



# Wild Design: Delving into Circumstances Prevalence with Gambiarra and Gardening

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DOI [10.34626/xcoax.2023.11th.138](https://doi.org/10.34626/xcoax.2023.11th.138)

Wild Design is an artistic research framework attentive to circumstances prevalence in human-environment relationships. It provokes through today's polemic associations to the word “wild” and the presupposed definitions of “design” to think about the environment beyond naturalistic terms and to recognize decentralized forms of human agency — finding in the interface between ecology and cybernetics a ground to trouble and mend the environmentalist discussions of our times. *Gambiarra* and different examples of neotropical small scale food production systems, namely creole gardens and *quilombola* horticultures, support the research with models of open, process-oriented and complex networks emerging from feedback between humans and environment. A politics of responsibility is drafted from noise-information relationships based on undecidability and engagement. The research invites the imagination of media and generative arts beyond a technocratic paradigm.

**Keywords:** Gambiarra, Creole gardens, Quilombola Horticulture, Environment, Design, Responsibility, Circumstances.

## 1. Wild Design

Wild is a term intrinsically linked to an anthropocentric perspective on responses to the circumstances and the environment. When it comes to plants, animals and landscapes, it antagonizes with tension and ambivalence *domestication*, in its vast definitions (Clement et al. 2021). In anthropological and ethnographic terms, the word “wild” touches on polemic colonial implications opposed to imaginaries of *civilization*, which makes the embracing of the terminology almost a taboo among many of today’s critical theorists (de la Cadena 2015; Tsing 2015). In the everyday, wild is synonymous to non-conforming, marginal, irrational..., deviating from a normative behavior model based on discipline that, just like the previous connotations, is restricted by conventions formed throughout eurocentric and US-American cultural traditions, not to say, white. Wild also plays off a notion of govern and regulation dictated by planning, control, order, caution, practicality, formality and frugality, typically found in human-centered closed systems.

Likewise, Design — often untranslated from English — implicitly assures human domineering agency over processes. Mostly uncontested, design is a pivot of the technocratic regime that has its apex taking place nowadays. Design is not a neutral activity, but rather a political one deeply embedded in long lasting and prevailing social and technological systems, with designer’s mindset reflecting certain political and economic values that have profound social and ecological consequences. Designers’ choice-making often operates within a narrow technical framework that starts at a visceral, essential and unquestioned level. Rooted in technological determinism, Design supports technology in shaping society in ways that are often invisible and difficult to challenge (Winner 2020). This research calls attention to the ways in which Design tends to marginalize a variety of undertakings and, by doing so, becomes unresponsive to new circumstances, namely to the emerging changes in and of environments.

The combination of Wild and Design is a provocation that unleashes an array of creative contradictions, making space for shifting human-environment relationships and design away from their hegemonic conjecture — questioning the anthropocentrism of design and the non-anthropogenic, or further, non-Western connotation of wild. The practice of *gambiarra* displays an alternative form of design differing radically from conventional design because it does not come from formally trained, engineer-minded, projects. The word *gambiarra* comes from Brazilian slang and describes an intervention or artifact meant to provide a provisory solution to an unexpected event or crisis with the available resources at hand. For example, a glass window breaks and it’s covered temporarily with a plastic trash bag cut open into a tarp and fixed with tape. As it offers no perma-

nent solution, it opens room for further accidents and is messy, especially if compared to a conservative model for creation that praises human predominance, soundness and efficiency. At the same time, *gambiarra* features inventiveness, adaptation, improvisation and resourcefulness in times of necessity. Being both an action and an artifact, *gambiarra* reveals a process that develops an object in a spontaneous way — starting from an unexpected situation, based on an instantaneous insight, inspired by a particular need or disposable material resource, providing the constitution of an artifact in a momentary improving way (Bonfleur 2006). It can only emerge from something else and it's never at a final state. This openness in *gambiarra* exposes cognitive, material and aesthetical complex networks (Bruno 2017). Both aesthetically and ontologically, *gambiarra* provokes technocracy at its core, as every *gambiarra* does not perpetuate a pre-existing model but distorts it. Moreover, both a *gambiarra* or *doing a gambiarra* unveil an open system in which human agency is responding to the circumstances, namely, to the environment in a decentralized communication model.

Examples of neotropical small scale food production systems reinforce the aspects of *gambiarra* that this paper calls attention to. Many features of creole gardens found in the Caribbean and *quilombola* horticultures present in Brazil also illustrate an open system, in which agencies, including human, are distributed and dynamic, and complexity and diversity are bred through processual feedback between humans and environment. In these unique examples of cultivation practices, human agency is also not engineering processes, but dynamically developing into and together with the system. Creole and *quilombola* gardens are small household level plots originally fostered by enslaved people for nutritional, medical and emotional provision, in which its design contrasted utterly to conventional agriculture, especially the one practiced by their neighboring plantations. Their design does not stem from a “tabula rasa” situation as in European forms of agriculture (even permaculture) in which the soil is prepared, seeds are planted, the ground is hoed until harvest leads to a repetition of the cycle. Here the human cultivating agency is predominantly a type of *landscape management*, constantly adjusting in dialogue with the multiple processes occurring in the system across time, in which adaptation to the circumstances prevails over reinforcement of a pre-existing structure (Levis et al. 2018).

The research adds to a current polemic ground present in discussions about *rewilding* (Monbiot 2013; Plumwood et al. 1998; Prior & Brady 2017). Rewilding exposes many limitations in human's attempt to formally reconnect to “Nature”, given our prevailing infra-structures and the socio, economical, political and ecological history of the last centuries. Despite advances in critical theory, most environmentalists, together with regulators and policy-makers are still grounded in binary and naturalist assumptions about the environ-

ment that were considerably founded in European and US-American world-views consolidated during Enlightenment and Romanticism (Cronon 1996; Ward 2019). Those also hold connection to previous imaginaries about “wild life” that can be traced back to European speculations about the “new world” in the early centuries of South American colonization (Mello e Souza 1986).

Throughout this paper, “circumstance” is a synonym to “environment”, the environment being understood not only as the “natural”/ biological, physical, social, cultural, economic, and political factors, among others, but also events and factors that continually shape and are shaped by any given system (Meadows 2008). Referring to theories and practices that radically embrace the creative tensions existent in *natureculture* indeterminacy (Haraway 1991; 2016), this research aims to sketch a model of responsibility based on openness and adaptation. For that, Vilém Flusser’s notion of responsibility in dialogue with the notion of *response-ability* (Haraway 2016; Puig de la Bellacasa 2017) will support a relation between design and care based on feedback loops that sustains the human-environment relationship in question. Michel Serres’s *The Parasite* complicates the presence of indeterminacy and undecidability present in this argument, bringing strange loops that demonstrate the negentropic attributes of “wild design”. The dynamic noise-information relation displayed through the threading of all these sources make evident the confluence between cybernetics and ecology, proposing “wild design” as a de-alienating and anti-technocratic form of human-environment communication.

Wild Design recognises the importance of non-human agency in shaping environmental discourses. This research argues and hopes to contribute to the thinking of environmentalism not only in terms of preserving biodiversity and ecosystems, but also recognizing relationships between humans and the environment that engage with noise and evolve with it in continuous movement, instead of insisting on established information that fulfills its entropic prophecy. Within the arts, particularly media and generative arts, the ideas discussed in this article can find a playground to embody new imaginaries within an axiomatic definition of creativity. Wild Design invites us to think of art and technology beyond a technocratic paradigm, offering counter narratives on AI and general representations of cybernetics in the arts. The ambivalent symbolic and material realities presented here make space for aesthetics of interactivity and feedback that manifest outside the techno imagination and its materialities built in the past century — reinforced by climate change with apocalyptic anxiety.

## 2. *Gambiarra*

“*Gambiarra*” is a Brazilian slang term that refers to a makeshift or improvised solution to a problem or situation. It often involves using whatever materials or resources are available to come up with a creative solution, even if it may not be the most elegant or efficient option. *Gambiarras* can range from simple fixes like using duct tape to repair a broken object, to more complex solutions like creating a new device by combining parts from different sources. The word *gambiarra* can refer both to the artifact generated for solving an expected situation, as to the process of coming up with the provisory solution.

*Gambiarra* is intertwined with the industrial model of production and consumption of objects, taking place from its limits and impacts (Bonfleur 2006). In many contexts, *gambiarra* emerges precisely because of excesses in consumption and waste that go along with unequal distribution and access to goods and technology on a global scale. The reuse of materials and collected everyday objects centers on a tendency to associate *gambiarra* to sustainability approaches and to DIY cultures, praising its resourcefulness, hopefulness, engagement, and restorative qualities, along with its insubordination to an oppressive sociotechnical reality. These qualities are relevant to the scope of this research, however it is important to highlight that *gambiarras* are unstable, often wasteful, dangerous and always maintaining an openness to further events that could result in additional unexpected crises. Beyond the timely resources *gambiarra* provides for counteracting the practices that constitute our current socio-ecological crises, its contradictions and ambivalences are the main generative properties that this research aims to elaborate upon.

In the past decade, *gambiarra* marked a niche in critical theory and media arts, especially within the strengthening of *repair* in discourses, arts and regulation (Fonseca 2015). What was once an anecdote is becoming a familiar concept within the realms of decolonial design and technology, electronic arts and maker culture, as well as in environmentalist discussions.<sup>1</sup> The Brazilian media art collective *Gambiologia* has become the most known representative of this universe internationally, being active for 15 years in collective processes of critical and creative reinvention of obsolete devices and media. The group’s approach to blending contemporary and folk art involves fostering an open and informal atmosphere during interactions among artists, the public, and objects. Rather than simply recycling, they view reuse as an expressive tool for creating art using an abundance

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1. For a detailed parkour on art projects and scientific publications, see de Paula Antunes 2023, *Wild Design: Gambiarra, Complexity, Responsibility*. A library of resources about *gambiarra* is also available on the website of the Coletivo *Gambiologia*: <https://www.gambiologia.net/blog/biblioteca>, last accessed on 10/05/2023.

of discarded materials. Through the use of “low-technology” and collecting materials with the intention of transforming them, their work encourages critical reflection on the issues of accumulation and appropriation. They seek to give new meaning to discarded objects and celebrate the hacker culture for its disruptive practices. Overall, their work aims to subvert established systems and promote new ways of thinking.

On the edges of technocracy, *gambiarra* is disobedient to the rigid topologies of Western objects, in a constant pursuit for (co)autonomy and decolonization of design. Ernesto Oroza elaborates an *architecture of necessity*,<sup>2</sup> which is particularly relevant in the Cuban context due to its political situation and the US trade embargo. Oroza’s take on technological disobedience is informed by Thoreau’s civil disobedience, but in the context of Cuba, it takes the form of a rejection of Western objects’ identity and inflexibility and a challenge to the authority of technology. Like many authors concerned with decolonizing technology, Oroza believes that subversion and the pursuit of autonomy are essential in a technological landscape where components are seldom designed from scratch and are instead imported from specific foreign production and consumption contexts. These rigid topologies, with their implicit biases, perpetuate a cycle of exploitation and oppression by enforcing a network of modes of being and interacting that *architecture of necessity* contests and overturns.

Inspired by Oroza, Giuliano Obici brings *gambiarra* to sound experimentalism exploring the creation of musical instruments and generative sound artworks, with an emphasis on improvisation, practical readjustment and reverse engineering — challenging product and industrial design and embracing the risk and instability of an object’s use. This approach represents a form of technological disobedience, in which *gambiarra* is an “emergent behavior in this ecosystem, which deals with unconventional solutions, and comes to encompass a spectrum of applications and uses related to the context of a culture mediated by technology.”<sup>3</sup> (Obici 2014, 10).

The consolidation of Repair Studies<sup>4</sup> has allowed tracing and analyzing different forms of maintenance practices, contributing in various ways to the research of *gambiarra*. The project Tales of Care and Repair<sup>5</sup> has *gambiarra* as one of its pillars through the participation of Gambiologia, which worked together with Toxic Link from

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2. <http://architectureofnecessity.com/>, last accessed on 10/05/2023.

3. Translated by the author.

4. Although this article’s sources about *repair* are concentrated on Repair Studies within the scope of technological and material culture, it also reverberates with the notion of *repair* within a post-colonial and decolonial context, in which *repair* also entails challenging the power structures and worldviews that have enabled colonialism and maintaining a critical perspective on the ongoing effects of colonialism in the present.

5. <https://tales.repairacts.net/>, last accessed on 10/05/2023

India and Repair Acts from the UK. The ‘stories’ of repair compiled throughout the project point out to the intrinsic relation between repair and processes of de-alienation, contesting the material culture of our times. Discussing climate change, craft and traditional practices, environmental reparations and repair economies, *Tales of Care and Repair* fosters restorative centered behaviors and lifestyles, developing with different communities the “Care and Repair Declarations”, aiming through repair cultures for a restorative future. The link between care and repair reinforces a human-environment interaction based on feedback, which is central to a politics of responsibility that shall be discussed later in this article.

In the issue 6.1 of the publication *Continent*, fully dedicated to Repair, one of the editors, Lara Houston, describes “the emergent dance of object and environment” that populates most texts of the edition, indicating that the human engagement that defines and connects humans and the (built) environment “is no less central to human engagements in what we once called, rather quaintly and before the anthropocene moment, the ‘natural world’” (Houston 2017). Many articles of the edition differentiate the “tabula rasa” situation performed by designers from the processual character of maintenance. Designers of different crafts are portrayed thinking of their creation in terms of purity and conceiving within the premise of resistance to change, holding their knowledge about their creation to the eternal temporality of an initial design. Cultures of repair and maintenance let go of designs to make room for the emergent life of an object, which could never have been fully known in advance. Notions such as *enacted objects*, *fluid objects*, *repair-scapes*... raise concerns about objects’ openness and capacity to be taken care of, presenting the processual character of materials, which in their state of flux always exceed stable object positions or signifiers.

Overall in Repair Studies, there is an attempt to demarginalize repair from the authority of engineering. Repair and maintenance seem to be constantly fighting a subjection from design, implying that repair is not design. Thinking of repair and maintenance from the perspective of *gambiarra*, this research contests this dualism and differentiation, and proposes that a design process is occurring through *gambiarra*, however a non-human centered model of design that responds to emergent circumstances, namely, is in dialogue with the environment. Here ecology and cybernetics intersect, understanding intelligence neither as human or human made, neither machinist, nor exclusively inherent to a biological system or the environment at large. Through *gambiarra* it is possible to understand intelligence as a dynamic, context-dependent process, rather than a fixed attribute of an individual or system. Intelligence evolves from the ability to sense and respond to changes in the environment, to adapt to new conditions, and to engage in complex feedback loops with other components of systems. *Gambiarra* can be read as an

emergent behavior part of complex, non-linear, and dynamic design processes between humans and the environment, as well as the various non-human actors and systems that shape those relationships.

Fernanda Bruno examines *gambiarra*'s resourcefulness and shamelessness, exploring its cognitive and political potential in dialogue with Gilbert Simondon's ideas. The traditional design paradigm views an object as a self-contained entity, separated from both the designer and the consumer. Despite being used and developed in close proximity to humans, this closed system doesn't allow for true human intervention, it finds no point of insertion. Bruno subverts this notion of integrity by emphasizing *gambiarra*'s audacity, exposure, open-endedness, and mundaneness, which not only have an aesthetic impact but also cognitively reveals and unsilences entire socio-technical heterogeneous networks of human and non-human agencies involved in the production and maintenance of objects. *Gambiarra* operates in a "regime of open knowledge" that is common, shared and collective, from its materiality and origin to its assembly and use. This approach runs counter to the process of encapsulating the network of actors and mediations necessary for the production and maintenance of technical entities, which leads to the consolidation of technical objects into black boxes, as described by Bruno Latour and Vilém Flusser (Bruno 2017).

"By returning uncertainty to the world, *gambiarra* makes it possible to indicate that other worlds are possible."<sup>6</sup> (Assunção & Mendonça 2016, 111). Every *gambiarra* is a small gesture of liberation that corresponds to an immediate response to a complex communication process that is entangled with the environment. It is not necessarily environmentalist as described by a mainstream notion of how humans should operate in order to protect the environment, however it shows clearly how it interacts with signals and events in a much more open mode than design as it is commonly accepted. *Gambiarra* is negentropic in that it is able to interact with noise in the generation of new information, unlike systems of design that, by being too ordered, become rigid and unable to adapt to new information (Taylor 2001).

*Gambiarra* embodies creativity and resourcefulness that challenges the assumptions of technocracy and the idea that all problems can be solved through primarily rational means. It is associated with a form of ingenuity that defies the formalized and standardized approaches of modern technology and engineering. At its core, *gambiarra* rejects the notion that only formal, technical expertise can produce legitimate solutions to problems. Instead, it promotes participatory and decentralized decision-making that accommodates



diverse perspectives and approaches to problem-solving, including non-human perspectives.

### 3. Neotropical Small Scale Food Production Systems

Some models of neotropical small scale food production systems take shape in a different background than *gambiarra*, yet share a similar role of humans in what comes to design. Examples of such horticultural gardens have been studied in the Caribbean (creole gardens), and increasingly more research is being published about similar types of cultivation in Latin America, with a variety of examples in Brazil (*quilombola* horticulture, (Carney 2021)). Creole gardens and *quilombola* horticultures, similarly found in kitchen gardens (Brierley 1978; 1991), slave gardens (Haraway 2015; 2016) and other manifestations of tropical household level food production (Niñez 1984; 1985; 1987), are forms of small scale food production systems found in neotropical regions. Their early forms differed significantly from traditional agriculture, particularly those implemented by nearby plantations. Unlike European agricultural methods necessary within temperate climates — which involve preparing the soil, planting seeds, and repeatedly tilling the soil until harvest is reached as the ultimate purpose of the system — their designs did not originate from an engineered plan. In contrast, creole and *quilombola* gardens have been usually small, crowded and multilayered, mixing trees with other-sized plants and requiring minimum human maintenance, while being highly productive and with optimal soil conservation, perceiving harvest as a stage of a continuous open-ended process.

Agriculture as it has been previously established holds direct traces to the demands imposed by geographies that experience four seasons. Creole and *quilombola* horticultures present strategies that are situated in tropical climates and allow a more process-oriented, non linear approach than agricultural cycles necessary to adjust to spring-summer-autumn-winter repetitions. Those strategies often combined indigenous forms of landscape management present in the neotropics for at least fifteen thousand years (Clement et al. 2021) and African tropical food production systems brought by enslaved people to the neotropics during colonization (Niñez 1984), that bypassed the european forms of agriculture that lead to develop the plantation system (Haraway 2015).

In these systems, human efforts in cultivation primarily involve *landscape management* that continually adapts to the various processes taking place in the system over time. Rather than reinforcing pre-existing structures, the focus is on adapting to changing circumstances through ongoing dialogue between humans and the system (Levis et al. 2018). Among the many reasons for the richness alongside the low maintenance of these food production systems is the fact that

humans focus on individual plants, rather than populations – as is typical of agriculture (Clement et al. 2021). The entanglement between species found in these models consolidates systems of distribution and mutual support that Édouard Glissant compared to Deleuze and Guattari’s notion of the rhizome (Diawara 2010).

Historically, the contrast with the plantations dominating the surroundings of slave gardens is evident. Donna Haraway comments on it together with her notion of *refuge* (Haraway 2016). According to her latest works, any intense change, no matter how it brings new and increased complexity, requires spaces of refuge. The same happens in agriculture. Agriculture is a strong element for human intervention on earth and the way it has been implemented since colonization, and intensified with globalization and the agroindustry, offers no refuge for species and relations. She states that slave gardens present stories that need to be told, in order to “gather up the complexities and keep the edges open and greedy for surprising new and old connections [...] Nurtured in even the harshest circumstances, slave gardens not only provided crucial human food, but also refuges for biodiverse plants, animals, fungi, and soils. Slave gardens are an underexplored world, especially compared to imperial botanical gardens, for the travels and propagations of myriad critters” (Haraway 2015, 162).

The encounters taking place in these multiverses reveal human gestures and a presence that break out from trivial patterns of oppression and self-regard. The little existing literature on slave gardens reinforces its emancipatory qualities: being essential during colonization to assure food diversity and security, also after abolition of slavery, it allowed subsistence to the broader plantation community, and “more-than-food” to the forsaken workers – their gardens were a space of emotional, spiritual and environmental connection in times of rupture and tragedy. Early writers were impressed by the density and variety of crops, the dominance of food trees over vegetable crops, and the fact that such a small plot could support a “numerous family” (Kingsley 1872). Likewise, the same few colonial historians writing about the topic were troubled by their “crowded, confused, and haphazard” aesthetics (ibid.).

Many contemporary examples of household level food production also share fundamental aspects with creole, *quilombola* and former slave gardens all over the American continent. The world-wide researches compiled by Vera K. Niñez at the International Potato Center in Peru during the 1980s bring light to a diversity of cultivation practices outside of “agriculture as we know”, therefore underlining how American colonization – whether for settlement or exploitation – has suppressed many of these knowledges with a consistent negative impact on the environment and on people’s autonomy and self sufficiency. With a goal of making policy, Niñez’s research turns

out to be valuable documentation of complex systems of entanglement between humans and their environment, in which humans are actively altering and engaging with their environment through an architecture where their agency does not overrule the agency of the others.

Emma Siliprandi's research on women and agroecology also offers detailed description of the process-oriented cultivation practices found in the domestic space across Brazil, converting through the evolution of household level gardens such well-known spaces of subjection — domesticity — into a political platform (Siliprandi 2015). In their own contexts, creole and *quilombola* gardens represent open, diverse, adaptive yet resilient forms of providing for human needs in a dialogical and sustainable human-environment relationship. They historically articulate a space for political emancipation within the domestic sphere, provide and complement for the precarity resulting from the agro-industrial model of production, implement various context-specific alternatives for agroecology, illustrate aesthetically their complexity and vivacity, and above all, for the purpose of this research: they operate in a different communication model. Here the agriculturist, the human agent, is not fostering the garden by conventional means of control, engineering and supremacy over every process. Instead, the agriculturist is entangled with the garden, is part of the garden, and provides for its own needs from it in a decentralized, distributed, adaptive manner — as part of an exchange in which the human agent is part of a system that allows plants to thrive in diversity and harvesting is merely a part of that process.

As in *gambiarra*, the above mentioned examples of neotropical small scale food production systems are open systems in which humans respond processually in favor of the circumstances and not of a predetermined rigid architecture. Both phenomena illustrate a very special human-environment relationship and concomitantly an extraordinary attitude towards design, in which humans provide for their needs and solve their problems not by taking control over situations and designing from scratch from a individualistic human-centered approach, but they become part of the systems they are trying to interfere in and benefit from. Human design in such a context regards actions that will allow systems to progress through the increase of complexity and diversity, unfolding a life of their own beyond human hands. Creole and *quilombola* horticulture represents a dialogical, responsible and sustainable human environment creative relationship, able to provide for various human needs in a non-technocratic model for design and communication.

## 4. Human-Environment Communication: Politics of Responsibility

A recent study on domestication in food production systems in the neotropics compiles a non-exhaustive list of fifteen definitions of domestication written by archaeologists, geneticists and other students of domestication since the turn of the millennium (Clement et al. 2021). It shows the many nuances of the term in order to deconstruct the standard narrative, popularized by J.C. Scott, that human domestication of plants and animals established agricultural systems that resulted in the emergence of social hierarchy, urban development, and eventually, the arising of states. The study argues that many examples of domesticated landscapes in South America, present much earlier than the reliance on food production and still today, prove that agriculture is not central to social systems and “domestication should not be analyzed from a purely anthropocentric perspective, since it is a co-evolutionary interaction between social and natural systems, and it influences the structure and dynamics of both” (ibid., 3).

Further, the study states that the way we interpret simple phrases about domestication is influenced by our grammar, leading us to assume that either individuals or the human collective are in control, in a position of authority. However, modern concepts and comprehensive definitions of domestication can reveal subtleties in our understanding that recognize the relationship between human culture and the environment, as is commonly seen in many Neotropical ontologies. “In Neotropical ontologies, [...] non-human agency is more than mere adaptation to culturally constructed niches; non-humans are active subjects of landscape transformations, and humans must negotiate with them for these entanglements to satisfy all members of the niche” (ibid., 3).

Care represents one of the three pillars defining plant domestication, presented as a coevolutionary process in which humans are involved but not necessarily the central agency (Rindos 1984). Human management strategies are tailored to fulfill the requirements of plants, which exhibit agency in responding to this attentive care. In small-scale horticultural gardening, domestication is part of a process that treats plants as individuals, whereas in agriculture, they are treated as groups or populations. The significance of this observation lies in its relation to selection and, moreover, the response to selection in the human-environment communication model. The anecdote of gardeners that talk to their plants and develop their own means to listen back is a common example of the link between care and domestication that relies on attunement to feedback, rather than a predominance of a human program.

Similarly, the relation between care and repair is also linked by responses from material and environmental circumstances, and the agency of objects. *Gambiarra* pushes that entanglement further, presenting an ability to respond to circumstances, a liminal *modus operandi* and at the same time the rejection of a method: an always singular emergent behavior in an open network that is truly creative in all its negentropy.

The notion of *response-ability* as formulated by Maria Puig de la Bellacasa and Donna Haraway emphasizes the importance of recognizing and responding to the entangled relations between humans and non-humans in the context of care. Care involves an ability to respond in ways that are situated and context-dependent, acknowledging the agency and autonomy of non-human entities and describing care as “a practice of sensitivity and responsiveness to the needs and rhythms of other bodies” (Puig de la Bellacasa 2017, 25). She emphasizes that care involves a continual process of sensing and responding to feedback, adjusting one’s actions and intentions based on the signals that other bodies are sending. Latour takes this environmental dispatch further affirming that environmental factors now impose many types of answers, making its agency loud and clear (Latour 2017).

Haraway and Puig de la Bellacasa both emphasize the importance of feedback loops in the practice of care. For Haraway, care involves creating ongoing practices of observation, interpretation, response, and correction (Haraway 2016, 33). Similarly, Puig de la Bellacasa views care as a deeply relational practice that involves ongoing responsiveness and adaptation to changing circumstances and environments. Both authors highlight the need to constantly tune into the feedback signals that the environment and its inhabitants are sending and make adjustments accordingly. This kind of responsiveness is central to the notion of *response-ability*, suggesting that care and *response-ability* are closely related.

In the field of Communicology, Vilém Flusser proposes that responsibility involves being open to possible feedback and allowing the system to be receptive to others. Responsibility means granting the receptor the ability to respond, creating an obligation for the author to respond in return. The difference between authority and tyranny is rooted in the receptor’s acceptance of the author as an emitter. Authority is never imposed, but rather granted by the receptor to the author. Conversely, tyranny occurs when the author forces their position onto the receptor, resulting in extreme irresponsibility towards the receptor’s inability to respond. When no feedback is allowed, the receptor becomes unresponsive and the author becomes irresponsible towards the receptor. Authority is established when receivers accept an author, and responsibility is demonstrated when messages are systematically responsive. This is possible through am-

bivalence, meaning that the intellectual is responsible when leaving room for interpretability and openness to dialogue with other systems (Flusser n.d.).

Responsibility is also a crucial element in Flusser's ontology, which takes place upon the enmeshing of an intersubjective fabric. In his oeuvre, responsibility is synonymous to engagement (in Portuguese, *engajamento*) and evokes a reality that can only be manifested through encounter — the act of realizing oneself through another. We are not subjects acting in relation to objects, we do not find ourselves by navigating an objective world, but we shape our notion of “self” in response to others. Thus, being responsible is the promptness to respond to this confrontation and acknowledge oneself as unrestrained (Winkler 2016).

Although Flusser's concept of responsibility primarily pertains to critique and its role in science, it invokes a dialogue that extends to social, material, and environmental circumstances. This dialogue facilitates access to modes of being that emerge from continuous encounter and prompt answerability, de-alienating and disrupting linearity. Flusser's notion of responsibility is anti-technocrat, as, according to him, the responsible is the antagonist of the technocrat, since every engagement results, if successful, not in the realization of a model but in its distortion.

The ambivalence necessary for responsibility in a flusserian cosmos is comparable to *gambiarra's* paradoxal openness. Sustainable yet wasteful, clever yet shortsighted, restorative yet amoral — *gambiarra* carelessly takes care. Michel Serres's *parasite* offers a framework for the undecidability of *gambiarra* and the complex systems that cross its strange loops. The Parasite formulates an information theory that examines how new information is created through reversal, interdependency, and appropriation. Through a lyrical study, it describes how undecidable identities cannot be simplified and implicate paralogics. Information and noise play interchangeable roles and create increasingly complex loops. Serres views noise as a sign of an increase in complexity. For those who can bear neither ambiguity nor uncertainty, such noise must be eliminated; for those daring a more complex operation, however, noise is a welcome guest whose interruptions and disruptions are as creative as they are destructive.

In “The Parasite”, a world is portrayed in which subjects are multiple and non-dualistic, embodied by characters such as farm rats, city rats, the farmer (who turns out to be a tax farmer, living from the production of other farmers). The roles of host, guest, hospitable, and hostile constantly exchange, blurring the lines between them. The parasite is not a static entity, but rather an operation, which challenges binary thinking and opens up a shift in interpretation. The parasite is a joker — a character that embraces multidimen-

sionality — a relation, a “liaison agent” in dialogue with the material world. It has no *a priori* value established by convention, but in response to circumstances, to the supernatural, to the environment.

In *The Parasite*, ambiguity is formulated as a fundamental theorem, oscillating between information and noise. Similar to *gambiarra*, it values ambivalence as crucial to the emergence of novelty and life. The parasite is akin to a trickster figure, devoid of rigid identity and morality. It disregards waste, form, and exteriority. Instead, it displays the dynamism of systems, boundaries and negotiations. Additionally, it celebrates characters often burdened with negative connotations by exposing their true generative potential.

*Gambiarra* is a practical illustration of Serres’ noise-information relationship, in which noise and information are interconnected and inseparable. Noise and information are not opposite or distinct categories, but rather two sides of the same coin. In this view, noise is a necessary element for the production and transmission of information, as it provides unpredictability and creativity to the system. While noise can be disruptive and chaotic, it can also be generative, producing new forms of information and knowledge. *Gambiarra* emerges from noise and, even if resulting in information, it always remains double antithetical. Paraphrasing J. Hillis Miller definition of *para* for its recontextualization within *gambiarra* “(para) is simultaneously on both sides of the boundary line between inside and out. It is also the boundary itself, the screen, which is a permeable membrane connecting inside and outside. It confuses them with one another, allowing the outside in, making the inside out, dividing them and joining them. It also forms an ambiguous transition between one and the other” (Miller 1979, 219).

Undecidability breeds diversity and complexity, once open complex networks are characterized by recursive and reflexive circuits that continually fold back upon themselves. Strange loops, like those described by Gödel and embraced by Serres, are self-reflexive circuits that appear circular yet paradoxically remain open. These complex adaptive systems exhibit joint recursive circuits between the system and its environment, resulting in unexpected and disproportionate changes. Furthermore, their openness leads to aleatory changes in schemata, creating distinctions between the starting point and the end point. As a result, complex adaptive systems must engage in co-adaptation to adapt to other adapting systems, leading to an increase in complexity as every complex system is integrated into more extensive networks of other complex systems.

Domestication is a less anthropocentric process than assumed through our vocabulary. It entails a notion of care grounded in feedback loops. The importance of feedback loops in the practice of care and responsibility has been highlighted by Flusser, Haraway, and

Puig de la Bellacasa, as it involves ongoing responsiveness and adaptation to changing circumstances and environments. Neotropical small scale food production systems practice a human-environment communication model in which circumstances prevail over a predetermined anthropocentric agricultural design. Similarly, *gambiarra* operates on a design process fundamentally defined by circumstances, embracing noise as necessary for the emergence of novelty and life. Both cases represent an engaged relationship to the environment, opposed to the alienated and entropic hegemonic model for design. Yet, this research argues that both still refer to design: more-than-human design that is anti-technocratic as it does not perpetuate models but evolves in constant reform.

## 5. Conclusion

The current state of affairs makes evident the need to move beyond present forms of human-environment relationships, and this research framework offers an alternative approach that supports the engagement with more adaptive and responsive connections with the environment. This shift is necessary to avoid relying solely on technological solutions that reinforce the prevailing modes of living. Such *technological fixes* are bound to naturalist understanding of the environment that suffers from anthropocentrism and tends to ignore circumstances in favor of a rather rigid world-view that has its genealogy linked to the formation of the Global North. This mentality populates environmental activism, regulation and policy-making, resulting in perpetual “Western-centric” decision making related to earthly crises.

Likewise, design is a mostly uncontested practice that display similar supremacist values. It represents a holy place for technocracy and human intelligence that *gambiarra* provokes and perverts. *Gambiarra* also proves that repair can be part of a design process that transcends human intelligence, as part of a complex adaptive system. Additionally, *gambiarra* illustrates the noise-information paralogic as describe by Serres, resignifying its contradictory and paradoxal features.

Examples of neotropical small-scale food production systems redefine domestication decentralizing human agency and showing empowering possibilities in domesticity. Its co-constitution reveals a communication model similar to *gambiarra* that allows to reconfigure a politics of responsibility structured in ambivalence and engagement. In the context of generative and media arts, this research invites the reader to think of technology beyond technocratic terms, enduring in the aesthetical, technical and critical discomfort of *gambiarra* in order to expand narratives on more-than-human intelligence, developing embodied material-discursive strategies for such.



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