10.35362/issn.1850-0013-1243

When Extended Peer Communities are not Feasible. "Bounded Science with Local People" and Knowledge Production in Violent Territories *

Cuando las comunidades ampliadas de pares no son viables. "Ciencia delimitada con gente local" y producción de conocimiento en territorios violentos

Quando comunidades ampliadas de pares não são viáveis. "Ciência restrita com pessoas locais" e produção de conhecimento em territórios violentos

Enrique García Becerra , Jesús Rodríguez Rodríguez y Jaime Paneque-Gálvez **

Post-Normal Science (PNS) is operationalized through Extended Peer Communities (EPCs), which guarantee knowledge quality, legitimacy and policy relevance through participation and public deliberation of stakeholders with interest in a complex problem. Yet the minimum conditions that EPCs require—like trust, safety or freedom of speech—may be absent in violent territories under criminal control. Considering such contexts, in this article we ask whether research inspired by PNS can be operationalized where EPCs are not feasible due to the unacceptable risks that they would bear onto participants; in addition, we reflect on what forms of participatory knowledge production are possible when EPCs cannot be established and ask whether they would qualify as PNS. To address these questions, we conducted a case study in Chulavista, a large-scale low-income housing development in the peri-urban fringe of Guadalajara (Mexico), which is affected by housing abandonment, criminal governance and violence. Given the safety constraints found, we adapted our methodological strategy and developed a bounded form of "science with the people" that incorporated extended facts but involved no plural deliberation nor extended peer review. We discuss its ethical implications, present our main contributions, and argue that whether such arrangements count as PNS remains an open question.

Keywords: *adaptive methodologies; housing abandonment; peri-urban areas; post-normal science; violence*

* Recepción del artículo: 27/06/2026. Entrega del dictamen: 07/10/2026. Recepción del artículo final: 16/11/2026.
** *Enrique García Becerra:* Centro Universitario de Arte, Arquitectura y Diseño (CUAAD), Universidad de Guadalajara, México. Correo electrónico: enrique.gbecerra@academicos.udg.mx. ORCID: https://orcid.org/0000-0001-5829-9285. *Jesús Rodríguez Rodríguez:* Centro Universitario de la Costa, Universidad de Guadalajara, México. Correo electrónico: jesus.rrodriguez@academicos.udg.mx. ORCID: https://orcid.org/0009-0002-6706-8723. *Jaime Paneque-Gálvez:* Centro de Investigaciones en Geografía Ambiental, Universidad Nacional Autónoma de México. Autor de correspondencia. Correo electrónico: jpanequegalvez@ciga.unam.mx. ORCID: https://orcid.org/0000-0002-9926-2742.

La ciencia posnormal (PNS, por sus siglas en inglés) opera mediante comunidades ampliadas de pares (EPC, por sus siglas en inglés) que garantizan calidad del conocimiento, legitimidad y relevancia política gracias a la participación y deliberación pública de las partes interesadas en un problema complejo. Sin embargo, las condiciones mínimas que requieren las EPC —como confianza, seguridad o libertad de expresión— pueden estar ausentes en territorios violentos bajo control criminal. Considerando estos contextos, nos preguntamos si la investigación inspirada en la PNS puede llevarse a la práctica donde las EPC no son viables, debido a que generaría riesgos inaceptables para los participantes; además, reflexionamos sobre qué formas de producción participativa de conocimiento son posibles cuando no se pueden establecer las EPC y nos preguntamos si estas formas podrían considerarse PNS. Para abordar estas cuestiones, realizamos un estudio de caso en Chulavista, un complejo habitacional a gran escala situado en la periferia de Guadalajara (México), que se ve muy afectado por el abandono de viviendas, la gobernanza criminal y la violencia. Dadas las limitaciones de seguridad detectadas, adaptamos nuestra estrategia metodológica y desarrollamos una forma limitada de "ciencia con la gente" que incorporaba hechos ampliados, pero que no implicaba deliberación plural ni revisión ampliada de pares. Analizamos sus implicaciones éticas, presentamos nuestras principales contribuciones y sostenemos que si este tipo de acuerdos pueden considerarse PNS sigue siendo una cuestión abierta.

Palabras clave: abandono habitacional; áreas periurbanas; ciencia posnormal; metodologías adaptativas; violencia

A ciência pós-normal (PNS, sigla em inglês) é colocada em prática por meio de comunidades ampliadas de pares (EPC, sigla em inglês), que garantem a qualidade do conhecimento, a legitimidade e a relevância política graças à participação e à deliberação pública das partes interessadas em um problema complexo. No entanto, as condições mínimas exigidas pelas EPC —como confiança, segurança ou liberdade de expressão— podem estar ausentes em territórios violentos sob controle criminoso. Considerando esses contextos, questionamos se a pesquisa inspirada na PNS pode ser colocada em prática onde as EPC não são viáveis, uma vez que gerariam riscos inaceitáveis para os participantes; além disso, refletimos sobre quais formas de produção participativa de conhecimento são possíveis quando não é possível estabelecer as EPC e nos perguntamos se essas formas poderiam ser consideradas PNS. Para abordar essas questões, realizamos um estudo de caso em Chulavista, um complexo habitacional de grande escala localizado na periferia de Guadalajara (México), que é fortemente afetado pelo abandono de moradias, pela governança criminosa e pela violência. Dadas as limitações de segurança detectadas, adaptamos nossa estratégia metodológica e desenvolvemos uma forma restrita de "ciência com as pessoas" que incorporava fatos ampliados, mas que não envolvia deliberação plural nem revisão ampliada por pares. Analisamos suas implicações éticas, apresentamos nossas principais contribuições e defendemos que ainda é uma questão em aberto se esse tipo de acordo pode ser considerado PNS.

Palavras-chave: abandono habitacional; áreas periurbanas; ciência pós-normal; metodologias adaptativas; violência

Introduction

Post-Normal Science (PNS) emerged as an alternative scientific approach to deal with complex socioenvironmental problems which required urgent decisions that, nonetheless, had high levels of uncertainty and involved different stakeholders with conflicting values and high stakes on the issue at hand (Funtowicz & Ravetz, 1993). The proponents of PNS argued that, in such situations, neither applied science nor professional consultancy were effective for producing appropriate knowledge to support decision-making. At the core of their proposal was the creation of "Extended Peer Communities" (EPCs), "consisting not merely of persons with some form or other of institutional accreditation, but rather of all those with a desire to participate in the resolution of the issue" (Funtowicz & Ravetz, 2003, p. 7). In addition to providing "extended facts" (e.g., knowledge they already possess or can produce regarding the problem under investigation), EPCs are key to ensuring knowledge quality, legitimacy and policy relevance; therefore, adopting a PNS lens is coupled with the idea of forming an EPC, which means that the production and use of expert knowledge become subject to broader forms of social scrutiny and public deliberation (Funtowicz & Ravetz, 2000).

If EPCs are a fundamental condition for "doing PNS", one may ask: What happens when creating EPCs is not feasible, for example because it is too risky for people to participate in public deliberation processes in contexts traversed by extreme violence, or because there is no social trust in public policies and decision-making processes owing to widespread corruption from local civil servants and politicians? Questions of this sort have been barely explored so far in the PNS literature, perhaps because its geographic origin and most of its development have taken place in the global North. Nevertheless, there are several recent efforts —including some from researchers based in the global South— which have sought to assess the potential limitations of PNS in contexts marked by weak institutional legitimacy, high corruption, crime, violence and power asymmetries among stakeholders (Turnpenny *et al*., 2011; Giatti, 2019; Orozco-Meléndez *et al*., 2024; García Becerra & Rodríguez Rodríguez, 2025). One major limitation that has been identified in such contexts, at least in cases where particularly adverse conditions exist, is precisely that forming EPCs may be unfeasible (Orozco-Meléndez *et al*., 2024). Consequently, it is advisable to be cautious and not to assume that conventional models of participation and knowledge co-production — as typically suggested or adopted by PNS scholars— can be implemented anywhere (Orozco-Meléndez *et al*., 2024).

Taking into consideration that conducting PNS in certain territories is beset by severe challenges, potentially including unsafe conditions for participants in EPCs, is not to say that we should necessarily discard the adoption of a PNS framework. Rather, such challenges and risks invite us to reconceptualize or reframe what seems possible in every hostile situation as compared to the PNS ideal. For instance, we may think of PNS as a flexible heuristic framework whose concrete forms of implementation will depend upon specific territorial conditions (e.g., political, institutional, criminal) (Farrell, 2011; Strand, 2017; Orozco-Meléndez *et al.*, 2024). As we will argue in this paper, understanding PNS in a more flexible way, when necessary, may imply that it cannot always or solely rely on the emergence and the expected function performed by EPCs as they were originally proposed by Funtowicz and Ravetz (1993). Accordingly,

we suggest that adopting a PNS framework in violent, dangerous territories, where the creation of EPCs would impose unacceptable risks for participants, may instead depend on designing a partial, adaptive and context-sensitive methodological strategy. We posit that adopting scientific practices inspired by the principles of PNS to the extent that is locally feasible, even if that means not forming EPCs for the sake of participants' own safety, does not necessarily undermine the ethos of PNS insofar as we are dealing with post-normal problems, i.e., those where we find the "post-normal mantra", namely: conditions where facts are uncertain, values in dispute, stakes high and decisions urgent (Funtowicz & Ravetz, 1993).

In this article we provide an empirical account to examine our initial argument on the need to tailor a PNS framework so that it fits with very harsh local conditions. We draw on a doctoral study conducted by the first author in Chulavista, a large-scale low-income housing development located in the municipality of Tlajomulco de Zúñiga, on the peri-urban fringe of the Guadalajara Metropolitan Area, Mexico. Specifically, we examine a participatory process of territorial knowledge production that we developed to identify and classify abandoned houses in Chulavista, which could be useful for revealing how criminal governance and violence may underpin, to a certain extent, the housing abandonment crisis in Mexico and the problems it entails. A feature of particular interest to analyze this phenomenon in Mexico is that peri-urban housing developments of this type, which cater for low-income people, are characterized by intense socio-spatial segregation and high levels of crime and violence. This means that conducting research in these places is usually unsafe as it poses significant risks to researchers and participants. Given such constraints, and in light of what is normally expected from a PNS lens, we ask: can research inspired by PNS be carried out in dangerous territories where EPCs cannot be established without exposing participants to unacceptable risks? In other words: what forms of participatory knowledge production and methodological strategies can be developed in violent (peri-)urban territories where the conditions required to establish an EPC are absent?

Both questions are especially relevant in Mexico given the ubiquitous presence of organized crime groups, the extreme violence they perform to exert territorial control and ensure their operations, as well as the quasi-total impunity they benefit from (Valencia, 2016; Blazquez & Le Cour Grandmaison, 2021; Lomnitz, 2023). Such groups are no longer confined to remote rural areas, but increasingly operate from urban centers, often from housing developments located in their peripheries. This trend has likely been exacerbated, at least to a certain extent, by the rapid growth of peri-urban areas associated with neoliberal housing policies (Monkkonen, 2019; Paquette-Vassalli *et al*., 2025).

Chulavista provides an appropriate case study to address the questions that underpin the argument on which we reflect in this paper. On the one hand, according to the INEGI 2020 census 3,398 of the 14,615 houses in Chulavista were inhabited (i.e., 23.3%); furthermore, the Tlajomulco de Zúñiga municipality had 77,709 vacant houses, i.e., the

largest number in the state of Jalisco[1] (IIEG, 2020; INEGI, 2020). On the other hand, Chulavista is regarded as an insecure and potentially dangerous place by most residents and the authorities. For instance, the municipal C4 system[2] had records of 69 homicide reports in Chulavista over the 2019–2022 period (Ayuntamiento de Tlajomulco de Zúñiga, 2023, p. 2); yet the real figure is likely to be much higher as many homicides associated with organized crime in Mexico go unreported because of fears of reprisals.

As the reader will probably grasp, the absence of adequate safety conditions in Chulavista made it extremely difficult to attempt establishing an EPC to collectively study and seek solutions to the housing abandonment problem. In addition, many years of political neglect of the multiple everyday problems that the residents of Chulavista must endure have made them very distrustful of politicians and decisionmakers. This fact added another thick layer of complexity to our initial wish of creating an EPC. Within this narrow window to operationalize the study, the first author resorted to developing a limited form of participation from a group of seven resident women who were keen on collecting data on the status of houses across Chulavista in exchange for a weekly payment.

In this paper we analyze the participatory, adaptive and context-sensitive methodological strategy designed and implemented in the field as well as what it means for scholars who wish to adopt a PNS framework in contexts where violence may make EPCs unfeasible or undesirable on the basis of unacceptable risks to participants. In addition, we examine the results that this methodological approach produced in relation to the housing abandonment problem under investigation. Three main contributions stem from our study: 1) methodologically, we show how an initial, "ideal" research design can be adapted to better address unsafe local conditions so that it does not add further risks to participants and researchers; 2) theoretically, we reflect on what remains of the "science with the people" ideal when EPCs cannot be created and what possibilities exist to embrace the PNS philosophy in extreme situations such as those described in our study; and 3) empirically, we document the extent of the housing abandonment problem in Chulavista and classify the current state of the houses across the 19 phases of this large peri-urban development.

The article is organized as follows: Section 1 provides a brief review of debates on PNS, EPCs, (peri-)urban violence and housing abandonment in Mexico. Section 2 presents the case study, the adaptive methodology designed and put forward, and some ethical considerations. Section 3 reports on the housing abandonment inventory carried out and the methodological benefits and limitations encountered. In Section 4 we discuss our results in connection with the contributions mentioned in the previous paragraph. Finally, we provide some conclusions regarding our contributions and suggestions for future research on this topic.

[1] Guadalajara is Jalisco's capital.

[2] The C4 system is a key component of municipal security and emergency attention in Mexico. Its acronym stands for *Centro de Control, Comando, Comunicación y Cómputo* (Center for Control, Command, Communication and Computation).

1. Theoretical background

1.1. Post-normal science and operational constraints in violent contexts

PNS proposes expanding the processes of knowledge production, assessment and validation to tackle a post-normal problem. To that end, PNS has an epistemological-normative orientation that can be termed "science with the people", which implies both a democratization of science for problem resolution and an epistemological extension (Funtowicz & Ravetz, 2000). To operationalize such an orientation PNS seeks to bring together the different social actors that are affected by a specific problem and create an EPC. In that sense, EPCs are spaces where different types of knowledge converge —e.g., scientific, technical, institutional, contextual, experiential— and can lead to a better understanding and management of a complex problem.

Although PNS was originally conceived as an approach to better address complex problems that implied the existence of conflicts, it has generally been adopted in cases where conditions were relatively favorable for open participation, deliberation and exchange of ideas among social actors —i.e., for establishing effective EPCs (Turnpenny *et al*., 2011; Funtowicz & Ravetz, 2025). Recent scholarship on PNS, however, has shown that the formation of EPCs may depend on social, institutional and techno-scientific conditions that are not necessarily present in many geographic contexts across the global South (Orozco-Meléndez *et al*., 2024). Of particular relevance in that sense are locations where governmental institutions lack social legitimacy because of high levels of corruption and power abuse. That means that ordinary citizens are very unlikely to engage in deliberative processes with government officials due to distrust and significant risks of tokenistic participation. Another factor that severely hinders social participation is violence. When lay people live in places where speaking out publicly on controversial issues may threaten their lives, the idea of engaging in EPCs seems very unrealistic.

We argue that wherever such limitations exist, the central question regarding participation and public deliberation should shift: rather than asking ourselves how they should be fostered or expanded to adhere to the PNS ethos, we should carefully consider whether asking people to participate in the investigation and solution of a post-normal problem is feasible and ethically justifiable. In this article we thereby assess the feasibility of forming EPCs both as a practical and ethical question. Following Orozco-Meléndez *et al*. (2024), we argue that trust, institutional relationships and opportunities for disagreements among participants must be evaluated beforehand in cases where unfavorable conditions for safe EPCs exist. In such cases, therefore, the main problem that must be considered is people's safety.

1.2. Urban violence and knowledge production in Mexico

The geography of organized crime and associated violence in Mexico has been deeply reconfigured since the early 2000s. Most studies and press news focusing on this phenomenon have been concerned with the increasing spectacularization of violence and the unbearable death and disappearance toll that has characterized it, particularly

once the so-called “war against narco” was launched by President Felipe Calderón in 2006 (Valencia, 2016). Far less attention has received the analysis of how these war-like conditions affect the everyday lives of ordinary citizens, particularly in cities, for example on shaping their mobility and their interactions with people outside their inner circle (Durán-Martínez, 2018; Trejo & Ley, 2020; Blazquez & Le Cour Grandmaison, 2021; Blazquez, 2025). Nevertheless, the rapid territorial expansion of a growing number of criminal groups, the diversification of their operations, their leverage among many young people, and the uneven capacity of the State to deal with this crisis —to name a few factors— have produced contexts in which violence operates through everyday mechanisms such us informal surveillance, bribery, extortion, forced displacement, control of economic activities and appropriation of space (Lessing, 2021; Lomnitz, 2023).

Peri-urban territories are particularly relevant to understanding the dynamics of organized crime. Several scholars have shown how peri-urban precarity, weak institutional presence and a limited provision of basic public services are conducive to the establishment of hybrid forms of governance in which public officials, residents and criminals interact in complex ways (Arias, 2017; Duarte Villa *et al*., 2021; Lessing, 2021). Under such circumstances, the residents of informal settlements and low-income housing developments in the peripheries of cities must adjust to conform to the tacit rules imposed by criminal governance. In practice this regime affects everyday life in realms like economic activity, mobility, use of public space, relationships or safety measures, to name a few. Consequently, walking off their usual paths, taking photographs, journaling, or talking to unfamiliar people may acquire meanings and elicit risks quite differently than in safer urban environments. Voluntary participation in research activities or public deliberation processes is therefore very difficult for residents of this type of peri-urban territories as it may impose onto them an extra layer of insecurity.

Conditions for doing social research based on fieldwork in peri-urban territories in Mexico pose significant challenges for researchers as well. Several studies undertaken in Latin America have shown that violence is not just an additional feature of the place in which research is conducted, but an active condition that shapes the feasibility of access, observation, social interaction and knowledge (co-)production (Rodgers, 2004; Goldstein, 2012; Baird, 2018; Blazquez, 2025). Under these conditions, researchers must continuously negotiate issues like trust, dialogue, mobility, protection and safety both for them and their territorial allies. Researching in violent places thus entails adapting conventional methods and ethical protocols to fit what is possible without incurring further risks. From a PNS perspective this issue is especially problematic as it may question its foundational principles and how they are operationalized with EPCs through open participation and public deliberation among all relevant stakeholders (Orozco-Meléndez *et al*., 2024). In these contexts, it may well be unfeasible to increase participation or simply unacceptable to promote it given the risks it may carry. Is it then impossible to adopt a PNS framework in violent territories such as those that are sadly so widespread in Mexico and elsewhere in Latin America?

1.3. Peri-urban development, housing abandonment, and territorial deterioration

Housing abandonment in Mexico is closely connected to the urban expansion dynamics associated with the mass production of social housing from the late 1990s (Paquette-Vassalli *et al*., 2025). Factors like subsidies for mortgage financing, the opening of housing markets to large private developers and neoliberal public policies geared toward maximizing the number of houses built boosted the construction of large-scale low-quality developments in peri-urban areas that lacked appropriate access, infrastructure and basic services (Villar Calvo & Méndez Ramírez, 2014; Monkkonen, 2019). Although this housing model led to a relative decrease in the quantitative deficit that existed in the country, greater opportunities for buying low-quality housing in peri-urban areas did not guarantee access to the city (Rodríguez & Sugranyes, 2005).

The adverse social consequences of this model became apparent only a few years after large-scale low-income housing developments were first occupied. Long commuting times, high costs of mobility, insufficient or non-existent public services, limited economic opportunities and deterioration of infrastructure and housing led to the rapid abandonment of many dwellings across the country (Harner *et al*., 2017; Monkkonen, 2019). Many vacant houses were vandalized, informally occupied or used by organized crime for illicit activities, subsequently. At the same time, urban physical decay weakened residents' networks and intensified their perception of insecurity (Holguín Ávila & Maycotte Pansza, 2024; Paquette-Vassalli *et al*., 2025). Housing abandonment dynamics have thus deepened peri-urban vulnerability which, in turn, has led to more abandonment.

The Mexican case is outstanding owing to the scale of the phenomenon, the speed of urban expansion, and the interaction between urban precariousness, insecurity and violence (Reyes, 2021; González-Ochoa, 2023; Paquette-Vassalli *et al*., 2025). Vacant houses may thus be interpreted as visible footprints resulting from urban exclusion, peri-urban disinvestment, territorial stigmatization and conflict (Wacquant, 2007), which makes housing abandonment a relevant and timely post-normal problem well suited to explore the epistemological and methodological challenges that arise when we aspire to adopt a PNS framework.

1.4. Science with the people and participatory territorial knowledge production

Given the hostile conditions described here for the case of many peri-urban settings across Mexico, we claim that PNS' "science with the people" provides a more useful point of departure than EPCs; as the former is an epistemological and normative orientation rather than a specific mechanism to put it into practice, it should be possible to adapt it to context-specific participatory arrangements with residents to minimize the risks identified for a particular settlement. In that way, for instance, people who are affected by a problem could help record observable conditions and interpret local processes even if public deliberation cannot be safely convened. Such participatory territorial knowledge production, however, does not necessarily translate into representative or fair participation, symmetrical relationships between researchers and participants, or the greater quality of knowledge produced by EPCs that PNS aims to achieve.

In **Table 1** we summarize some dimensions that are relevant to PNS and compare them between different scientific approaches including ours in this study, which we may call "bounded science with local people". For Funtowicz and Ravetz (1993), PNS implies not just an extended community of peers —who share an interest in a given problem and work alongside to assess knowledge quality—, but also "extended facts", defined as other types of knowledge —e.g., experiential, spatial— that would not be included as evidence in normal science. Bidwell (2009) has shown that community-based participatory research is not inherently PNS; rather, it may become so when deliberation about data, analysis and subsequent action is open to a wider spectrum of interested people. These distinctions enable us to more accurately frame the participation that we could achieve in our study. We could incorporate into knowledge production some extended facts from seven participants, yet they did not participate in problem-framing, nor did they assess the quality of the knowledge ultimately produced by the academic team. Consequently, the approach we could implement is certainly different from an EPC and from a study based on key informants or focus groups.

Table 1. Different scientific approaches and outputs across several dimensions relevant to PNS

Dimension	Normal science	Key informants / Focus groups	PNS with an EPC	Bounded science with local people (this study)
Who produces knowledge	Accredited experts	Researchers, drawing on participants' accounts	Experts together with all with a stake in the problem	Academic team; resident women collected data in the field, thus producing the inventory map
Role of non-academic participants	Research subjects or data sources	Informants whose views are elicited and interpreted by researchers alone	Extended peers who contribute extended facts and assess the quality of knowledge	Paid field collaborators whose territorial roots and ties as local residents made data collection possible
Research design and categories	Defined by experts	Defined by researchers	Negotiated among participants	Defined by the academic team
Deliberation	Within disciplinary communities	Moderated discussion within the researchers' agenda	Open and plural, including values and stakes	Limited discussions during trainings and map collection

Quality assurance	Scientific peer review	Researchers' interpretation	Extended peer review	Academic team's criteria and validation, informed by participants' local knowledge
Conditions assumed	Institutional autonomy of science	Safe meeting spaces and recruitable participants	Safety, trust, legitimacy and open spaces for deliberation	Pre-existing networks of trust, residents' ability to move without drawing attention
Relation to decision-making	Not the primary goal. Expert advice to policy if requested	Not the primary goal. Expert advice to policy if requested	A primary goal. Deliberation informs and legitimizes decisions	An important goal but not achieved. Inventory results and expert advice were provided to SEDATU though they had not been requested

Source: own elaboration based on Funtowicz and Ravetz (1993), Bidwell (2009) and Orozco-Meléndez *et al.* (2024).

2. Case study and methodological strategy

2.1. The territorial context of Chulavista

Construction of Chulavista began in the late 1990s in the municipality of Tlajomulco de Zúñiga, which is in the southern peri-urban fringe of the Guadalajara Metropolitan Area (**Figure 1**). This housing development exemplifies the neoliberal model of peri-urban real estate development described earlier, which typically occupies agricultural land far from the city center (**Figure 2**). Chulavista was conceived as an affordable development for working-class families and was built in 19 phases, as shown in **Figure 3**. Over the years, however, it has become an emblematic case of housing abandonment in Guadalajara (Hernández Villalvazo, 2017). Following the five rationales proposed by Yin (2009) for single-case studies, Chulavista represents a "revelatory case" because it offers an opportunity to study a phenomenon that is largely inaccessible to conventional fieldwork; indeed, this abandonment and the progressive deterioration of the built infrastructure are largely linked to the criminal governance prevalent in these peri-urban areas, which in turn shapes both the daily lives of residents and what it is feasible to investigate about the phenomenon through fieldwork.

2.2. Restricted access and violence in Chulavista

The prevailing sense of insecurity in Chulavista reshaped the research from our very first visits. This is with good reason: those who do not live in this housing development

easily arouse suspicion. Residents, for their part, may feel as though they are being watched when they walk outside the phase where they live or the phases they must pass through on their daily commutes: "You can even feel like you're being watched, as if they were saying, 'She's not from here, what is she doing here?'" (Interview 1, September 2024).

Several residents warned us from the outset that walking around Chulavista and gathering information in plain sight was dangerous due to the presence of organized crime. This is how we learned that several families had been evicted from their homes by a criminal group so that some of its members could occupy them while they operated in the area. During one of our initial meetings with residents, a heavily armed man offered to accompany us so we could gather information on the condition of the homes, assuring us that "as long as we went with him, nothing bad would happen to us"; this situation demonstrated firsthand how access to Chulavista is informally regulated by armed actors. Another resident pointed out the existence of a house where a clandestine grave had been found. This coincides with information from official sources. In addition to the homicide reports cited in the introduction, the municipal C4 recorded 13 reports of human remains and seven femicides in Chulavista between January 2019 and March 2023 (Ayuntamiento de Tlajomulco de Zúñiga, n/d); the state's geolocated crime records for Chulavista contain 2,860 entries between 2017 and April 2024, of which 158 are intentional homicides (IIEG, 2024); furthermore, Tlajomulco de Zúñiga accounts for 793 of the 1,968 records corresponding to the clandestine graves discovered in Jalisco during the 2018–2023 period; c. 40% of all the records in the state are concentrated in this municipality, which flags it as particularly violent (Gobierno de México, n/d). It should be noted that both the presence of clandestine graves and the public display of corpses serve as territorial markers of a criminal group's violence; in Mexico and Central America, these two elements are the signs most likely to lead researchers to judge a site insecure and, consequently, to abandon their fieldwork (Wladyka & Yaworsky, 2017).

Our initial assessment of the conditions for conducting fieldwork in Chulavista led us to rule out the possibility of establishing an EPC, as the risks involved for participants seemed unacceptable to us. Had we issued an open call, publicized it through posters, door-to-door visits, or local social media, and then held public meetings to discuss the housing problem in Chulavista, this would have fully brought the issue analyzed in our research to light while simultaneously exposing participants to the criminal actors who control this peri-urban territory. At the same time, involving government officials posed a different obstacle: residents deeply distrust local authorities, and in their presence, they either withhold information or take the opportunity to complain and express their frustration over the government's lack of attention to the situation they are facing. Some of the people we interviewed expressed their dissatisfaction with the authorities' response, recalling instances in which police patrols had arrived hours late after criminal acts (e.g., burglaries of homes or businesses, muggings, or murders), and instances in which police officers visited drug sales points to collect money from criminals (interviews 2 and 3, September 2024). For all these reasons, we decided it would be unethical to attempt to establish an EPC in Chulavista.

2.3. Adaptive methodological design: "Bounded science with local people"

Our initial methodological design changed owing to the limitations we encountered in Chulavista and was adapted to what residents and their support networks considered feasible for conducting the housing inventory. While we sought to maintain the epistemological-normative aspiration of doing "science with the people" (Funtowicz & Ravetz, 2000; Funtowicz & Hidalgo, 2024), we abandoned the original goal of catalyzing broad deliberation or co-producing knowledge in a representative manner among all stakeholders involved in the issue. Ultimately, we established something akin to "bounded science with local people," in which a group of women participated voluntarily in participatory mapping to help us identify and classify the condition of the homes in Chulavista. All these women received monetary compensation for their fieldwork. Furthermore, as we will see at the end of this section, we employed several more conventional methods to contextualize the inventory and contrast the women's accounts with those of other residents.

Seven women residents, aged 40 to 55, participated in this way; they had lived in the neighborhood for at least seven years and were primarily engaged in unpaid domestic work. The first author, who, like the rest of the academic team, was not from Chulavista, had known one of the seven women for about eight years through their shared involvement in community organizing activities carried out for a political party. In February 2023, after an initial training session, this first collaborator conducted the housing inventory in the phase where she lived. Upon the joint delivery and review of this first map, the woman proposed involving six other women who had expressed interest in participating in the project and were keen on the economic compensation. Thus, a group of seven women was formed based on an existing network of trust and mutual support. As such, this group did not emerge with the aim of being a representative sample of stakeholders with a stake in the issue under study; furthermore, the perspectives of this small group of participants represent the limits of the "extended facts" incorporated into the study, which defined the scope of our methodological strategy. The group's composition excluded men, which was something not planned by the academic team either, but a request by the women themselves on the premise that adult men attract much more attention in areas where organized crime operates, especially those who are strangers.

The academic team independently defined the categories for the condition of the homes and subsequently trained the seven women at the homes of two of them. Each participant received printed maps of the areas to which they had been assigned. To conduct their surveys, the participants organized themselves independently and walked down each street, marking each house and its category. After collecting the first completed map from a participants' home, the academic team verified what it could through a brief site visit by driving a car and took some photographs to support the mapping inventory. Once all the maps were completed, they were digitized with GIS software.

The assignment of categories regarding the condition of the dwellings was based on what could be observed from the street, i.e., apparent abandonment, bricked-up or damaged doors and windows, signs of vandalism, accumulation of trash, and

temporary construction materials such as wood, cardboard, or sheet metal, indicating informal occupation following abandonment. Three of these categories indicated abandoned houses: in good condition, destroyed or severely vandalized, and boarded up (precisely to prevent vandalism or occupation). A fourth category comprised those houses that had been occupied after being abandoned, which are colloquially referred to as "*casas de paracaidistas*" [literally "skydivers' houses"][3]; in any case, it should be noted that since we were unable to verify the tenure status of the houses, this category must be interpreted with some caution, as it is possible that in some cases they were not occupied but rather lent, rented, or even inhabited by their legitimate owners. A fifth category corresponded to the municipal "*Renta tu casa*" [Rent Your House] program, which operated between 2019 and 2026 to promote the subsidized rental of abandoned homes that were in good condition. The group of women did not modify or question any of these five categories. On the contrary, their deep roots in and familiarity with this area were decisive in correctly assigning the different categories, especially the fourth and fifth. In the case of the fourth category, for example, the houses follow a recurring pattern: fences and high roofs made from scraps of wood, plastic, and tarps; makeshift doors and windows also constructed from these materials; and recycled items or accumulated trash in front of the homes.

In this study, we utilized three additional sources of information from the doctoral dissertation from which this work is derived (García Becerra, 2025), which served to contextualize the inventory and cross-check the accounts of the participating women against the opinions and knowledge of a much larger group of residents: 1) a questionnaire administered individually to 430 adults between May and June 2023, who represent a stratified sample based on the 19 phases of Chulavista; 2) two participatory mapping workshops: one with 54 high school seniors in the neighborhood, which was authorized by the principal and supervised by their teachers (November 2023); another with 15 adult residents organized by a municipal community center (January 2024); and 3) five semi-structured interviews conducted in September–October 2024, which were recorded and transcribed manually; in this case, the first author interviewed four of the seven participating women and one male resident who did not participate in the study. For security reasons, the identities of all participants in the workshops, the questionnaire, and the interviews were always coded and kept anonymous. Participation in all activities was always voluntary and preceded by an explanation of the study's purpose within the context of the doctoral research of the first author.

2.4. Ethical considerations

Conducting the research in Chulavista entailed, first and foremost, a series of ethical considerations. Contrary to what we would have wished, we decided not to conduct the

[3] In Mexico, people who settle in a particular place irregularly, i.e., building their own homes without permission from municipal authorities and managing basic services autonomously, without state support, are known as "*paracaidistas*" [literally "skydivers"]. Although the term is used primarily in relation to the creation of informal settlements, it also applies to the occupation of already-built homes in legally developed areas and, therefore, theoretically in accordance with urban planning criteria.

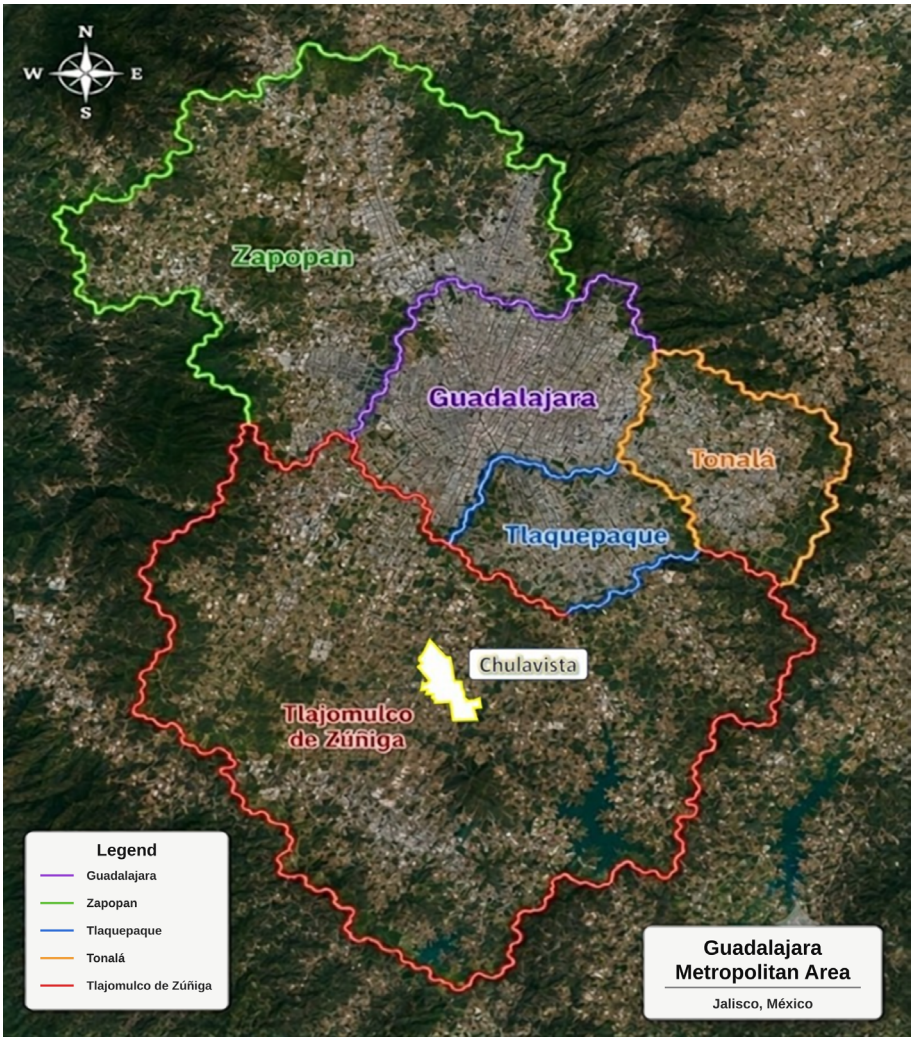
inventory ourselves—neither alone nor in the company of residents—due to the complex security situation prevailing in this neighborhood and the attention our presence would attract. Having secured the support of a female resident known to the first author, and later that of a network of female friends who were also residents, we took great care not to put them at risk under any circumstances. We recognize, in fact, that these women are exposed to chronic risks simply by living in Chulavista, and that the requested fieldwork could create new risks for them (Cronin-Furman & Lake, 2018; Eriksson Baaz & Utas, 2019; Ghosh, 2018; Krause, 2021). Therefore, after understanding the situation in Chulavista, a key goal was to design a methodological strategy in collaboration with the women and, based on their own judgment as long-term residents deeply rooted in the community, to minimize their risks. In this regard, we considered the visibility of the work to be the primary source of risk and agreed with them on a protocol to ensure it went as unnoticed as possible; thus, we agreed that they would not take photographs or ask neighbors about the homes, as these activities could be interpreted as information gathering. They generally walked the streets alone or accompanied by family members, and occasionally by acquaintances who lived in the phase where they were conducting the inventory. They carried out their walks in broad daylight and at times consistent with their daily routines so as not to attract attention. Furthermore, at their own request, no member of the academic team accompanied them so as not to arouse suspicion among other residents and members of organized crime groups.

The participants noted on several occasions that they knew how to take care of themselves and did not perceive any additional risk in conducting the inventory work, since they were well-known neighbors who walked daily through different phases of the development. It is worth clarifying that no woman reported having suffered any kind of threat because of the work performed, and that the academic team asked them every week about safety issues. Some did mention feeling watched during certain walks, but they did not give it much thought since they had not been harassed. All of them worked entirely on a voluntary basis, without receiving any pressure from us. We acknowledge, however, that they had a financial incentive to participate in the work and that the absence of incidents does not in itself prove the absence of risk. Beyond the fieldwork, we agreed with them that we would always maintain their anonymity during and after the study's completion (e.g., when disseminating the results in public forums or at academic events). As we assured them, we have not disclosed their names, places of residence, or connections among them, nor have we shown images of them or any other information that could allow them to be identified. Furthermore, since local networks of trust themselves may be intertwined with armed actors (Eriksson Baaz & Utas, 2019), we have omitted information about the network of women who supported us.

Participation was based solely on a verbal agreement. This agreement covered only the creation of the inventory for as long as it took to complete it, in exchange for a weekly payment given to them every Friday after they submitted their mapping progress. The agreement did not, therefore, include their participation in the dissemination or publication of the results, which would have revealed their identities. For this reason, we consider them participants or collaborators, but not co-researchers. This was not a problem for any of them; on the contrary, several stated that their main motivation for doing the work was financial compensation. Later, one of them remarked that the

work had helped her financially, but that she had not learned anything new and that the inventory had not changed living conditions in the housing development (Interview 1, September 2024). Finally, our methodological proposal did not have to be reviewed by a university ethics committee, since institutional guidelines for conducting fieldwork in contexts of insecurity were limited to a few general recommendations regarding safety.

Figure 1. Main municipalities that make up the Guadalajara Metropolitan Area, Mexico, and the location of Chulavista housing development



Source: own elaboration.

10.35362/issn.1850-0013-1243

Figure 2. Top: Aerial view of several housing developments in the Municipality of Tlajomulco de Zúñiga (Guadalajara Metropolitan Area). Bottom: View of the "Chernobyl" housing development where many apartment buildings were left unfinished and many flats are abandoned



Source: own elaboration.

10.35362/issn.1850-0013-1243

Figure 3. Map of the Chulavista housing development, which consists of 19 phases (Municipality of Tlajomulco de Zúñiga, Guadalajara Metropolitan Area)



Source: own elaboration based on public data provided by the housing developer.

3. Results

The inventory recorded 1,849 houses across the 19 phases of Chulavista: 1,262 vacant (in good condition, destroyed or boarded-up), 530 occupied with unverified tenure, and 57 in the "*Renta tu Casa*" program. Leaving aside these legally rented houses, the total number of abandoned houses oscillates between 1,262 (observed vacancy) and 1,792 (adding occupied houses). Since it was unsafe for the women to verify the tenure status of occupied houses, it was not possible to assess how many of these 530 houses had actually been abandoned and then informally occupied; yet, seeing the façade of most houses within this category, it seems sensible to affirm that a significant proportion of them were not formally rented or lent. Altogether and considering the uncertainty regarding the fourth category, the proportion of abandoned houses in Chulavista ranges between 8.6% and 12.3% of the 14,615 private dwellings registered in 2020 (IIEG, 2020).

3.1. Extent and forms of housing abandonment

The group of women recorded multiple signs of abandonment in all 19 phases, each with between 56 and 183 inventoried houses (see **Table 2**, **Figure 4** and **Figure 5**). What varies is less the presence of abandonment than its form. Occupied houses were the most frequent category (28.7%), followed by destroyed houses (27.1%); the houses in "*Renta tu Casa*" were all in phases 12 to 15 (note, however, that these few formally rented houses were not accounted for in our assessment of house abandonment and are therefore absent from the map shown in **Figure 4**). Occupation was highly concentrated: four phases (13, 5, 11 and 7) contained half of all occupied houses, and in phase 13 two out of three inventoried houses were occupied, whereas almost none were recorded in phases 3, 4, 17 and 19. Boarded-up houses, sealed by owners or neighbors with support from a municipal program that supplies the materials (Interview 3, September 2024), were most frequent in phases 2, 3 and 4. Relative to the dwellings in each phase, inventoried houses ranged from 7.1% (phase 4) to 30.2% (phase 13). In most phases, the 2020 official census recorded higher proportions of uninhabited dwellings (16% to 36%; 23.3% overall), because it counts dwellings without residents registered on the census date, whereas our inventory recorded visible signs of abandonment, including houses informally occupied after their owners left either permanently or temporarily.

Table 2. Inventoried houses by phase and condition, Chulavista housing development

Phase	In good condition	Destroyed	Boarded-up	Occupied (tenure unverified)	"*Renta tu Casa*" Program	Total	Dwellings (2020)	% dwellings
1	22	22	7	31	0	82	956	8.6
2	44	28	46	15	0	133	875	15.2
3	31	6	30	2	0	69	837	8.2
4	28	22	23	0	0	73	1,032	7.1
5	19	18	20	71	0	128	1,027	12.5
6	33	26	10	37	0	106	783	13.5
7	63	48	30	42	0	183	1,130	16.2
8	24	25	10	21	0	80	806	9.9
9	26	20	15	10	0	71	704	10.1
10	35	42	3	12	0	92	744	12.4
11	7	38	24	56	0	125	877	14.3
12	10	23	10	29	6	78	753	10.4
13	7	35	3	96	2	143	473	30.2
14	5	40	9	38	22	114	561	20.3
15	7	20	21	36	27	111	439	25.3
16	27	10	17	9	0	63	593	10.6
17	28	32	19	2	0	81	600	13.5
18	13	19	6	18	0	56	638	8.8
19	24	28	4	5	0	61	787	7.8
Total	453 (24.5%)	502 (27.1%)	307 (16.6%)	530 (28.7%)	57 (3.1%)	1,849	14,615	12.7

Source: own elaboration based on the field inventory (February–April 2023); number of dwellings taken from IIEG (2020).

Figure 4. Inventory of houses by condition in the Chulavista housing development (February-April 2023).



Source: own elaboration based on the field inventory.

Figure 5. Examples of the conditions recorded in the inventory

Vacant, in good condition



Boarded-up



Destroyed or severely damaged



Occupied (tenure unverified)



Source: photographs taken by the first author.

The women's accounts, gathered informally when the maps were collected and later in interviews, helped interpret these categories. They attributed families' departure to repeated burglaries of houses left empty during working hours, the presence of organized crime and the risks it entailed to their families, journeys of two hours or more to workplaces and schools, an irregular water supply, and several other factors related to the lack of adequate infrastructure, public services and government support to improve their living conditions; many families returned to rented housing in the central municipalities of the metropolitan area as soon as they could afford it. Vacant houses were then stripped of anything of value, filled with rubble and waste and, in some cases, used for drug consumption and sale or occupied by newcomers who collect and store garbage or recyclable materials: "they robbed the houses straight away, because they were left empty [...] and squatting came after three or four years; from then on, many squatters, houses being stripped, everything" (Interview 1, September 2024). These are the accounts of long-standing owner-residents; they are not neutral of course, and we acknowledge that the occupants of those houses would probably describe the same process in different terms.

The accounts we gathered also reveal what is at stake for those who bought a house in Chulavista: the Infonavit credit invested in the hope of owning a home instead of renting or sharing a dwelling with relatives, the lack of resources to move elsewhere

once conditions deteriorated, the lack of job opportunities, and concerns about their children growing up in an unsafe environment. Nevertheless, the experiences we documented were not uniform: some of the women considered conditions no worse than where they had previously lived, and the resident who did not take part in the inventory was satisfied to remain in a small area where neighbors maintain close ties (Interview 5, October 2024). In the survey, 66.7% of respondents had bought their house with an Infonavit credit, 81.6% attributed abandonment primarily to insecurity, and 70% reported journeys of one to two hours.

3.2. Scope of the women's participation and fieldwork conditions

The seven participant women covered every street of the 19 phases in nine weeks, where systematic fieldwork by the academic team had been judged too risky by these women and other residents with whom we talked and to whom we disclosed our plan at the onset of fieldwork. They also contributed knowledge that could not be obtained in a single visit: which phases had the most abandoned houses, which areas were the most dangerous, how deterioration had evolved in their own phases, the lack of adequate public spaces for children and the problems of public transport, including informal mototaxis, which residents described as expensive and unsafe and suspected of moving drugs or keeping watch for organized crime groups. This experiential knowledge was particularly useful for adapting the design of the methodological approach, for instance regarding fieldwork and the labeling of the map; yet this type of knowledge was shared informally and not systematically recorded by the academic team.

While taking their children to school, some participants came across human remains left near a school entrance, and during fieldwork they learned of a man who had been tortured and thrown from a pickup truck. They stated that, as women of their age, they could walk through most of the development without major problems, whereas young people and men in their circle, including their sons and husbands, had been victims of crime. This perception should not be overstated, however: survey respondents considered women and men similarly affected by crime (50.5% and 48.8%), and one participant, who recalled not being harmed at drug-selling points at night "simply because I am a woman", added that "now not even women are respected" and that she goes out "but not at any time" (Interview 2, September 2024). In the workshops, young people and adults mapped the most dangerous phases and places associated with drug selling, assaults, killings and clandestine graves. In the survey, 80% of respondents named insecurity as the main problem of the development, 89.1% said it contained unsafe areas and 62.8% reported feeling unsafe in the street at all times.

3.3. Benefits and limitations of the methodological strategy

We highlight three main benefits from the adaptive methodological strategy the academic team and the group of women put into practice despite the risks involved in fieldwork: 1) the seven women produced a very detailed map of house condition and occupation that included all the units across the 19 phases of Chulavista; it provides detail on condition and occupation by phase that census data do not offer; 2) all the

women reported that they had not been exposed to greater risks than usual while doing fieldwork and reported no threats during their surveys; and 3) the fieldwork undertaken by the women was paid and, given they were not engaged in paid labor, they reported it had been valuable as a means to support their families over the weeks that it lasted.

At the same time, we identify several important limitations in our approach: 1) all the women were directly associated with the woman that the first author knew beforehand; therefore, this small network does not offer a fully representative picture of Chulavista residents' perspectives on the housing abandonment problem nor on other issues of concern regarding this development; 2) given the risks for doing "conventional fieldwork", we could not verify the status of the many houses that were occupied (530), which had a significant effect on the assessment of the real magnitude of the housing abandonment phenomenon in Chulavista; 3) although we sought to gather more information through the deployment of conventional methods and cross-validation from official data, we do not have a reliable estimate of the accuracy of the map generated by the women; 4) given the lack of time of the participant women, their limited interest in the housing abandonment problem and safety concerns, we deemed it preferable not to try to systematically gather their experiential knowledge; and 5) the women's participation was limited. as they contributed neither to framing the problem nor to analyzing the data and assess the results and their implications; thus, this arrangement was very far from PNS' ideal of bringing together a diverse set of stakeholders and working together as an EPC.

4. Discussion

In what follows we discuss the main findings with respect to the contributions we anticipated at the end of the Introduction. Our principal focus here, however, is on the methodological and theoretical insights that stem from our case study and their implications for contemporary debates in STS and PNS.

4.1. Empirical implications: Coverage and spatial patterns of housing abandonment in Chulavista

Our spatially explicit inventory of housing abandonment in Chulavista showed that this problem does not create a uniform stock of empty houses. Fewer than a quarter of the inventoried houses were vacant and in good condition, more than half were destroyed or occupied with unverified tenure —although many of the occupied were likely squatted after abandonment as we explained—, and the mix differs sharply between phases. This is consistent with recent work on the transformation, rather than the mere emptying, of Mexico's peripheries of mass social housing (Paquette-Vassalli *et al*., 2025) and on the occupation of vacant social housing (Holguín Ávila & Maycotte Pansza, 2024). Since it records the condition of each house, the inventory distinguishes recoverable from destroyed or reoccupied houses, which census counts of uninhabited dwellings cannot do (Monkkonen, 2019).

4.2. Methodological implications for PNS: Fieldwork and research in violent peri-urban territories

To date, most research carried out on housing abandonment and the problems it creates in Mexico's urban peripheries has been based on official census data, administrative records, GIS analysis, or case studies conducted through conventional fieldwork methods like observation, interviews and informal talks —often off-site for security reasons— (e.g., Rodríguez & Sugranyes, 2005; Monkkonen, 2019; Salinas Arreortua & Pardo Montaño, 2020; González-Ochoa, 2023). Although these studies are important to better understand some of the features of this phenomenon in the country, unlike the approach taken here, they seldom treat territorial access as a key methodological problem. Research in violent settings, however, shows how the production of knowledge is severely constrained by the limited conditions to manage fieldwork within acceptable risks (Rodgers, 2004; Goldstein, 2012; Baird, 2018; Koonings *et al*., 2019).

In Mexico, for instance, the rapid and widespread expansion of organized crime has forced researchers to redefine their routes, interlocutors and forms of presence in the field (Maldonado Aranda, 2014). A key constraint for us in Chulavista was not only the potential risks we could face if we did the inventory, but that our own presence would have made the participants more visible and, thereby, doing fieldwork alongside would have endangered them. Hence, in adapting our strategy to what seemed feasible and ethically appropriate, minimizing risks became the overriding priority. To that end, we took very seriously the experiential knowledge of the women who conducted the inventory.

Our decision to adapt the methodological strategy in a way that kept at least a bounded form of the "science with the people" epistemological-normative goal of PNS has implications that go beyond the specific case of Chulavista. Numerous peri-urban areas in Mexico, Latin America, and other regions of the global South share similar conditions of territorial fragmentation, urban deterioration, institutional weakness, insecurity, and violence (Arias, 2017; Trejo & Ley, 2020; González-Ochoa, 2023). In these contexts, relying exclusively on conventional methods can produce biases associated with difficulties of access, uneven territorial coverage, the under-recording of phenomena that are difficult to observe directly, or even the abandonment of research owing to safety concerns. Our results suggest that adaptive methodologies based on local collaboration, even if participation is certainly bounded, can help partially reduce these limitations; this observation is consistent with studies that highlight the importance of local knowledge for unveiling complex territorial processes in contexts characterized by uncertainty, vulnerability, or restricted access (Cahill *et al*., 2007). The main methodological lesson of the study, therefore, is not that collaboration automatically resolves problems of access, but that it makes it possible to develop forms of research that are more sensitive to the real conditions under which knowledge can be produced in complex territories, particularly those shaped by violence.

4.3. Theoretical implications for PNS: "Bounded science with local people" and the limits of extended peer communities

"Science with the people" is not a method that replaces EPCs but the epistemological and normative orientation of PNS, which EPCs put into practice (Funtowicz & Ravetz,

2000; Funtowicz & Hidalgo, 2024). Our case study in Chulavista shows that the viability of EPCs depends on a set of conditions that cannot be taken for granted (Turnpenny *et al*., 2011; Orozco-Meléndez *et al*., 2024) and adds criminal control of the territory to the power asymmetries that may hinder collaborative research.

What we have called here "Bounded Science with Local People" retains one element of that orientation and lacks another: the participant women contributed extended facts that would have remained concealed otherwise, but the assessment of the quality of the resulting knowledge was not extended to them (Funtowicz & Ravetz, 1993; Bidwell, 2009). Nevertheless, and unlike key informants or focus-group participants whose accounts are interpreted only by researchers, the women produced the primary data in the territory, and their capacity for embeddedness and "discreet mobility" were the conditions of possibility that enabled the completion of this research. Unlike a small EPC, the workings of our seven-women group involved neither plural deliberation nor extended peer review. In that sense, we could not adopt a typical PNS framework but drew inspiration from its epistemological-normative goal.

Furthermore, the housing abandonment problem is post-normal, and the results attained show each of its defining features (Funtowicz & Ravetz, 1993). First, facts are uncertain: for instance, the tenure of 530 occupied houses is unknown, our inventory and the official census measure abandonment differently, and its causes and chronology can neither be accurately reconstructed house by house nor at the housing development scale. Second, values are in dispute: property, security and the right to housing largely diverge for owners who stayed, for owners who prefer to lose a house rather than keep paying for it (Interview 3, September 2024) and for those who found precarious shelter in abandoned houses. Third, stakes are high: a housing credit, the impossibility of moving elsewhere, the lack of job opportunities nearby, the safety of children. And fourth, decisions are urgent: vacant houses continue to be stripped and destroyed, violence and criminal control are widespread and persistent, and governmental inaction becomes more acute as the problem grows. Our study could make these stakes and values visible only partially, and from particular positions; an EPC would have been the space in which to deliberate on them.

This partiality bears on the risk of epistemic extractivism (Grosfoguel, 2016) in participatory research (Cahill *et al*., 2007). The participants were paid, but the woman who assessed the experience saw no tangible benefits beyond the payment. The final map was shown to them at a closing meeting without copies being left because of safety concerns, and the results have not been discussed with the wider community for the same reason. We gave the map and the survey results to the director of the school where the first participatory mapping workshop was held. In addition, in early 2025 we shared an inventory map with the Federal Ministry of Agrarian, Territorial and Urban Development (SEDATU) for a project on abandoned housing, and the results have been presented in academic seminars and public forums, but none of this has made its way into decision-making. Reflecting on our experience in this case, we propose five conditions to enact a non-extractive "bounded science with local people" in violent territories: fair payment, not adding risks to participants from those they already face, protecting their anonymity during and after their participation, returning knowledge

to them in a form that is relevant and does not compromise their safety, and trying to connect the findings with decision-making processes so that the study elicits actionable knowledge —even if it is uncomfortable knowledge (Orozco-Meléndez & Paneque-Gálvez, 2024). We argue that our study met the first four but not the last one, although for reasons that went beyond our possibilities.

Can research inspired by PNS then be carried out where an EPC cannot be formed without unacceptable risks? Our case suggests it can, though only in a bounded form. We have shown that a bounded arrangement can incorporate extended facts, make stakes and values visible, and bring research closer to those affected, which is consistent with the ethos of PNS when the problem is post-normal. Yet, such a limited approach cannot make room for extended peer review, plural deliberation or legitimacy for decisions, all of which have remained key aspects of PNS from its inception (Funtowicz & Ravetz, 1993; Funtowicz & Ravetz, 2025). Whether bounded arrangements for participation in dangerous contexts can be considered a partial form of PNS practice, or rather a legitimate but an insufficient approach insofar as EPCs are seen as totally necessary, is a question for debate in our view. An important one, nonetheless, as in much of Latin America, the conflicts PNS was designed to address unfold in violent territories.

Conclusions

In this article we asked whether research inspired by PNS can be carried out in dangerous territories where EPCs cannot be established without exposing participants to unacceptable risks, and what forms of participatory knowledge production are then possible. To answer these questions, we conducted a case study in Chulavista, a large-scale low-income housing development that sits on the peri-urban fringe of Guadalajara, Mexico, which is well known due to the criminal governance that exerts a violent territorial control and a high number of abandoned houses. Given the constraints to do fieldwork as external researchers and to establish an EPC to operationalize a PNS study on this problem, we adapted our methodological strategy and came up with a form of "bounded science with local people" based on the paid participation of seven long-term resident women, recruited through a network of trust. This group of women produced an inventory of 1,849 houses across the development's 19 phases, of which 1,262 were vacant and 530 occupied with unverified tenure.

We identify three main contributions from this study. Methodologically, the case shows how fieldwork can be redesigned when the presence of external researchers is itself a significant source of risk both for themselves and participants, and what this may mean regarding the feasibility of "doing PNS" in violent territories like Chulavista. Theoretically, through our case study we clarify the distinction between "science with the people" as the epistemological-normative orientation of PNS, and EPCs as its typical methodological approach; additionally, our case illustrates a form of "bounded science with local people" that incorporates extended facts from participants without extending peer review given the unfeasibility of creating an EPC; finally, we propose a set of five conditions for participatory research not to be extractive in unsafe contexts. Empirically,

we document that housing abandonment takes different forms, with destruction and occupation outweighing simple vacancy.

Further research should examine how similar arrangements in other violent territories could build in, from the outset, the documentation of participants' contributions, their protection after fieldwork and the return of knowledge to them. It should also attempt to include more local perspectives providing safe opportunities for greater interactions between stakeholders. Another avenue worth exploring may be if bounded arrangements can open the way to EPCs over time, for example through schools, community centers or housing agencies. Whether PNS can be practiced in violent territories where EPCs are not feasible remains an open question for the PNS community.

Financing

Enrique García-Becerra acknowledges financial support through a full PhD grant by SECIHTI (CVU: 378282). Jesús Rodríguez Rodríguez and Jaime Paneque-Gálvez are grateful for receiving financial support through SECIHTI ' SNII program (CVU: 121982 and 589399, respectively). In addition, Paneque-Gálvez acknowledges support from DGAPA-UNAM to develop this line of inquiry, particularly through the PAPIIT IN304221 project he led.

Acknowledgements

The authors would like to express their deep gratitude to the group of seven women without whom this study would not have been possible. They are also thankful to the people who participated in the workshops, questionnaire and interviews. Finally, Jaime Paneque-Gálvez would like to acknowledge Ana Muñoz van den Eynde's and Marta I. González García's invitation to participate in this PNS dossier, and thanks to Manuel Crespo for his patience and support throughout the revision and publication processes.

Conflict of Interest

The authors declare that there is no conflict of interest.

CRediT

EGB: Investigation; Methodology; Formal Analysis; Visualization; Writing – Original draft. *JRR*: Investigation; Writing – Original draft; Project administration; Funding

acquisition. *JPG*: Conceptualization; Writing – Original draft; Writing – review & editing; Validation; Visualization; Supervision.

Declaration on the use of AI

The authors have not used AI for content generation, but have used Claude and DeepL for language translation and minor editions, which have been manually checked and edited as appropriate before submission. The authors take full responsibility for the content of the article.

References

Arias, Enrique Desmond (2017). Criminal enterprises and governance in Latin America and the Caribbean. Cambridge University Press.

Ayuntamiento de Tlajomulco de Zúñiga (n/d). Tlajomulco Gobierno Municipal. Retrieved from: https://tlajomulco.gob.mx/.

Baird, Adam (2018). Dancing with danger: Ethnographic safety, male bravado and gang research in Colombia. Qualitative Research, 18(3), 342–360. DOI: https://doi.org/10.1177/1468794117722194.

Bidwell, David (2009). Is community-based participatory research postnormal science? Science, Technology, & Human Values, 34(6), 741–761. DOI: https://doi.org/10.1177/0162243909340262.

Blazquez, Adèle (2025). Dawn rose on a dead body: Armed violence and poppy farming in Mexico. University of California Press.

Blazquez, Adèle & Le Cour Grandmaison, Romain (2021). Regional configurations of violence in Mexico: Accumulation, control and representation. European Review of Latin American and Caribbean Studies / Revista Europea de Estudios Latinoamericanos y del Caribe, 112, 51-69. DOI: https://doi.org/10.32992/erlacs.10871.

Cahill, Caitlin, Sultana, Farhana, & Pain, Rachel (2007). Participatory ethics: Politics, practices, institutions. ACME: An International Journal for Critical Geographies, 6(3), 304–318. DOI: https://doi.org/10.14288/acme.v6i3.779.

Cronin-Furman, Kate & Lake, Milli (2018). Ethics abroad: Fieldwork in fragile and violent contexts. PS: Political Science & Politics, 51(3), 607–614. DOI: https://doi.org/10.1017/S1049096518000379.

Duarte Villa, Rafael, Braga, Camila de Macedo, & Ferreira, Marcos Alan S. V. (2021). Violent nonstate actors and the emergence of hybrid governance in South America. Latin American Research Review, 56(1), 36-49. DOI: https://doi.org/10.25222/larr.756.

Durán-Martínez, Angelica (2018). The politics of drug violence: Criminals, cops and politicians in Colombia and Mexico. Oxford University Press.

Eriksson Baaz, Maria & Utas, Mats (2019). Exploring the backstage: Methodological and ethical issues surrounding the role of research brokers in insecure zones. Civil Wars, 21(2), 157–178. DOI: https://doi.org/10.1080/13698249.2019.1656357.

Farrell, Katharine N. (2011). Snow white and the wicked problems of the west: A look at the lines between empirical description and normative prescription. Science, Technology, & Human Values, 36(3), 334-361. DOI: https://doi.org/10.1177/0162243910385796.

Funtowicz, Silvio O. & Hidalgo, Cecilia (2024). Epistemología política: ciencia con la gente. Revista Iberoamericana de Ciencia, Tecnología y Sociedad, 19(55), 215–228. DOI: https://doi.org/10.52712/issn.1850-0013-454.

Funtowicz, Silvio O. & Ravetz, Jerome R. (1993). Science for the post-normal age. Futures, 25(7), 739-755. DOI: https://doi.org/10.1016/0016-3287(93)90022-L.

Funtowicz, Silvio O. & Ravetz, Jerome R. (2000). La ciencia posnormal: Ciencia con la gente. Barcelona: Icaria Editorial.

Funtowicz, Silvio O. & Ravetz, Jerome R. (2003). Post-Normal Science. International Society for Ecological Economics — Internet Encyclopaedia of Ecological Economics, pp. 1–10. Retrieved from: https://www.isecoeco.org/pdf/pstnormsc.pdf.

Funtowicz, Silvio O. & Ravetz, Jerome R. (2025). Knowledge, power, and participation in the post-normal age. Ecological Economics, 237, 108716. DOI: https://doi.org/10.1016/j.ecolecon.2025.108716.

García Becerra, Enrique (2025). Evaluación del periurbano y las condiciones de vulnerabilidad desde el enfoque de la ciencia posnormal. El fraccionamiento Chulavista, Tlajomulco de Zúñiga, Jalisco, entre 2000 y 2020 [Doctoral Thesis]. Guadalajara: Universidad de Guadalajara.

García Becerra, Enrique & Rodríguez Rodríguez, Jesús (2025). Geografía posnormal y crisis socioterritoriales: Una propuesta epistemológica y metodológica para espacios periurbanos. Revista Iberoamericana de Economía Ecológica, 38(1), 1-15. Retrieved from: https://redibec.org/ojs/index.php/revibec/article/view/618.

Ghosh, Devleena (2018). Risky fieldwork: the problems of ethics in the field. Energy Research & Social Science, 45, 348-354. DOI: https://doi.org/10.1016/j.erss.2018.07.020.

Giatti, Leandro Luiz (2019). Participatory research in the post-normal age. Springer International Publishing. DOI: https://doi.org/10.1007/978-3-030-27924-0.

Gobierno de México (n/d). Comisión Nacional de Búsqueda de Personas. Retriewed from: https://comisionacionaldebusqueda.segob.gob.mx/.

Goldstein, Daniel M. (2012). Outlawed: Between security and rights in a Bolivian city. Duke University Press.

González-Ochoa, Dinorah Judith (2023). Policy-induced suburbanization: Mass-produced housing and location choices in Tijuana, Mexico. Housing Policy Debate, 33(3), 681-698. DOI: https://doi.org/10.1080/10511482.2021.2001671.

Grosfoguel, Ramón (2016). Del "extractivismo económico" al "extractivismo epistémico" y al "extractivismo ontológico": Una forma destructiva de conocer, ser y estar en el mundo. Tabula Rasa, 24, 123-143. DOI: https://doi.org/10.25058/20112742.60.

Harner, John, Jiménez Huerta, Edith R. & Cruz Solís, Heriberto (2017). Housing and urban growth in Guadalajara, Mexico. In Silver, Christopher, Freestone, Robert & Demaziere, Christophe (Eds.), Dialogues in Urban and Regional Planning 6: The right to the city (105–133). Routledge. DOI: https://doi.org/10.4324/9781315628127.

Hernández Villalvazo, Alma Leticia (2017). Jóvenes del sector popular en Chulavista, Tlajomulco: Entre injusticias y exclusión socio-urbana y habitacional. Vínculos. Sociología, Análisis y Opinión, 10. Retrieved from: https://revistavinculos.cucsh.udg.mx/index.php/VSAO/article/view/7440.

Holguín Ávila, Raúl & Maycotte Pansza, Elvira (2024). Vivienda social invadida y la percepción de soledad: Un estudio de caso sobre los fraccionamientos con viviendas deshabitadas en el suroriente de Ciudad Juárez. Nóesis. Revista de Ciencias Sociales y Humanidades, 33(66), 57–74. DOI: https://doi.org/10.20983/noesis.2024.2.4.

Instituto de Información Estadística y Geográfica de Jalisco (2020). Información sociodemográfica por colonia, con base en el Censo de Población y Vivienda 2020. Retrieved from: https://iieg.gob.mx/ns/.

Instituto de Información Estadística y Geográfica de Jalisco (2024). Plataforma de seguridad: Delitos georreferenciados, Chulavista, 2017–2024 [Data set]. Retrieved from: https://iieg.gob.mx/plataforma_seguridad/.

Instituto Nacional de Estadística y Geografía (2020). Censo de Población y Vivienda 2020. Retrieved from: https://www.inegi.org.mx/programas/ccpv/2020/.

Koonings, Kees, Kruijt, Dirk & Rodgers, Dennis (2019). Ethnography as risky business: Field research in violent and sensitive contexts. Lexington Books. DOI: https://doi.org/10.5771/9781498598446.

Krause, Jana (2021). The ethics of ethnographic methods in conflict zones. Journal of Peace Research, 58(3), 329–341. DOI: https://doi.org/10.1177/0022343320971021.

Lessing, Benjamin (2021). Conceptualizing criminal governance. Perspectives on Politics, 19(3), 854–873. DOI: https://doi.org/10.1017/S1537592720001243.

Lomnitz, Claudio (2023). Para una teología política del crimen organizado. México: El Colegio Nacional / Ediciones Era.

Maldonado Aranda, Salvador (2014). Despejando caminos inseguros: Itinerarios de una investigación sobre la violencia en México. Alteridades, 24(47), 63-76. Retrieved from: https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0188-70172014000100007.

Monkkonen, Paavo (2019). Empty houses across North America: Housing finance and Mexico's vacancy crisis. Urban Studies, 56(10), 2075–2091. DOI: https://doi.org/10.1177/0042098018788024.

Orozco-Meléndez, Francisco & Paneque-Gálvez, Jaime (2024). Co-producing uncomfortable, transdisciplinary, actionable knowledges against the corporate food regime through critical science approaches. Environment, Development and Sustainability, 26(12), 29863-29890. DOI: https://doi.org/10.1007/s10668-023-03377-9.

Orozco-Meléndez, José Francisco, Paneque-Gálvez, Jaime & Kovacic, Zora (2024). Problematizing post-normal science in the Global South. Environmental Science and Policy, 161, 103867. DOI: https://doi.org/10.1016/j.envsci.2024.103867.

Paquette-Vassalli, Catherine, Esquivel, María Teresa & Pedrotti, Carolina Inés (2025). Después del abandono: La transformación de las periferias de vivienda social masiva en México. Revista INVI, 40(115), 319–344. DOI: https://doi.org/10.5354/0718-8358.2025.78509.

Reyes, Alejandra (2021). Mexico's housing crisis: Vacancy, limited access and deaf policy responses. International Journal of Urban Sciences, 25(sup1), 167–194. DOI: https://doi.org/10.1080/12265934.2020.1776145.

Rodgers, Dennis (2004). "Disembedding" the city: Crime, insecurity and spatial organisation in Managua, Nicaragua. Environment and Urbanization, 16(2), 113-124. DOI: https://doi.org/10.1177/095624780401600202.

Rodríguez, Alfredo & Sugranyes, Ana (2005). Los con techo: Un desafío para la política de vivienda social. Santiago de Chile: Ediciones SUR. Retrieved from: https://repositorio.fadu.edu.uy/items/7fa98e0f-c77c-454a-9952-3d05a42a7454.

Salinas Arreortua, Luis Alberto & Pardo Montaño, Ana Melisa (2020). Política de vivienda y habitabilidad en la periferia de la Zona Metropolitana del Valle de México.

Revista de Geografía Norte Grande, 76, 51-69. DOI: https://doi.org/10.4067/S0718-34022020000200051.

Strand, Roger (2017). Post-normal science. In Clive L. Spash (Ed.), Routledge Handbook of Ecological Economics (288-298). Routledge.

Trejo, Guillermo & Ley, Sandra (2020). Votes, drugs, and violence: The political logic of criminal wars in Mexico. Cambridge University Press.

Turnpenny, John, Jones, Mavis & Lorenzoni, Irene (2011). Where now for post-normal science? A critical review of its development, definitions, and uses. Science, Technology, & Human Values, 36(3), 287–306. DOI: https://doi.org/10.1177/0162243910385789.

Valencia, Sayak (2016). Capitalismo gore. Barcelona: Paidós.

Villar Calvo, Alberto Javier & Méndez Ramírez, José Juan (2014). Dos décadas de política habitacional neoliberal y su impacto en la producción de vivienda social en México: El caso del Instituto del Fondo Nacional de Vivienda para los Trabajadores (INFONAVIT) (1992–2010). Proyección, VIII(16), 176-197. Retrieved from: https://bdigital.uncu.edu.ar/7876.

Wacquant, Loic (2007). Territorial stigmatization in the age of advanced marginality. Thesis Eleven, 91(1), 66-77. DOI: https://doi.org/10.1177/0725513607082003.

Yin, Robert K. (2009). Case study research: Design and methods. SAGE.

Wladyka, David & Yaworsky, William (2017). The impact of researchers' perceptions of insecurity and organized crime on fieldwork in central America and Mexico. Human Organization, 76(4), 370-380. Retrieved from: https://www.jstor.org/stable/26586860.