenwang, 2020), further evidencing its importance, as can be seen in the following statements: *we have no **privacy** in the open air; you know ...we need to have our*

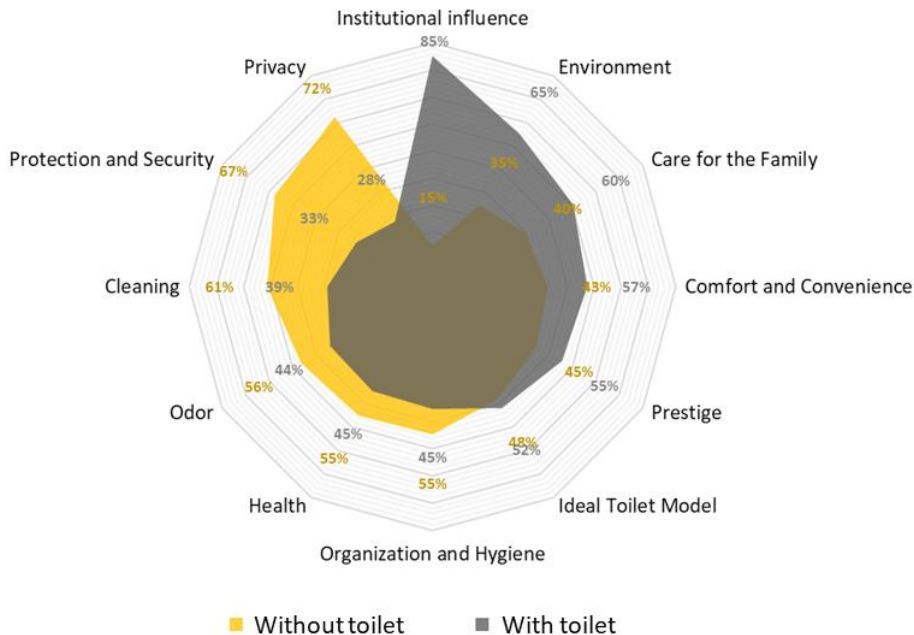


FIGURE 3 – Categories of motivations by groups that have toilets or not.
SOURCE: prepared by the authors.

privacy. *Even more here too, right now that **everything is crowded**, you know, there's nowhere to go. And if there's a toilet, we're protecting our **privacy** (Anonymous 70:2). And... that's why we wanted to... because of that, it was very difficult for you to go to the place, passing by like this, **people passing by, I was scared** (Anonymous 94:7).*

The desire for a safe space for the basic needs of these families, not to submit to the risks that the open environment imposes on them, such as snakes, insects, rain, jaguars, caimans and even “ghosts”, mainly at night, contributed for the Protection and Safety motivation to be the most influential for the group that did not have toilets.

The *Institutional influence* is quite higher for the group that has toilets. It is inferred that the families owning the toilet was strongly influenced by institutions that operate in the communities, such as Non-Governmental Organizations, churches, Municipal Health Departments through Community Health Agents (CHAs) and research institutions, among others. The influence can take place by means of equipment donations, installation of sanitation devices, or mobilization and sensitization activities. Hence the importance of the presence of different institutions in each community to address topics related to community organization and to health through sanitation.

Following the same line of thought, the Environment motivation was more expressive for those that have a toilet. It can be assumed that the families that already enjoy the benefits of a toilet overcame their fears with safety and privacy, starting to direct their attention to other problems caused by the lack of toilets, such as environmental contamination and related health problems. This awareness is directly influenced by the presence of institutions in the

community, with continuous workshops on family health and environmental education and, possibly, the influence of communication media, such as radio and TV. It also corroborates the assertion that when basic needs are met, the new demands go beyond a survival guarantee (Rosenquist, 2005), moving to another level of needs that involve individual and/or collective well-being.

Balanced between both groups, the *Ideal toilet model* motivation expresses appreciation for toilets that are robust, resistant to the weather and that have devices of interest, mainly those with flushing. Appreciation of adequate infrastructure is reported in the literature as a success factor for continuous toilet use (Alemu et al., 2017).

3.4. Motivations related to the ideal toilet

The “*Ideal toilet model*” category stood out as one of three main motivations mentioned by the Central Amazon residents. This category consists of three codes that emerged during the analysis. The first one, “*having a cesspool*”, appears as an opinion that the cesspool allows safe removal of excreta, preserving the community as an organized environment. The cesspool is seen as an ideal device, although without demonstrating technical knowledge of how this occurs.

Valuing the cesspool is accompanied by the second code, “*having a toilet/sink/shower*”, with the highest occurrence in the entire analysis. This motivation represents the opinion that the ideal toilet should have various elements capable of rendering its use more adequate or pleasant. The following testimony synthesizes this opinion:

*You need to have a **tank to flush**... something really well **organized**, if you want to have something well done, in that sense... the bathroom really **comfortable**, having a **tank to flush**, because having a bathroom to sit in the **toilet** and the person has to carry the water, what if the toilet dries up? The person does their needs and goes down to the riverside to get water? Right? Then it becomes much more difficult... now with a tank there, no... having the **tank** to be able to **flush**... and the child won't be able to get a bucket to throw there after their needs, right?, they don't have the strength to pick up a bucket to pour it there... and you need a lot of water to throw in so you don't have that smell... (Anonymous 73:3).*

The elements that appear in this category are almost always related to the toilet superstructure (“little house”), and not to the treatment of excreta, and include the existence of a wall, roof, window, sink for hand washing, and especially a toilet and piped water. These latter two were the most frequent in the analysis of the quotes. Gomes et al. (2015) also showed this interest among residents from the same region, ratifying that this characteristic is the preference of the riverine people from the area under study.

From the analysis of the interviews, it is noticed that the idea of the ideal toilet is related to the rural residents' life experiences when visiting the urban area. As they say, the “*model from the city*”, with a toilet and flush, is the best device.

Corroborating the findings of this article, a survey carried out in Burkina Faso with 593 residents showed that the users' preference depended not only on access to it but also on its attributes, with greater emphasis on toilets that used water (Seymour & Hughes, 2014). The desire to have a flush toilet is related to the feeling of organization and ease of use. In South Africa, the residents point

to this preference (flushing) in poor regions where dry toilets with urine diversion were previously installed, showing that the local users' perception should be considered when planning sanitation actions, mainly in awareness raising strategies (Mkhize et al., 2017).

The third analysis code (less frequent) was “*robust and resistant technology*”, showing interest in a resistant toilet for the floodplain area, capable of withstanding the region's environmental weather. Annually, the floodplain region from Central Amazon is flooded for a period of five months between rising and falling waters, and this dynamic directly interferes with the residents' way of life and with the community and home infrastructures (Alencar et al., 2014; Moura et al., 2016; Nascimento et al., 2019).

4. Final considerations

In synthesis, various motivations were found that can be explored while implementing and building toilets in riverside communities from the floodplain area. Safety, privacy, comfort and protection were the ones that most stood out.

It was shown that the riverine residents' perceptions change after the institutions that implemented the toilet models and educational actions purchased the toilets and monitored the process. Their concerns ceased to be linked to survival based on safety and protection and started to be related to factors associated with social coexistence, such as organization, hygiene and environment.

Safety and privacy are inter-related motivations, with special attention for the women's demands. Installation of a toilet inside the house

favors women and girls to enjoy well-being and comfort in their personal hygiene.

It is evidenced that the ideal toilet model desired by the riverside people is directly linked to their experiences outside their communities, considering that this desired toilet model is the same one found in the city, which has very different characteristics from those in the Amazonian floodplain communities. It is recommended to conduct studies aiming at the development of a solid technology that resists the floodplain environment.

In addition, for the purposes of successful planning and implementation of toilets in the floodplain areas from the Amazon, it is recommended that the approach be taken primarily using motivations such as protection, safety, caring for the family, organization and hygiene. Special attention should be paid to women's comfort and privacy and to children's protection and safety.

It is also important to highlight the importance of institutions in these territories in strengthening the search for the basic rights of having toilets with sewage treatment, as well as more investments by the public sector so that the target agreed upon in SDG 6 can be achieved in the Brazilian Amazon. This study collaborates to devising public policies, mainly in rural areas, so that access to adequate sanitation and hygiene is effectively achieved for all by 2030, relative to target 6.2 from SDG 6, reducing contamination risks in the environment and contributing to equitable sanitation.

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