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Becoming 'Swiss': waste management integration among Ethiopian and Eritrean migrants in Zürich, Switzerland

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For Swiss cities, connecting new migrants to basic services, like waste management, has emerged as an essential challenge toward their social and civic integration. Drawing on an ethnographic approach, this study investigates solid waste management integration within Zürich's Ethiopian and Eritrean migrant communities. Our findings suggest that new arrivals learn quickly and are driven by a motivation to integrate and adapt to expected norms. However, learning is often characterized by trial and error and accompanied by expensive mistakes. Barriers include a lack of translated informational material and insufficient opportunity for asylum seekers to learn rules and norms on waste management. We recommend making standardized materials available and ensuring clear communication in a language that newly arriving migrants can understand. We also recommend targeted training on life skills, including waste management behaviors for asylum seekers at residential processing centers so that refugees can be trained on expected norms before transitioning into an independent living situation.

KEYWORDS

migration, integration, Europe, solid waste management, refugee

1 Introduction

Over the past decade, European nations have grappled with unparalleled levels of migration from African countries. Migrating to escape violence or climate change, to seek better economic prospects, to study, or to join family already abroad, thousands cross, legally and illegally, into Europe each year. Although Africans represent a small percentage of global migrants, and the majority of African migrants migrate within the continent- not to Europe, the numbers traveling to Europe have been on the rise over the past decade and are expected to continue to increase in the future (Africa-Europe Foundation, 2021). Peoples from Ethiopia and Eritrea, in particular, have been a significant part of this movement, with almost a million Ethiopians alone migrating over the past 5 years (International Organization for Migration, 2021). In Switzerland, which, though it receives a fraction of the African migrants of its European neighbors France and Italy, more than 20% of the total population are foreign nationals, and although the vast majority (85%) are from within Europe, the proportion arriving from Africa, and Ethiopia and Eritrea in particular, is growing, with the vast majority of arrivals settling in urban areas (Federal Statistical Office, 2022a). As Swiss and other European cities grow as destinations for African migrants, connecting with these new arrivals and communicating with potentially hard-to-reach migrant communities in order to facilitate their access to basic services has emerged as a pressing challenge,

attracting the attention of both the public sector and academia (Demircioglu and Vivona, 2021; Concilio et al., 2022a; Zardo et al., 2023). How cities respond and succeed or fail to incorporate migrants into municipal systems, has important ramifications for the social and civic integration of these new arrivals, as well as the overall quality of life for migrants settling into their new homes. One of the main challenges that these migrants face in the city of Zurich city is abiding by new rules and regulations for solid waste management.

As authors, we want to emphasize that human beings are more than one identity. As Amnesty International (2023) has articulated, "migrant," "refugee" and "asylum-seeker" are only temporary terms, and do not reflect the whole identity of the individuals who have left their homes behind to start a new life in a new country. Although we use these labels out of convenience, it is important to remember that out of the many ways in which people describe themselves, these terms only refer to one experience, and that the identities of individuals are made up of many more components and experiences (Amnesty International, 2023). The terms "refugee," "asylum seeker" and "migrant" are often used interchangeably in order to describe people who have left their countries for another. According to Amnesty International (2023) a refugee is a person who has fled their own country because they are at risk of serious human rights violations and persecution there. As they note, a refugee feels that the threat to their safety and life were so great that they felt they had no choice but to leave and seek safety outside their country. Refugees have a right to international protection under the United Nations Convention of 1951, relating to the Status of Refugees, of which Switzerland, as a member (and home) of the United Nations High Commission for Refugees, is a party. As of 2021, Switzerland was home to more than 130,000 refugees (UNHCR, 2022). An asylum seeker is a person who has left their country and is seeking protection from persecution and serious human rights violations in another country, but who has not yet been accorded the legal status of 'refugee'. Switzerland receives more than 10,000 new asylum applications per year, with the number of new applications in 2021 reaching almost 15,000 (UNHCR, 2022). Although there is no internationally accepted definition for migrant, it is commonly considered that migrants are people staying outside their country of origin, who are not asylum seekers or refugees (Amnesty International, 2023). Many migrants leave their countries by choice, to pursue work or study opportunities, or to reunite with family. However, it is important to note that many migrants leave because they feel they must: because of poverty, violence, climate change, or other serious issues in their countries of origin. Moreover, many migrants or asylum seekers do not meet the legal definition of a refugee, but may, nonetheless, be in danger when they return home (Amnesty International, 2023). This challenge underscores the importance of upholding the essential human rights and protections of all refugees, asylum seekers, and migrants, and the necessity of protecting them from a forced return to their countries of origin without due cause.

Zürich, Switzerland's largest and most cosmopolitan city,[1] has a complex, and from the surface, bewilderingly confusing, solid waste management system. Residents are responsible for separating out recyclables, by either placing them in neighborhood bins, or placing them on the street according to a monthly schedule.[2] Non-recyclables can only be disposed of in a Zürich-Sack, a city-issued garbage bag that is available only at select stores, and which can only be disposed of in specific bins. Moreover, compliance is tightly monitored and enforced by the city, with steep fines regularly issued for improper disposal, littering, or mixing waste. More intangibly though, diligent waste management, both at home and in public, are considered to be a specifically 'Swiss' quality, and part of the national identity, so there is also intense social pressure to comply with what are perceived local norms and best practices. Yet, despite Zürich's cosmopolitan nature, and the complexity of processes residents are meant to adopt, waste management practices, including information on collection days and neighborhood or building specific disposal etiquette, are communicated through predominantly print literature, and almost exclusively in German. As a result, new residents, especially those who do not speak German, are illiterate, or are unfamiliar with the waste management norms of a European city grapple with the practices and systems they are meant to immediately learn and adopt. In such a context, how do migrants understand the waste management systems before them, and as African migration to European cities increases, how can integration, at least into municipal waste systems, be facilitated?

The purpose of this study is to qualitatively investigate the solid waste management experiences of Zürich's migrant communities, through the constructed and shared reality of newly arrived Ethiopian and Eritrean peoples. Moreover, by centring the voices of affected peoples, we seek to deepen conversations on municipal waste management in European cities both horizontally and vertically, and confront a service delivery challenge that has more often been discussed from a top-down, technocratic perspective (Tilley and Kalina, 2021). The study speaks directly to a gap within academic literature on migrants and access to public services, and waste management services in particular, in European cities. That is not to say that waste and wasting relationships have not received attention within a European context. On the contrary, both household relationships with waste and individual recycling behaviors have received ample discussion (e.g., Basili et al., 2006; Best, 2009; Fiorillo, 2013; Minelgaitė and Liobikienė, 2019a,b), even accounting for urbanization and rural–urban migration (Wilson and Velis, 2014). Yet, in regard to migrants, our understandings are much more fragmented. For instance, Demircioglu and Vivona (2021) have discussed how the state, through public services and organizations contribute to successful integration, while the importance of extending basic public services to migrants has been broadly acknowledged (Spencer, 2018), as well as the consequences of service provision gaps, especially within the context of the Covid-19 pandemic (Zardo et al., 2023). In regards to challenges, language, and its role as a barrier for migrants accessing services has been explored, including co-created digital solutions and platforms for linking migrants to their municipalities (Nteliou et al., 2021; Concilio et al., 2022; Karimi et al., 2022). Yet, so far, migrant experiences and understandings of waste and waste management

1 Of Zürich's nearly 1million residents, more than 30% are non-citizens. Geneva has a larger proportion of foreign residents (almost 50%), but Zürich has twice the population of Geneva, so a larger number of foreigners in total (Federal Statistical Office, 2022b).

2 For instance, different colors of glass and metal commonly have their own bins, while cardboard would be collected kerbside, by schedule. PET on the other hand, must be returned to a supermarket.

services have not captured scholarly attention despite waste's centrality to European urban life. This is the discussion we hope to start. We hope that this study will contribute to the increasing calls to decolonize research by reversing the accepted paradigm that European researchers can study African problems, but Africans do not have valuable perspectives on Europe's own challenges.

2 Methodological approach

2.1 Research design

This study aims to explore the waste management challenges faced by migrant communities during the process of integration. Migrant communities face various challenges, particularly in terms of transforming their identities. Understanding this community requires specific strategies and a trust-building approach. Understanding the issues and challenges faced by migrant populations requires the establishment of trustworthy relationships. This was accomplished by inviting a scholar from the migrant communities who possesses knowledge about their culture and local contexts pertaining to the subject matter. This scholar can easily establish stronger relationships, which in turn aids in comprehending the underlying problems and developing a more effective strategy to address the issue sustainably in both countries. Moreover, we employed a semi-ethnographic qualitative study design that combines traditional ethnographic methods with other qualitative approaches. This approach allowed us to gather comprehensive insights into the particular cultural and social context that this community went through and developed. By spending an extended amount of time with the participants during their religious activities, we were able to gain an insider's perspective and establish rapport with them. This enabled us to conduct in-depth interviews and collect personal narratives and detailed accounts of their experiences.

2.2 Study participants

For this investigation we interviewed new Ethiopian and Eritrean arrivals to Zürich. Newly arriving migrants were considered for the investigation to take advantage of the fresh memory of the challenges and their experiences and avoid recall bias, although all migrants could have passed through it. However, for the purposes of this article, and in Switzerland more broadly, there is a distinction between migrants, and asylum seekers and refugees. Migrants travel to Switzerland for work, study, or to join family. They arrived through a formal immigration process, went straight into an independent living situation (or with family), and are generally more resourced than arriving asylum seekers (though not necessarily). Switzerland does not receive the number of asylum seekers that its neighbors do, as peoples pursuing refugee status are legally obligated to apply at their first port of entry into Europe. Switzerland, being landlocked and surrounded by the Schengen Area,[3] is rarely the first point of entry for asylum seekers. However, asylum seekers will often travel to Switzerland to make their applications, or to apply for a second time after being denied refugee status at their first port of entry. On arrival to Switzerland, asylum seekers receive a class 'N' residency permit (Asylum seeker) and are taken to a processing center where they apply for refugee status. Asylum seekers remain in residence at the processing center while awaiting the outcome of their application, a process that can take up to a year. Successful applicants are granted refugee status and receive a 'B' permit (Resident), on which they can work and reside in any Canton. Some of those who are declined legal refugee status, but are allowed to remain in Switzerland, receive an 'F' permit (Provisionally admitted persons). These individuals are permitted to remain for an undefined period but are always at risk of deportation. Moreover, they are allowed to leave the processing center and find independent housing, but they may not change their Canton of residence. After 5 years an asylum seeker on an 'F' permit can apply for a 'B' permit, moving them toward a 'C' permit, which is legal, permanent residence. Although both migrants and asylum seekers are new to Switzerland, the distinction between the two groups is important for the purposes of this study, as their residency status can significantly impact their initial integration into Swiss daily life, as well as the security of their tenure within the country. Migrants arriving on visas go straight into independent living situations but are often able to draw on the expertise of family, colleagues, or classmates in order to settle into the rhythms of their new home. Asylum seekers, however, must live at the processing center, and only experience independent living once they have been granted (or denied) refugee status. The majority of asylum seekers arrive alone, lacking the support of family or friends, and describe constant anxiety over the fragility of their precarious legal status and the omnipresent fear of being deported.

2.3 Data collection and management

Accessing vulnerable communities, such as migrants and refugees, who are rightly wary of authority or the state, necessitated an embedded, ethnographic research approach, with substantial periods of immersion and trust building prior to data collection. Our investigation, led by an Ethiopian scholar, occurred over a two-month period in 2022 within the scattered Ethiopian and Eritrean community in Zürich. Finding respondents, and building trust within the community prior to data collection, was the most significant challenge encountered during this investigation. At the study's conception, we had intended to locate and interview participants at Zürich's Ethiopian and Eritrean restaurants, located predominantly in Oerlikon and Wiedikon, neighborhoods which host large immigrant communities, including Ethiopian and Eritrean people. However, after several weeks of engagement and introductions within these settings this approach proved to be a dead end, and an unsatisfactory place to build the trust necessary for an interview. Repositioning, we shifted to a more ethnographic approach. Ethnographic methods center the cultural setting, with the intent of producing a narrative account of a particular people within the context of their culture. Failing to source

3 The Schengen Area is composed of 27 European countries that have officially abolished all border controls between their mutual borders. Switzerland is not a member of the European Union, but is a member of the Schengen Area.

correspondents in a social context, we turned to community organizations, and organizational culture, which does not apply only to specific ethnic groups, but spans the breadth of the community. In this instance, the primary point of immersion came through faith-based organizations. Ethiopian and Eritrean people generally fall into three main religious categories: Orthodox Christian, Protestant, and Muslim. Through attending the various religious services, building trust with the congregations, and explaining the purpose of our research, we, after several weeks, began to receive invitations to private homes, and able to start seeking consent for interviews.

By centering our investigation on religious institutions, we also have been able to reach the remaining members of the community through their friends because of well-established trust. For Ethiopian and Eritrean people and other migrant communities, religious institutions are not only a place to pray, but essential social and cultural spaces (Watson, 2009; Eppsteiner and Hagan, 2016; Hashemi et al., 2020). This is particularly true outside of Ethiopia and Eritrea, where religious institutions become important cultural touchstones for Ethiopian and Eritrean migrants, and essential networking and community spaces for both new arrivals and established migrants alike. Furthermore, these religious organizations have structural hierarchies and leaders acting at different levels of community influence. This hierarchy facilitated immersion, as once important trust building occurred with church leadership, church leaders smoothed integration into the broader community, and assisted in introductions to relevant members of the congregation. Finally, integration was facilitated the positionality of the lead researcher, who is Ethiopian, speaks Amharic and Afaan Oromoo, and, as a professor in Ethiopia, carries status and social capital which was respected within the Zürich Ethiopian and Eritrean community. Moreover, we believe respondents were inspired by the importance of the investigation, which was painstakingly explained during the trust-building and consent-seeking process, as well as the novelty of an African scholar conducting fieldwork within a European context.

As noted, this initial period of trust-building occurred over several weeks, during which the main researcher regularly attended the various denominations of local Ethiopian and Eritrean religious services and additional community events and gatherings. In the following weeks and months, the researcher began receiving invitations to private homes and further introductions to additional members of the community, including asylum seekers, in communal living at the processing centers, still waiting on their pending refugee status. In total, data collection consisted of 19, long-form, narrative interviews with 20 different, recently arrived Habesha migrants, refugees, and asylum seekers. Often occurring at private homes, over coffee, at dinner tables, or after church services, these interviews were loosely structured, allowing for respondents to raise topics important to them, and to facilitate the co-creation of knowledge between interviewer and interviewee. In addition, these interviews were supplemented with detailed field notes and discussions with ERZ and local experts on immigration. Qualification for inclusion into the interview protocol was that the individual had arrived to Switzerland within the past 10 years. Interviews were conducted in either Amharic or Afaan Oromoo, depending on the respondents' preference, audio recorded, and later translated into English. All respondents provided written informed consent, which they were free to withdraw at any-time. Moreover, no personal information was collected, and all responses were anonymous. Data was analyzed thematically in NVivo version 12. This study has received ethical approval from the ETH Zürich Ethics Commission, proposal EK 2022-N-91. For transparency and conceptual replication, all underlying data and data collection tools are available upon reasonable request.

3 Findings

3.1 Learning the system

Given the challenges that migrants face daily, and the complexity of Zürich's solid waste management processes, how do new arrivals integrate into local systems and learn expected waste behaviors? In general, new arrivals describe learning quickly, and adapting to the new norms expected of Zürich residents. However, although most adapt, many described the learning process as painful, with lots of trial and error, and several, often expensive, mistakes. For migrants arriving in Zürich to join family (most often a husband or father), learning occurs through family members, who are already integrated into the system. One respondent,[4] who joined her father, who was already working in Switzerland described this process:

> *Our father managed our waste and other activities, and we focused on our education. Initially, he was taking care of everything, but he showed us how and what we could do. After understanding how to do it, we started helping him.*

These migrants were able to slowly adapt to Zürich's SWM systems, as they were not immediately thrust into the role of managing their household's wastes. Furthermore, they were able to learn from an integrated family member who spoke their own language. Other resourced migrants, who traveled to Switzerland to pursue educational or work opportunities describe learning either from colleagues, or from German language courses, where waste management is taught as part of the curriculum, as one respondent[5] described, "the language itself is taught in connection with daily life activities. Waste management is part of the daily life activities that we learned in the language courses".

Refugees, however, have fewer opportunities to learn, particularly asylum-seekers who are still residing at the processing center. Within the center, asylum-seekers are not responsible for waste management, and deposit all waste fractions into one, mixed, bin, with staff managing the day-to-day routine of emptying bins and separating out recyclables. Moreover, in a living situation which several respondents described as 'like a prison', new arrivals are isolated from the norms practiced in Zürich, and because the limited formal instruction they receive within the center focuses on Swiss law and the legal peculiarities related to immigration, residents are predominantly focused on the weight of their pending asylum cases rather than on the realities of daily life within Switzerland. Once an asylum-seeker has been granted refugee status, however, they move to independent living situations, where they become responsible for managing their own waste. Within these new residences, most refugee respondents described learning about separation from the landlord or caretaker of their building, who also provides new residents with rules and

4 Migrant 7.

5 Migrant 5.

regulations regarding waste management, as well as the annual schedule from ERZ. However, these materials, as well as the advice provided by helpful landlords, is predominantly in German, which new refugees have not had an opportunity to learn yet.

Ultimately however, both migrants and refugees learn Zürich's waste management system through experience, observation, and trial and error, as the following quotes illustrate:

> *You learn from the day-to-day activities and people around you. You observe how people do and then copy it; there are many ways to learn. Then it will be part of your daily life.*[6]

> *We learned from life itself.… Most of the time, I spend my time with the local people due to the nature of my work. Frequent interaction with the locals allowed me to learn the language and the waste management procedures more quickly. When I worked with them on the waste, I also learned what and why wastes are segregated. I learned from the experiences. I see them segregating and follow them.*[7]

> *As you may know, we do not have waste management procedures and facilities in Ethiopia. We learned it here, and they know this. We used to collect all waste together and discard it, but we learned through time. We realized that waste should be segregated before disposal. We talked to people, and they advised us on how to do it.*[8]

Learning through observing and doing also applied to expected norms for disposing of waste within public space, where in Zürich littering is considered a strong taboo, and residents are in the habit of maintaining the cleanliness of public space.[9] These norms contrast strongly with those respondents were accustomed to in Ethiopia or Eritrea, where waste in public space is part of daily life, and littering is a common behavior. As a result, several respondents described littering when they first arrived in Zürich, either out of ignorance or force of habit, before observing how unusual the behavior is within Swiss cities and adapting their own behavior. One refugee[10] described this shift:

> *When I came here, I did not have the behavior of disposing of throwing coffee cups [in a bin]; I drank the coffee and left the cup there. However, I realized that people throw it away after using it, and I felt ashamed for my wrongdoing. However, through time I learned and started acting the same.*

Although most respondents described eventually conforming to these new expectations, integration for most did not occur without a number of, often very expensive, mistakes. These costs occurred as a result of new residents not knowing how/what to separate, and disposing all their waste within the, relatively expensive, Züri-Sack, being fined for disposing of recyclables, such as glass, within the Züri-Sack, or through fines for disposing of household waste in ERZ bins using bags other than the Züri-Sack. A few respondents also received steep fines for littering within public space, as one refugee (see text footnote 8, respectively) described:

> *When we were still living in the processing center.…my friend and I were drinking beer in a public place, and my friend threw away his empty cane on the street. The security camera caught him, and a 350 CHF fine came to him. Upon his denial, they proved him guilty with his picture, added 150 CHF, and fined him 500 CHF.*

3.2 Motivations for change

For new migrants, what motivations drive the behavior changes needed to integrate into Zürich's solid waste management system? Among both migrants and refugees, respondents overwhelmingly articulated a belief that adopting household waste management best practices, as advocated by ERZ, was an essential part of becoming 'Swiss' and integrating into society. Furthermore, nearly half of all respondents described waste management as part of the 'culture' in Switzerland, explaining that waste management was an integral part of daily life within Zürich. Moreover, many respondents contrasted what they perceived as a laxity toward waste management in Ethiopia or Eritrea, and described how new arrivals must 'unlearn' habits developed there, to integrate and become 'Swiss', as the following quotes describe:

> *The native people believe that as you need to eat, you must also give value to your waste and manage it. Most of the time, immigrants are reluctant to follow the rules and regulations due to the bad behavior they developed in childhood. We might not have the chance to learn and do it at that time due to a lack of systems and facilities. That behavior should not stay with us in a country where you have sufficient facilities with a well-organized management system (see text footnote 5, respectively).*

> *Waste management is a culture for the local communities, and it is part of their daily life activities. Our children are born and grow-up here and are more concerned than us. Immigrants come from different backgrounds and learn the system after they are accustomed to their previous system and experienced that behavior. Nevertheless, they have to learn and integrate into the new system, but the influences of the earlier experiences still exist.*[11]

In addition to believing that following household waste management best practices were an integral part of being 'Swiss', respondents also expressed the opinion that clean public spaces were a hallmark characteristic of Swiss urban life, with several contrasting the cleanliness of Zürich's parks and streets with Ethiopian cities, as

6 Refugee 1.

7 Refugee 4.

8 Migrant 8.

9 In Zürich garbage trucks are labeled with the slogan "Damit es in der Stadt so schön ist wie zuhause" ("so that the city is as clean as your house").

10 Refugee 8.

11 Refugee 9.

well as other European cities they had visited. This contrast was described by many as a driver toward personal behavior change toward waste within public space, as one refugee[12] described, "when you come to this country, its environment encourages you to keep it clean…. Waste bins are placed in various areas to deposit your waste. Unless you are stupid, you do not dispose of your waste and mess up the environment. The facilities' availability and the environment's cleanness help you learn fast." Furthermore, although knowledge of the value that ERZ derives from collected waste, through circular waste management and waste to energy facilities, was by no means widespread. A handful of respondents were able to explain that they had learned that trash has some value within Zürich's system, and it would be irresponsible for them to 'waste' it. This observation was often contrasted with respondents' experiences in Ethiopia or Eritrea, where sustainable waste management practices were described as not being prioritized, which, on reflection, respondents described as being of detriment to the economy and the local environment in those countries.

Finally, by far, the most common motivation driving a change in waste management behaviors among migrants, as described in the interviews, was a desire to obey the rules in their new home, and a fear of punishment for failing to do so. This fear was most pronounced among asylum-seekers and refugees, who were particularly concerned about the impacts that breaking the law could have on their immigration status and was enhanced by a perception of the Swiss state as all-knowing: aware of, and able to punish, even the slightest infraction of the rules. In part, this motivation formed a moral imperative among migrants to follow the rules and norms within Zürich, as they considered it an important part of integration, as well as the 'right' thing to do as guests in a new home. As one refugee (see text footnote 7, respectively) described, "As a newcomer… my job is to obey the law and do as it is regulated." Overwhelmingly, however, respondents, especially refugees and asylum-seekers, were afraid of the potential consequences of making a mistake, understandable given their vulnerable status within Switzerland. For most, this was represented by the costly, and sometimes overlapping fines issued by the city for infractions. More than half of the respondents were able to recount a past fine, occurred by themselves or a friend, often for a minor error, or for breaking a rule they were not aware of, as the following quotes show:

> *One day I made a mistake by including glass in general waste and depositing it into the bin. They found me guilty through my address which they found in the waste and fined me for it. I was new to the country and the system. It was my mistake. I did not complain; I accepted the penalty and paid 320 CHF. Since then, I have never repeated my mistake; I have learned from it (see text footnote 7, respectively).*

> *One day, I put bottles in a unique plastic bag and took them to the collection container. When I took the waste, people were transferring the waste to the vehicle. Immediately one of the persons already identified that I included bottles in the bag and took them for collection. He charmingly talked to me and asked my name without telling me I was doing wrong. I did not think that he was taking my information for punishment. After a few days, I received a penalty letter of about 350 CHF to address, indicating what I did. This condition taught me a lot about not repeating. What surprised me was that he did not refuse to collect or tell me to correct it; he wanted to teach me by penalty.*[13]

> *I have made some mistakes unintentionally…. I have never been punished as an individual, but we have been fined several times as building residents due to the inability of the officials to identify a family who committed the mistake. Sometimes people are reluctant to buy the Zürich plastic bags [Züri-Sack] and deposit their waste in inappropriate plastic bags, and then all the building residents are imposed mass punishment (see text footnote 6, respectively).*

This fear of being fined was compounded by a sense of the Swiss state as omnipotent, with respondents painting a picture of city filled with cameras, capable of capturing and reporting on the slightest infraction, as one refugee (see text footnote 12, respectively) described "you cannot think of discarding waste outside of its containers; otherwise, you face punishment because security cameras are everywhere to monitor all activities." Although the fear of consequences weighed heavy on the minds of respondents, they nonetheless, overwhelmingly, expressed a feeling that harsh enforcement of the rules was the most effective way of driving behavior change within their community. As one refugee (see text footnote 14, respectively) described, "education can correct you, but punishment is also essential to bring lasting behavioral change because of fear of the penalty." Unfortunately, for migrants, punishment is more accessible than education.

3.3 Barriers to integration

As our respondents have described, despite the complexity of Zürich's solid waste management systems, new arrivals do eventually adapt and learn over time. However, much of this learning process occurs through experience and trial and error. Integration into these systems occurs, but often through expensive mistakes by new arrivals, and although most respondents felt that these mechanisms were necessary to drive behavior change, is it necessary that they fall so harshly on a community that has not been given the opportunity to learn? What are the barriers to a more efficient and equitable integration, and what do migrants identify as key gaps within this system?

First, asylum-seekers and refugees highlighted the lack of sufficient opportunity for learning rules and best practices related to waste management *before* they are put into a residential situation and forced to learn through experience. While at the processing center, asylum-seekers described being isolated from the city and broader Swiss society, and although they are provided with information relevant to their asylum applications and their legal rights while in Switzerland, they are provided

12 Refugee 6.

13 Refugee 5.

with no education on Swiss culture or life. Furthermore, for refugees leaving the processing center, this isolation can continue, with respondents describing feeling outside of Swiss society and reliant on the relief they receive through refugee support services, and Ethiopian and Eritrean oriented cultural institutions, such as local Amharic or Afaan Oromoo language churches.

Second, in Zürich, most communication from the City, on waste management and any other rules or regulations, is primarily through printed materials distributed through the post. However, interviews suggest that this is an ineffective way to reach Ethiopian and Eritrean migrants because all printed materials are provided in German, which new arrivals have not yet learned. Alternative languages for communication do not exist, and although some respondents indicated that they spent time to translate important looking materials, such as residential building rules, etc., into Amharic or Afaan Oromoo, with the help of Google Translate, most respondents indicated that they ignore their mail, unless it specifically is addressed to them with their name on it. When pressed in interviews about what written communication they had received from the city regarding waste management, few could recall any, with the annual calendar for collections being the only item respondents were familiar with. Yet, as we described, the City of Zürich and ERZ *are* highly communicative, as most German speaking residents would be able to attest, indicating that Ethiopian and Eritrean migrants are missing a substantial amount of material which might facilitate their integration into the City's systems. Finally, language remains a barrier on the streets, with many respondents describing an inability to read German-language posted notices from the city, or to understand instructions written on waste bins. However, as a few individuals described, the common practice of including pictures on recycling bins, facilitated inclusion for non-German speakers. As one migrant[14] who could not yet speak German described, "[recyclables] are easily recognizable because the image of the materials is also indicated on the containers".

4 Conclusion and recommendations

In this study, we investigated the challenges the Ethiopian and Eritrean migrants faced in Zurich waste management during integration. Our findings suggest that new arrivals, at least the ones we were able to reach, want to adapt. Driven by a motivation to integrate and adapt to expected norms, as well as the ever-present fear of being punished for making a mistake, they learn quickly, and rapidly adopt daily norms regarding waste management. Yet, although most learn and adjust to these new expectations of 'Swiss' waste management, the learning process can be painful, with most respondents describing at least one fine or warning they had received for breaking rules related to disposal. This learning curve is particularly steep for refugees and asylum seekers, who often lack social connections within Zürich, and spend considerable time in communal living at a processing center, where they are not responsible for their own waste management, prior to moving to an independent living situation following the outcome of their application for refugee status. Moreover, this integration is aggravated by a language barrier, with all materials or instruction provided in German, a language few new arrivals are able to speak. Given these findings, what can ERZ do to smooth this integration process?

Our recommendations emerged from this analysis but were also directly voiced by our respondents. Although most respondents, despite being personally affected, still believed in enforcement and penalties as an effective way to drive behavior change. Nonetheless, enforcement must be accompanied by education, individuals should not be punished for breaking rules they are largely unaware of, and new arrivals must be afforded more opportunities to learn about Swiss and Zürich laws, as well as expected daily norms and responsibilities. This recommendation is particularly relevant for asylum seekers, who do not have the social connections to learn from friends or relatives, but have the time and structure for formal instruction during their stay in the processing centers. Incorporating training on relevant laws, expected norms, and local customs, including waste management best practices, is an important first step toward integrating these individuals into Swiss daily life. Secondly, this information must be presented in a language new arrivals can understand, and the City of Zurich must recognize that providing materials solely in German, in a city whose population is more than 30% foreign-born, will result in new arrivals deviating from best practices: hindering integration and frustrating efforts toward achieving circularity within waste systems. Integration material relevant to city life should be provided in a variety of common languages, including Amharic and Afaan Oromoo, while materials even just in English would be an important first step, as most Ethiopian migrants were, to some degree, fluent in that language as well. Translated materials should be distributed within the processing centers, as well as through important cultural and community organizations, which, as this investigation has suggested, should include religious institutions.

Finally, although this study centered on Zürich's Ethiopian and Eritrean communities, we believe these findings hold broad relevance for other migrant communities facing similar barriers to integration and to other European cities struggling to provide public services to growing migrant populations. Investigating other dynamics of human-waste relationships within vulnerable migrant communities, including how understandings of perceived best practices are formed and circulate-both within migrant communities and possibly back to migrants' countries of origin-remains a rich space for further investigation. Moreover, the work we do, adopting humane and equitable policies for instruction and communication in Zürich, has the potential to establish a standard for integration within Europe, which other cities can adopt and build upon.

Data availability statement

In order to protect the identity of our respondents we are not making the underlying data publically available. However, for purposes of transparency and conceptual replication anonymised transcripts and data collection tools are available upon reasonable request.

Ethics statement

The studies involving humans were approved by ETH Zürich Ethics Commission, proposal EK 2022-N-91. The studies were conducted in accordance with the local legislation and institutional

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requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

GT: Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. MK: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Writing – original draft. ET: Conceptualization, Funding acquisition, Project administration, Resources, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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