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Com-Passionate Composting: Excrement Management as Matter of Care

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Abstract

This article examines composting toilets as multispecies infrastructures composed of relations among excrement, microbes, worms, plants, water, air, people, things, and politics, and as matters of care. It inquires into how people reimagine naturecultural relations through composting their excrement, arguing that this practice can be understood as com-passionate care insofar as it involves feeling with others through doings, affections, and sensibilities. Drawing on autoethnographic and ethnographic fieldwork conducted between 2019 and 2026 in Chile, and complemented by fieldwork in France and Austria in 2024, the article discusses how people rework relationships to excrement amid persistent social inequalities that reinforce the disposability and denial ethos characterizing modern subjectivities and waste practices. It concludes that caring for and taking care of one's excrement involve profound affective and ethical transformations when not experienced as reinforcing social inequalities. The embodied experience of integration into metabolic cycles that this care entails remains fragile in the absence of political collectives capable of deciding which forms of care and technologies sustain collective flourishing for com-passionate presents and futures.

Keywords

care; composting toilets; human waste; infrastructural justice; more-than-human worlds

1. Introduction

I write these lines with soil under my fingernails. Moments ago, my family and I harvested this year's potatoes. As in previous years, the *pilme*—a typical insect in this area—forced us to harvest early at Christmas. Once again, we were unable to spread diluted urine over the leaves every morning. "That's what my mother used to do, and it worked," echoes the voice of one of my most trusted agricultural advisors. There are barely enough potatoes to last the winter and serve as seed for the next season. Now, sitting behind my computer,

I regret not having cared for them better; yet moments ago, while earthing them up, it was all joy and gratitude. The harvest was not bad considering that—for the first time—the soil was prepared using only compost made from our excrement. The soil beneath my fingernails came from our guts.

This article is about composting excrement, indeterminacy, and future horizons. "Composting toilets" (CTs) refer broadly to infrastructures that refrain from using water to transport excrement and process it so it returns to the earth as organic matter. I examine CTs as matters of care (Puig de la Bellacasa, 2017) and inquire into how people reimagine naturecultural relations through composting their excrement. The argument is that this practice can be understood as com-passionate care—as it involves feeling with more-than-human entities through doings, affections, and sensibilities—and commits to a renewed relation with excrement through everyday practices within affective interdependent care entanglements.

I write from the standpoint of a mother, migrant, and work-overloaded anthropologist in Chilean neoliberal academia who has designed, used, and cared for CTs for six years, and leads an ethnographic research project on non-conventional sanitation (2024–2027). I am deeply involved in the argument I advance. I learn about composting human excrement through my own experiences and others'. I am not commercially involved with CTs nor am I an activist—although I organize activities in the academia and beyond, and support others in developing CTs when asked, since I am convinced that changing how we manage human excrement is urgent.

Drawing on six years of autoethnographic and over two years of ethnographic research, I examine how people reimagine naturecultural relations through composting their excrement. I move from theoretical and methodological framing to empirical analyses of CTs as matters of care and as potentially convivial infrastructures for com-passionate presents and futures.

2. Theoretical Framing

2.1. Care and Human Waste

Self-care and caring for the environment have become central to neoliberal ideologies. Neoliberal appropriations of care reinforce the dualistic nature–culture divide and stress self-responsibility as an individual endeavor, thereby legitimizing extractive and exploitative economies. Reclaiming care as a critical concept can help unsettle these tendencies. In Latin America, this reappropriation spans from liberation theologian Boff's (1999) understanding of care for both humans and the planet as essential to life on Earth, to critical, indigenous, and community feminisms which—while questioning gender as a colonial legacy—ground life in collective care for the relations among everything that exists (Batthyány, 2020; Gabbert & Lang, 2019). The concept of conviviality, developed by Ivan Illich and collaborators in the 1970s, has also been recently revisited (Mecila, 2022). For Illich (1973), conviviality denotes an egalitarian being-with in shared action—"individual freedom realized in personal interdependence" (p. 11)—and depends on the creation of convivial tools that "give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision" (p. 21). This perspective situates care within political collectives capable of deciding which forms of care and technologies contribute to collective flourishing.

Puig de la Bellacasa (2017) notes that care has been central to social sciences as it is indispensable to life. Drawing on classic feminist work, she proposes "a triptych vision of care—doings/practice, affectivity, and

ethics–politics" (p. 60)—where care is inseparably practical labor, a vital affective state, and an ethical obligation. Care is a non-normative necessity and a non-moralistic obligation, inherent to interdependency relations, since "for life to even be, it needs to be fostered in some way" (Puig de la Bellacasa, 2017, p. 60). She proposes thinking with care through the concept of "matters of care," emphasizing the importance of exhibiting matters of care precisely where care appears absent or out of place. This is the case with waste, and specifically with excrement; caring for it is to engage through doings, affectivity, and ethics with neglected things and devalued doings. This framing is useful as it highlights how domination rationales are reproduced in everyday practices, while also opening possibilities for reclaiming relations to excrement as matters of care in more-than-human worlds. Thus, care is acknowledged as an organizing social life principle while advancing a vision of life centered on care and naturecultural interdependencies.

An understanding of waste as a matter of care has recently gained attention in waste studies. Lau (2023) suggests that it helps recognize affections and intimate knowledge involved in working and living with waste. Studying food waste practices in Hong Kong, Leung (2025) proposes a waste care continuum ranging from auditing care—characterized by technocratic governance and the marginalization of community waste practices—to embodied care, which refers to operational, embodied knowledge generated through direct engagement in community-based waste recovery initiatives. This framework offers a conceptual bridge between grassroots waste knowledge and formal policymaking, and foregrounds the interactions among different modalities of response-ability (Haraway, 2016). In this study, it helps illuminate the uneasy relations among global and local sanitation politics and self-sustained, situated infrastructures.

Despite their centrality to life, excrement and defecation have been largely avoided in academia, particularly in anthropology (van der Geest, 2007). In her explorations of the ethics of waste, Hawkins (2006) suggests that because relations to waste are dynamic, "the ethical and political question is, how might new waste practices emerge?" (p. 3). Relations to excrement were central to the emergence and maintenance of the ethos of disposability and denial characterizing modern subjectivities and practices. Waste mediates relations to our bodies through repeated practices, habits, and disciplines, as well as the thoughts and feelings that render these actions meaningful. In this way, waste orders relations between the self and the world through embodied sensibilities.

2.2. Flush Toilets as Expressions of Modernity

The now-dominant notion that excrement is a dangerous, inherently dirty waste product that needs to be flushed away as quickly as possible developed gradually. From the 16th century onward, shit became a semiotic element enabling contrasts between the countryside and the city, and between social and racial others (Laporte, 1980). State and colonial projects subsequently invested heavily in disciplining defecation and excrement management (Anderson, 2024). With the convergence of industrial capitalism and urbanization in Europe and North America in the late 19th century, water-based sanitation came to be seen as the most effective solution. This model was widely contested: The reuse of human excrement as fertilizer through composting had been a well-established practice, and early sewerage systems initially resulted in negative health and environmental effects (Koumparou et al., 2019). The sanitary revolution—often celebrated as a medical and technological achievement—was driven largely by social factors. As Inglis (2001) suggests, the flush toilet became "the *sine qua non* of a society that denies the existence of the human body's excreta-making capacities" (p. 243). In colonized and later "underdeveloped" countries, sewerage

infrastructures remained aspirational rather than factual (Borowy, 2021; Jewitt, 2011). Norms of private, enclosed defecation and rapid waste disposal spread across social groups and geographies, propelled by the desire to appear modern, civilized, and developed, while the capacity to enact these norms remained uneven. The management of bodily excretion operates as a site of class, gendered, and other forms of othering (Pickering & Wiseman, 2019).

2.3. CTs: Infrastructures Between Counterculture and Conviviality

Following Star (1999, pp. 380–383), infrastructures are formed through relations, embedded in broader structural arrangements, defined by their scope, shaped through situated learning and adaptation, and sustained by shared social conventions. I understand CTs as multispecies infrastructures composed of relations among excrement, microbes, worms, plants, water, air, people, things, and politics. In the 20th century, CTs were promoted as appropriate technologies for the poor (Morgan, 2007), eccentric countercultural artefacts (Hundertwasser, 2022), and even advanced technologies for nationwide living condition improvements in Mao's China (Leung, 2024). Today, CTs appear as viable sanitation options across diverse contexts. Classified as safely managed sanitation services, they are promoted as forms of circular, sustainable, or ecological sanitation by actors advancing distinct sociotechnical imaginaries and future horizons. Contemporary human excrement composting practices may draw on long-standing agricultural traditions (Leung, 2024) or on recent revaluations of precolonial practices (Bezerra et al., 2019).

In this research, CTs are predominantly non-commercial, DIY infrastructures that transport excrement without water, and can be considered innovative insofar as they bring "past doings into a context in which they become new" (Puig de la Bellacasa, 2017, p. 428). Other ethnographic studies of comparable CTs include Pickering's (2010) research with US "hippies" and "drop-outs" living in Hawai'i—where she explores embodiment as a site of generative action and social critique and conceives CTs as countercultural artifacts—and Vetter's (2023) analysis of CTs in German festivals and permaculture projects, considering them as convivial technologies defined by five dimensions: connectedness, accessibility, adaptability and repairability, responsible interaction with living beings and ecological cycles, and proportional use of energy, materials, and resources. The CTs examined here express these five dimensions and may constitute sites of generative action and social critique, while being built, repaired, and maintained in the search for viable domestic sanitation options in the context of social inequalities.

2.4. Composting and Com-Passion

Feminist science and technology studies, environmental humanities, and waste studies often present composting as an exemplary practice that opens alternative horizons. Earthworms, in particular, have become central beings in alternative worlding practices (Abrahamsson & Bertoni, 2014; Hawkins, 2006). For Haraway (2016), compost is an apt metaphor for our troubled times: "We are humus, not Homo; we are compost, not posthuman" (p. 55), she states repeatedly. For Puig de la Bellacasa (2017), practicing composting is an ethical doing through which naturecultural interdependency becomes a matter of care, an "obligation to care for an interdependent earthy other" (p. 194). Accordingly, "composting is our part of the collaborative and ongoing work" of co-creating soil (Puig de la Bellacasa, 2014, p. 35). This co-creative dimension, together with the affective involvement in composting, is what I highlight with the term com-passionate composting.

Etymologically connected to suffering, "passion" has come to mean strong feeling, affection, or emotion towards someone or something (Passion, n.d.). I understand compassion as "feeling with": com-passion. Gronemeyer (2015) notes that the preposition "com" (with) has increasingly come to describe sharp opposition in struggles over advantage, power, or influence, as reflected in dominant notions of competition, consent, consumption, and conformity. This observation warns against overly straightforward claims of togetherness and commoning in the study of composting. That said, I use com-passion to foreground the possibility of being-with in shared doing, akin to conviviality, implied in composting our excrement, while also highlighting the capacity to feel-with and be affected by nonhuman soil co-creators and other CT-related entities. My use of com-passionate stresses the affective, interdependent entanglements involved in these practices. It is a theoretical innovation in the same sense that CTs are innovative: new in this context, yet deeply connected to existing work on care and alternative social practices.

3. Methodological Framing: A Dirty Ethnography

This article draws on ethnographic materials produced between 2019 and 2026, including interviews, field notes, photographs, videos, and artistic productions. The research combines an autoethnographic phase centered on the implementation of CTs in my household (2019–2023), with an ethnography of non-conventional domestic sanitation (2024–2027). The materials produced during the first phase include my family's experience in CT design and use, as well as accounts by over 100 users from diverse sociocultural backgrounds, spanning ages 2 to 92, 10 nationalities, nine countries of residence, and differing levels of experience that range from first-time use to long-term CT caretaking.

In the ongoing multimodal ethnography, I work with a research assistant—first anthropologist José Saavedra and subsequently Felipe Cecchi—who had no prior experience with CTs, counterbalancing my long-standing involvement. I also work occasionally with my long-term audiovisual collaborator and partner, filmmaker Cristóbal García. The research is centered in the Los Lagos Region, Chile, spanning the mainland from Lake Llanquihue to the Pacific Ocean and including the Chiloé Archipelago. Fieldwork includes approximately 60 hours of walk-alongs, informal conversations, field notes on everyday sanitation practices, visits to wastewater treatment plants, and interviews with 15 public officials across water management, public health, environmental oversight, travel, and agricultural research; one entrepreneur in the alternative sanitation sector; and six non-conventional sanitation promoters in the construction, education, and travel fields. The topics include local sanitation conditions, perceived strengths and challenges, and potential future developments. Through walk-alongs and snowball sampling, we identified, visited, and documented the experiences of 20 households implementing CTs.

Complementarily, we conducted two weeks of intensive audiovisual research in France and Austria during July–August 2024 to address the topic's transnational dimension. On the one hand, the European CT scene is a key reference for Chilean counterparts: More than half of CTs in Chile were inspired by European experiences accessed online, through personal travel, or via third parties. On the other hand, CTs have been regulated by the European sanitation sector for much longer than in Chile. In France and Austria, CTs have become standard at festivals and public events, effectively replacing chemical toilets and becoming increasingly familiar to the general population, while they remain rare in Chile. In Occitanie, southern France, we documented one composting cooperative supplying toilets for events, three households, and a municipal collective garden; and in Vienna and surroundings, one company that supplies public and event toilets. This

material includes approximately 10 hours of interviews and nine hours of additional footage, covering an event, everyday domestic use and work, and conversations with occasional users. Commercial cases were selected out of convenience and interest, and contacted in advance by email; households and the municipal garden were contacted in the field.

All these methodological steps frame my approach and inform my arguments, focusing on people's experiences composting human excrement and reimagining naturecultural relations in two contexts: one marked by severely deficient conventional sanitation and limited recognition of alternatives in Chile, and another by generalized conventional sanitation alongside growing awareness of its ecological limits in France and Austria. Conversations and interviews were conducted in Spanish, English, French, and German; the English translations are mine. I use fictional names, as required by my university's ethics committee. Fieldwork materials were analyzed using constant comparison and situational analysis.

4. Excrement Management as a Matter of Care

In this section, I think about CTs as doings/practices, affectivity, and ethics–politics; introduce the key features of the CTs used in this study and their contexts; situate excrement management within a waste care continuum; and foreground transformations in naturecultural relations through com-passionate composting.

4.1. Situated CTs

A CT varies widely in terms of shape, operation, and maintenance. Table 1 summarizes the key characteristics of the CTs in the study.

Except for CT24—an autonomous commercial vermicomposting model installed by a municipality in a collective garden and maintained by the supplying company—all CTs are designed, implemented, used, and maintained by people I refer to as "caretakers," emphasizing their direct involvement in everyday care practices. A shared characteristic among them is that they have completed secondary education, and most have professional or university training; the most common backgrounds are agronomy (six), forestry (four), and the arts (four).

Design choices affect care practices. Whether urine is separated and the size and number of collection containers impact the frequency of container change (ranging from once a week to once every six months) and emptying (from once a month to once every one or two years). Differences in materials lead to considerable variations in use and labor. Design choices also result in marked sensory differences, including whether users see feces, feel their temperature, hear urine pouring onto a solid surface, and experience different odors depending on how fully the excrement is covered.

A shorter distance between the toilet seat and the container improves coverage and largely confines odors to the act of defecation. Connecting the container to the outside simplifies changing and emptying, but allows mice or other small animals to enter, requiring the caretakers' attention. When the container is not connected to the outside, such entries are avoided; however, it must be carried over longer distances and through the house.

Table 1. Characteristics of CTs in the study.

Code	Since	Location			No. of CTs	Only CT	Urine Diversion	Container Size	Compost Use	Regular Users			
		HH/NH	R/U/PU	Country						No.	Ages Adults	Ages Children	Gender
CT1	2023	HH	R	CL	1	yes	no	20 L	left on site	1	41–50		W
CT2	2024	HH	R	CL	1	yes	no	20 L	left on site	2	31–40		W/M
CT3	2023	HH	R	CL	1	yes	no	25 L	left on site	4	31–40	6–15	W/M
CT4	2023	HH	R	CL	1	yes	no	20 L	left on site	1	41–50		M
CT5	2023	HH	PU	CL	1	yes	no	20 L	left on site	5	41–50	6–15	W/M
CT6	2020	HH	R	CL	1	yes	yes	200 L	ornamental	2	31–40	6–10	W
CT7	2019	HH	R	CL	1	yes	yes	50 L	ornamental	2	31–40		W/M
CT8	2019	HH	R	CL	1	yes	yes	100 L	fruit trees	2	41–50	0–5	W
CT9	2021	HH	PU	CL	1	yes	yes	20 L	fruit trees	5	51–60	6–15	W/M
CT10	2018	NH	R	CL	2	no	yes	200 L	fruit trees	4	51–60	6–10	W/M
CT11	2010	NH	R	CL	4	yes	yes	80 L	left on site	25	30–50	11–15	W/M
CT12	2019	HH	PU	CL	1	yes	yes	20 L	left on site	3	51–60	11–15	W/M
CT13	2020	HH	PU	CL	1	yes	yes	200 L	fruit trees	2	61–70		W/M
CT14	2020	HH	PU	CL	1	yes	yes	200 L	fruit trees	2	41–50		W
CT15	2022	HH	R	CL	1	yes	yes	200 L	fruit trees	2	31–40	0–5	W
CT16	2020	HH	PU	CL	1	yes	yes	25 L	fruit trees	2	41–50		W/M
CT17	2023	HH	PU	CL	2	no	no	25 L	fruit trees	2	20–30		W/M
CT18	2023	HH	PU	CL	1	yes	yes	25 L	fruit trees	1	61–70		W/M
CT19	2023	HH	PU	CL	2	yes	no	20 L	fruit trees	4	51–60	11–15	W/M
CT20	2020	HH	R	CL	3	yes	no	20 L	agriculture	3	41–50	6–10	W/M
CT21	2001	HH	R	FR	1	yes	no	80 L	ornamental	2	61–70		W/M
CT22	2003	HH	R	FR	2	yes	no	80 L	ornamental	2	61–70		W/M
CT23	2020	HH	R	FR	1	yes	no	80 L	ornamental	4	31–40	0–10	W/M
CT24	2023	NH	PU	FR	1	yes	no	none	left on site	50	n/a	n/a	W/M
CT25	2020	NH	U	FR	1	yes	yes	80 L	left on site	5	20–40		W/M
CT26	2017	NH	U	AT	1	no	yes	80 L	left on site	22	31–50		W/M

CT = Composting Toilet; HH = Household; NH = Non-Household; R = Rural; U = Urban; PU = Periurban; CL = Chile; FR = France; AT = Austria; W = Women; M = Men.
Source: Author's fieldwork (2024–2026).

Composting methods range from prior dehydration and subsequent leaving of material on site in piles above the soil surface, to thermophilic aerobic composting with kitchen waste in the presence of rainwater. In both cases, microbes, fungi, worms, plants, rain, air, and sun take part in the process of co-creating soil. When urine is separated, it may be applied to fruit trees, infiltrated into the soil, or used in vegetable gardens. The resulting solid material is either left on site, used ornamentally, applied to fruit trees, or used in vegetable gardens. Carrying urine—either with solids or separately—requires greater physical engagement than infiltration through pipes. Similarly, transferring material to a compost pile entails more frequent and physically demanding labor than dehydration and emptying alone.

Most CTs in this study are in the Los Lagos Region, the southwestern Mapuche territory, a Chilean region with particularly high poverty rates and inequalities in access to health care, education, and basic services, and whose integration into global capitalism operates between neo-extractivism and luxury conservationism (Mondaca, 2017). During the first decade of the 21st century, the Chilean government declared near-universal urban sanitation coverage and wastewater treatment (Nazer Ahumada & Llorca-Jaña, 2023) and recent reports state that 100% of rural inhabitants have at least one basic service (United Nations, 2025). Regional, municipal, and health care authorities interviewed during this research are aware of an urgent but largely unspoken problem: the widespread use of pit latrines, cesspits, and malfunctioning septic tanks that contaminate surface and groundwater, alongside sewage networks discharging directly into lakes, rivers, and seas. Simultaneously, an increasing number of areas face summer water shortages and depend on trucked water. Even Puerto Varas, the region's wealthiest city, has repeatedly suffered sewage overflows in recent years, drawing media attention. In sparsely populated areas, the situation is described by a municipal official as "a silent pain" (Interview, October 2, 2025) that gets only exceptional media attention, as in the case reported on March 5, 2025, of a 79-year-old woman found dead inside her overflowing septic tank (Tapia, 2025). According to media reports—confirmed by the local neighborhood association—unable to afford maintenance, she attempted to empty the tank herself. In this context, CTs are officially framed as solutions for exceptional cases, such as remote or heavily polluted areas (Polivalente, 2018).

In southern France and the Austrian capital, in turn, after a century of expansion and consolidation of the flush toilet–sewer–treatment plant triad, the model is reaching a turning point driven not so much by present failure as by growing global critique concerning its ecological and economic sustainability (Öberg et al., 2020). The very idea of using water to flush excrement is increasingly questioned within circular economy imaginaries. Legrand (2020) notes that CT prototypes were constantly developed during the 20th century and, since the 1990s, have become central to the development of ecological sanitation. National and later Europe-wide organizations have given visibility to CTs in France since the mid-2000s, enabling dialogue with public authorities and leading to the legalization of domestic human excrement composting in 2009 through a revision of non-collective sanitation regulations. Austria lacks unified national regulations for CTs; their status is shaped by construction, water, and waste laws, and their domestic implementation is assessed on a case-by-case basis. CTs for public use expanded rapidly over the last decade: Vienna registered over 250 public CTs in use in the summer of 2024, and in 2026, there are over 450 CTs in use nationwide.

4.2. Auditing Care and Its Limits

Auditing care is typical of technocratic waste governance as it builds a particular form of response-ability by privileging audit compliance and technological solutions (Leung, 2025, p. 11). The ethnographic approach show how complex and fragmented sanitation governance is. Responsibilities cut across sectors, offices, and administrative levels; oversight and action are claimed from diverse actors at different stages. None of the stakeholders interviewed in this research feels fully able to respond either to the challenges identified as priorities by their offices or to the expectations of others involved in sanitation governance.

Sanitation efforts in the Los Lagos Region focus primarily on drinking water supply, understood as the population's main demand. Unsewered areas are referred to by local officials as "sanitation marginality" areas. Residents are expected to install septic tanks, considered within local technocratic imaginaries as safe and unproblematic, although officials are aware of serious challenges related to final disposal and frequent installation and maintenance failures due to topography, shallow groundwater, and limited vacuum truck access. Nevertheless, sanitary permits for residential projects consider almost exclusively septic tanks. Social housing relies on septic tanks, which tend to be the only known off-grid sanitation option for residents, and are also promoted for informal settlements, rural travel facilities, and remote areas. Overflowing tanks have environmental and domestic consequences; persistent smells, flies, and the inability to use toilets disrupt everyday life, turning the expectation of a modern home with a flush toilet into a nightmare. The "forget" in the "flush and forget" ideal remains, at best, aspirational.

In this context, CTs are framed as solutions for exceptional cases. A water official states that domestic CTs can obtain sanitary permits based on an existing regulatory framework (Polivalente, 2018), yet no such requests have been made, as most people are unaware of this possibility (Interview, February 2, 2025). Local authorities and officials express concerns about supporting CTs, viewing them as risky and highly dependent on users. They question people's willingness and capacity to manage CTs safely. The CTs in this research lack sanitary permits and their caretakers—as well as local architects, builders, and engineers promoting CTs—actually ignored that sanitary permits were available. Some have contacted the responsible office and were told that no mechanism was in place for authorizing CTs. Inspections, however, are extremely rare; none of the households has been inspected. In the absence of regulations and oversight, experimenting with low-cost, simple solutions is an option, but this limits broader CT adoption and promotes uncertainty among caretakers.

These local sanitation entanglements sustain a model that provides unequal and limited comfort at high social and environmental costs while remaining norm-compliant. Thus, in Chile, technocratic governance and the marginalization of community waste practices perpetuate the ethos of disposability and denial of modern sanitation practices. Internationally, CTs have also existed in a grey zone developing through oral transmission and practice-based learning for decades.

The 2009 legalization of domestic composting materials from CTs in France marks the culmination of a longer trajectory rooted in practice-based collectives (Legrand, 2020). Paul (CT21 caretaker), who has lived with CTs in rural France for 25 years, explains:

> Back then, nobody talked about dry toilets: They were neither authorized nor prohibited. A regulatory provision now allows the setup of dry toilets in private homes, but remains ambiguous. I had two

> inspection visits. The first reported, "No issues identified, no need for short-term work"; five years later, the report stated, "Admitted with reservations," without specifying which. I know that any time someone might show up and tell me, "That's not how it should be," and try to impose something on us. (Interview, July 31, 2024)

While regulations can improve visibility and expand the perception of CTs as a viable sanitation option, it does not necessarily reduce uncertainty. Norm-compliance remains a contested terrain, and community waste practices remain marginal in this form of care within prevalent capitalist-technocratic narratives for addressing socioenvironmental damage (Svampa, 2018).

4.3. Embodied Care and Its Limits

The CTs examined here rely on personal networks, prior exposure to similar infrastructures, and self-taught experimentation, thus on embodied knowledge generated through ongoing engagement. Main motivations for CT adoption, as shown by research on CTs in Europe (Guyader et al., 2022; Vetter, 2023), include abstract ecological values such as "not wasting water," "not polluting," "recycling," and "giving back to the soil what once came from the soil." While these values also play a role in the Chilean research context, the decision to install a CT here stems first from specific everyday challenges, including protecting local water sources, maintaining household habitability, and caring for the humans, animals, and plants that are domestic worlds in the context of sanitation marginality. Lower installation costs compared to septic tanks or market-oriented alternative infrastructures also play a role, both in Chile and France. Table 2 presents an overview of the perceived strengths and shortcomings of living with CTs.

Table 2. Strengths and shortcomings of living with CTs (caretakers' perspective).

Characteristic	Strengths	Shortcomings
Dry-composting infrastructures	Reduces water use Prevents pollution Produces valuable outputs Psychological and emotional well-being Inspires others	Limited prior information and technical guidance Unclear institutional status Social stigma Legal obstacles for valorization Uncertainty about output uses
Self-built	Lower setup and maintenance costs Adaptable to specific needs Allows for quick or simple modifications	Design depends on users' networks and abilities Requires study, time, and physical effort
Self-maintained	Foster ecological awareness, responsibility, competence, and self-esteem	May increase domestic labor Requires physical effort and ability Uncertain long-term care capacity Responsibility for failures

Source: Author's fieldwork (2019–2026).

Stigmatization related to non-water-based sanitation has been central to the expansion of conventional sanitation as a material reality or aspiration. The flush toilet remains a synecdoche for modernity, and the management of bodily excretion functions as a site for class and other forms of othering. CTs, at first glance, do not seem to challenge this.

CT caretakers in Chile emphasize that CTs are commonly associated with pit latrines, thus with poverty and marginality. Gloria, CT9 caretaker, recalls:

> When my husband first suggested that we have a dry toilet, I said, "Are you crazy? I'm not going to have a pit latrine in the house." It's a rather small house, so I thought, "Just imagine the smell in here. No, no, not in my house!" (Interview, April 15, 2025)

This was five years ago. She later visited a friend, a European migrant who had one, and did some research. She found an online course, took it, and together with her husband, adapted their friend's model:

> Actually, it's a perfectly normal toilet—a nice one, the kind you actually want to use. It's not a horrible latrine. It's comfortable, close to the living area, the dining room, the kitchen, and the house doesn't smell at all. This needs to be demystified right away: A dry toilet is not something awful! (Interview, April 15, 2025)

In a context where CTs remain little known, she is able to overcome her class anxieties largely due to her social privileges. The need to show how contemporary CTs look is also shared by other CT caretakers (Figure 1).

Figure 1. Four contemporary CTs: (a) CT22; (b) CT9; (c) CT1; (d) CT20. Source: Author's fieldwork (2024–2026).

Although CTs are increasingly visible in Europe, Ivonne, who manages a French composting cooperative (CT25), also sees the need to clarify that not only the comfort, aesthetic, and sensory experiences are important while using the toilet, but also how CTs process excrement:

> Digging a hole in the ground and relieving ourselves is not a dry toilet. A dry toilet—or what I prefer to call a composting toilet—means organizing urine and feces so that they compost. We use containers (80-liter construction buckets) into which people deposit their excreta and then cover them with

> wood chips. Composting requires moisture and oxygen, and the wood chips allow oxygen to circulate. We are not just dealing with human excrement; we are genuinely dealing with compost. (Interview, August 1, 2024)

My household (CT20) is the only example in this study that uses CT compost in vegetable gardens. Two others (CT2 and CT10) intend to do so but have not yet produced sufficient mature compost, while CT21–23 reported no need for this organic input; they would use it if required. Our composting process involves layering fermented urine, excrement, and cover material (sawdust mixed with wood shavings) with kitchen waste and other organic matter in a composter, covering it with straw, and allowing microbes, fungi, worms, rain, air, and sun to decompose and recompose the material. Temperatures reach up to 70 °C for about four days and remain above 55 °C for periods ranging from two weeks to over a month. Once no further material is added, the composter rests for two years (see Figure 2). We then use the compost even for tuber crops, a practice strongly discouraged by local permaculturalists, as Rocio, CT6 caretaker, told me.

Figure 2. Two thermophilic composters: (a) CT20; (b) CT1. Source: Author's fieldwork (2024–2025).

Rocio is one of three counterparts in this study who learned about CTs through permaculture courses. Her model's operation and maintenance involve urine diversion through pipes and feces dehydration using sawdust and grass as cover materials (see Figure 3). She is very satisfied with it but has begun to regret not using the output for vegetables:

> I would have much more organic fertilizer if I were 100% sure that I could use it, but I remember that there was an issue with temperature to promote compost fermentation, and as far as I know, my system does not ensure that. (Interview, December 30, 2025)

She deposits her CT content after a six-month resting period around flowers, some of which she eats, and when Swiss chard grew in the place where she deposits her CT content, she ate it, experimenting with herself beyond the limits of her advisors.

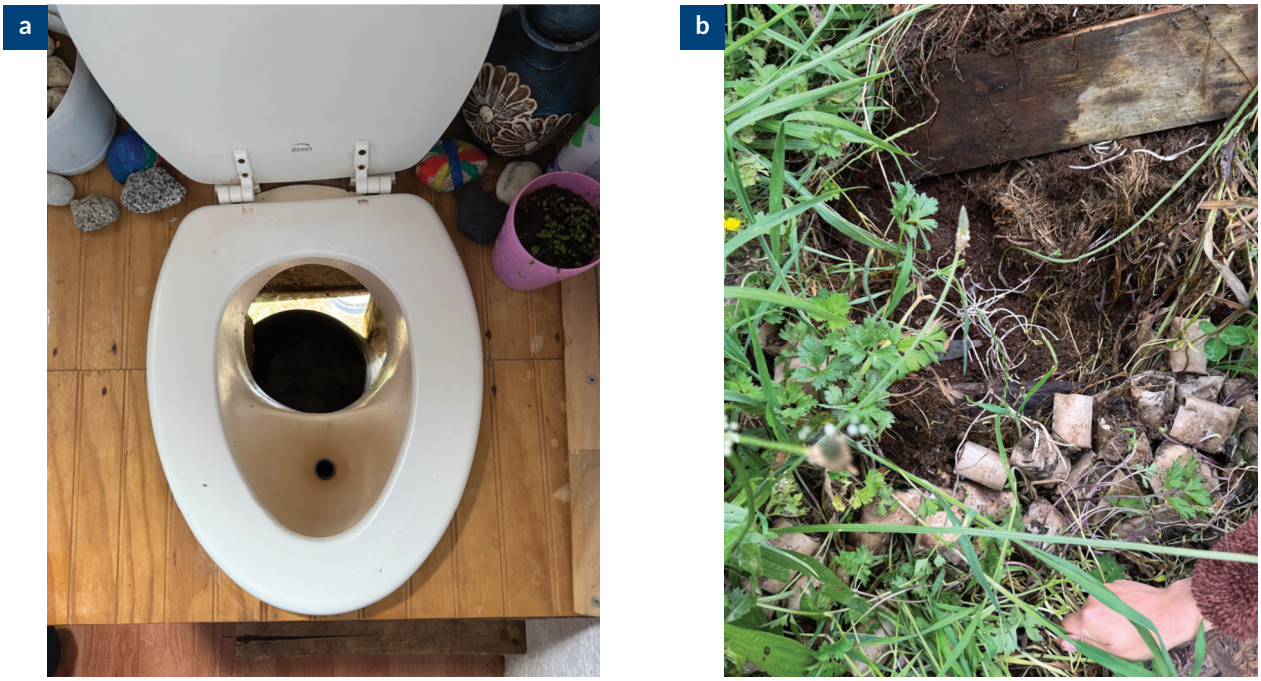

Figure 3. CT6: (a) Toilet with urine diversion; (b) container contents after six months on site. Source: Author's fieldwork (2025).

As Gloria's and Rocio's experiences show, ongoing embodied engagement with CTs transforms how we feel, think, and engage with personal and collective ideas about them. Anxiety about smells, flies, or other perceived nuisances tends to dissipate quickly. Most caretakers report a simpler and more comfortable experience than anticipated, both in using their toilets and composting their contents. A visual, tactile, olfactory, and auditory retraining takes place, varying by design. For example, a greater distance between toilet seat and container means users do not see their excrement, sometimes experienced as a loss, since it can be one's health indicator. A shorter distance intensifies visual and tactile contact, such as sensing temperature. Smell often requires the most significant retraining. While some caretakers remain uncomfortable even after years and continue adapting their systems, others "really like" the smell, describing it as earthy, fresh, or fermenting. However, hesitation regarding the safety of CT outputs persists, pointing both to potential risks awareness and the enduring status of human excrement as dangerous.

CTs change over time; people adapt materials and processes based on experience, advice, and the possibilities and limitations "shown" by other beings which actively affect CTs. CT materiality is changed, including the materiality of containers and other parts of the infrastructure, and, more obviously, that of excrement. Through material and affective engagement with the compost pile—viewing, smelling, touching, measuring, or feeling its temperature—people aim at creating the best possible conditions for the life of soil co-creators to thrive, while seeking to suppress potentially hazardous beings. They experiment with different cover materials and mixtures, additives, times, and spaces for composting. In this way, they cultivate response-ability—the ability to respond—grounded in an affective understanding of themselves as part of a web of naturecultural interdependencies.

Repeated practices shape how our bodies feel and the forms of reason that make actions and affects meaningful (Hawkins, 2006). Excrement-care relations develop through direct material engagement, social

learning, and place-based adaptation, generating knowledge through bodily involvement and a gradual sensory retraining toward a "more nuanced understanding of material transformation and ecological continuity" (Leung, 2025, p. 15). Yet the forms of reason shaped through this embodied care do not fully counter prevailing rationalities. In the next section, I explore how embodied knowledge shapes a renewed relation to excrement as matters of care.

4.4. Com-Passionate Composting: Towards a Renewed Relation to Excrement

If care is the ethics and politics concomitant to life's everyday materiality, as Puig de la Bellacasa suggests (p. 255), from a processual perspective it can be practiced individually but remains connected to collective endeavors. Thus, CTs as ethic-socio-technical everyday assemblages could counter neoliberal self-care hegemony. In the cases explored here, however, CT setup depends on social privilege—material resources, formal education, and access to information—so CTs may reinforce rather than question neoliberal self-care and self-responsibility. Especially in Chile, where social housing and state subsidies remain constrained to septic tanks, more privileged people may be able to implement CTs, while the most marginalized remain excluded and constrained to conventional infrastructures.

For most research counterparts, the initial motivation to set up a CT was pragmatic. Nick (CT22 caretaker) installed a CT with his wife 24 years ago, when they moved to rural France, after seeing his first CT at his neighbor's (CT21): "It just seemed logical not to pay to install a water-based toilet—much cheaper," he recalls. Reflecting on the difference between flush and composting toilets, he explains:

> It seems absolutely crazy to flush your toilet with fresh, drinkable water and then have to clean it. That's the first thing you realize when you see there are other solutions. From that moment on it just seems absurd. You feel the same when you go to other people's places or into town and realize that is what's happening. It's obviously easier to have a water toilet with a septic tank or sewage. You do your business and don't have to worry about it anymore—you're no longer responsible. But environmentally and morally, that seems crazy too. Here, we have to deal with it—when the bins need emptying, they have to go somewhere. That's the big difference: You are responsible for your actions, for your natural actions. (Interview, July 31, 2024)

Although for CT caretakers in Chile it may not be "obviously easier" to have a flush toilet—and some even describe CTs as simplifying everyday life after years of dealing with poorly installed septic tanks—living with CTs entails a profound shift in terms of the relations to excrement: from perceiving it as dangerous or disturbing, to be ideally flushed and forgotten, to acknowledging it as a generative and valuable material one is entitled to care for.

Hawkins (2006) notes that "while the rich may have always been able to outsource management of their shit, the poor had to deal with their own portable containers" until the introduction of mass plumbing made distance from one's own excrement widely accessible (p. 57). Distance from one's own excrement has never been so wide in the Los Lagos Region; in other parts of the world, people still have "to deal with their own portable containers," an experience that shapes social and racial inequality (Dube et al., 2023). This study includes people whose social position would exempt them from such labor, yet who choose to engage in it. Under these circumstances, even when initially compelled by infrastructural constraints, many find in CTs more than anticipated. Aurora, manager of an outdoor educational site (CT11), explains:

> We came to dry toilets because we were forced by reality—there is no water and no sewage system here. We thought it was a good opportunity for education in ecology, in the traces we leave, and in taking responsibility for our waste. But it also became an opportunity for learning how to approach everyday issues like the poop and pee we all produce but nobody talks about. It opens conversations about shared emotions, thoughts, and processes that social life usually silences. (Interview, April 3, 2025)

When not experienced as reinforcing social inequality, taking care of one's excrement has significant affective and ethical transformational power. Marcela, CT1 caretaker, recalls carrying buckets with urine, feces, and cover material to the composter:

> Through that exercise of care—moving things, emptying the buckets, washing them, letting them dry in the sun so they don't absorb too much smell—I began to understand not only what others had told me, but what came from intuition, from letting myself go. It's like a dance, reconnecting with something so human and so forgotten, as if we pretend "this part isn't mine," "I'm human, but I don't poop." It's absurd; I laughed a lot: "I'm human and I poop." I loved that exercise. And here I am, composting. (Interview, December 4, 2025)

Composting excrement situates humans in a "web of living co-vulnerabilities" (Puig de la Bellacasa, 2017, p. 293) and can be grasped as a com-passionate act of care insofar as it requires feeling with many other beings and being attentive and attuned to relations with and among them—not only in the compost pile but also in the entire composting infrastructure. This includes one's own body, the bodies of diverse macro- and microscopic beings, things, and other elements with which soil is co-created (see Figure 4). It is a dance requiring feeling with human and more-than-human others, and involves interdependency as well as communication through doings, affections, and sensibilities.

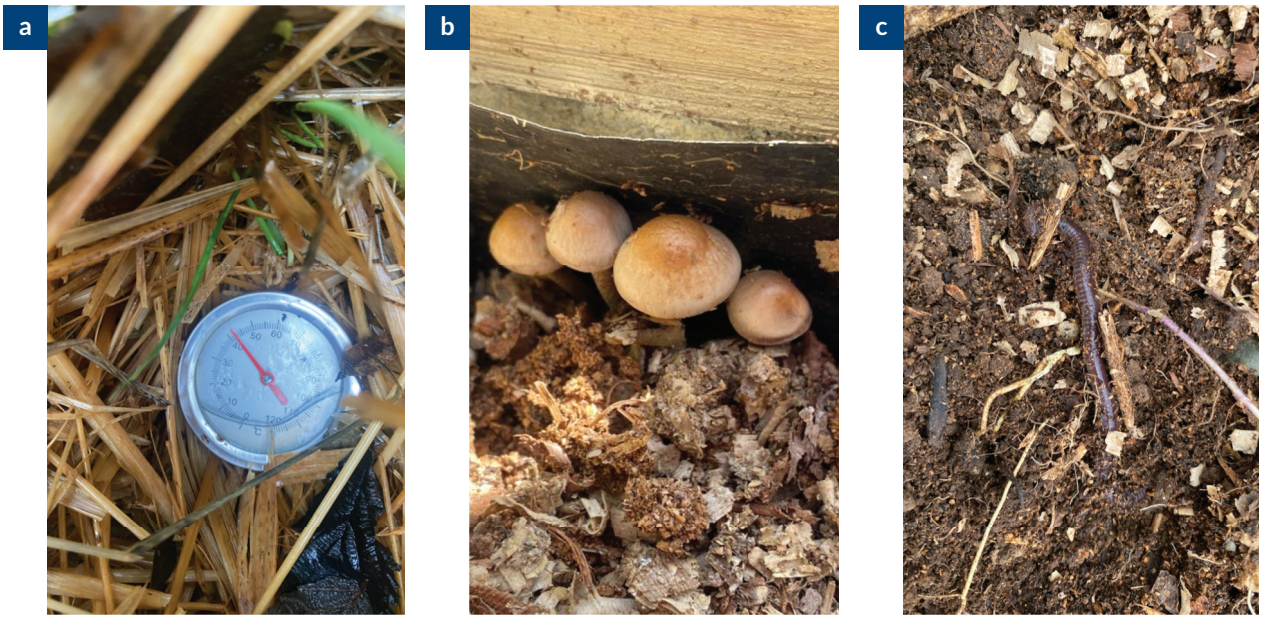

Figure 4. Soil co-creators (CT20): (a) straw cover of the composter with thermometer showing descending temperature, tree leaves, and emerging sprouts; (b) fungi in the "open" composter (first cover removed); (c) earthworms exposed during composter emptying. Source: Author's fieldwork (2024–2026).

In everyday practices, when taking care of excrement an ethical obligation is performed; excrement management can be understood as a matter of care to be engaged in through composting as an ethical doing. As Marcela says, this "literal and metaphorical exercise in taking responsibility for your own shit":

> Connects you with the whole process of what your shit means, ultimately with what you feed on and what it means to be human. It connected me deeply with all of that. It's like rooting oneself in the earth; it's like becoming embodied again. (Interview, December 4, 2025)

If ethics are embodied and emerge out of experiential networks of obligation (Hawkins, 2006), com-passionate care, performed through composting one's excrement, involves fostering a caring relation to excrement situated within affective interdependent entanglements. The affective dimension of the com-passionate entanglement becomes evident in different ways. CT caretakers report physical and psychological discomfort when using flush toilets through expressions like: "It hurts to flush 20 liters of water away," "I feel guilty," "I feel misaligned with the world." This misalignment reveals what is missing from the picture of com-passionate composting outlined here.

The embodied experience of being integrated into metabolic cycles remains fragile when unsupported by political collectives able to decide which forms of care and which technologies sustain collective flourishing: i.e., to collectively choose convivial infrastructures.

5. Closing: Com-Passionate Composting as a Future Horizon

I have examined CTs as matters of care—intertwining practical labor, affections, and ethical obligations—and explored how the everyday practice of composting one's excrement reconfigures naturecultural relations among bodies, environments, and other beings. I have argued that this practice constitutes a com-passionate form of care within affective interdependent entanglements. Composting one's excrement implies com-passion as being-with in shared doing and feeling with nonhuman soil co-creators and other entities that constitute CTs. It opens fragile yet meaningful horizons for collective well-being in contexts of infrastructural neglect and socioenvironmental injustice.

Amid persistent inequality, racism, and the normalization of extreme forms of extractive and exploitative relations in human and more-than-human worlds, CTs may transform subjectivities and advance another ethos in human–waste relations. They may even be understood as personal-collective doings, as composting is a collective endeavor. However, this ethos remains largely confined to individual response-ability and risks producing new forms of social exclusion insofar as norm compliance remains prevalent within sanitation governance, even when the empirical performance of promoted technologies is deficient and exclusionary.

To conclude, I return to the story with which I began: this year's potato harvest, brought forward due to the *pilme*. The compost we produce is not enough to prepare the soil. August, when sowing takes place, was as busy as December. Just as we could not spread urine each morning to protect the growing potato plants from the *pilme*, we also lacked time to prepare the soil by adding sheep manure from a neighbor and seaweed from the shore, an ancient practice that has served us well in the past.

No matter how passionately we care, no matter how much help comes from our com-passionate more-than-human collaborators, another "com" is missing. Although it is not quite here yet, it is a future horizon that pushes us forward while demanding more care. It is the "com"—the with—of many other humans. A society where excrement management becomes a shared matter of care, and where people, through the diverse labors they undertake, can fulfill their obligations to care for an interdependent earthly other—not in haste, but with the time, attention, and affection it needs and deserves—a society that truly values everyone's contribution to the flourishing of collective life.

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Conflict of Interests

The author declares no conflict of interests.

Data Availability

Data can be shared upon reasonable request to the corresponding author, subject to institutional ethics and confidentiality protocols.

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