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Abstract

This paper introduces the concept of insurgency, which stems from planning theory, and presents how it could be adapted to the building of insurgent data. It articulates how informal communities could employ autonomous strategies to build data that counteracts the monopoly of information, which is largely held by the State. The paper presents a brief critique of data on informal settlements by presenting the case of the city of Fortaleza, Brazil. It concludes by suggesting alternative methods for planning, collecting and disseminating data that is reflective of communities' values and can further their right to the city. Social and political movements generated by minorities are necessary and information is key in transforming grassroots action to legitimate policy. Insurgency in planning and information building provides a point of entry to the larger discussion of who produces information about various segments of society and how that influences their Right to the City.

Keywords: Insurgent planning, Informal Settlements, Data, Community assets

Despite an increase in the volume of information generated nowadays, it is still clear that data is neither open nor fairly representative. Authorities in government have historically held a large monopoly on the production of data. Maps, for instance, are a powerful tool to summarize facts according to the perspective that the State wanted to maintain, which perpetuates the logic through which that map was designed. Subjects are vulnerable to how data is made, and policies that continue to restrain lifestyles based on technocratic interpretations of what make up specific groups (Ruppert et al., 2017). This is not a new phenomenon. The large interventions of the Modern Era through slum clearance and standardized housing are the desire of an elite that wanted to bring development by enforcing "enormous changes in people's habits, work, living patterns, moral conduct, and worldview (Scott, 1998, p. 89)." What is striking is that those interventions would hardly have achieved the same scale were it not for the data provided by Le Corbusier on what constitutes the *modulor* man. This standard for human dimensions was used to justify the equally standardized solutions for economic and social development.

This case is an example of a key issue of data: "the process of constructing data builds social values and patterns of privilege into the data." (Johnson, 2014, p. 265). Thus, as expert knowledge creates information it perpetuates policies that exclude certain populations from power and visibility to make claims (Rosenström, et al., 2006). This data is then used to inform research and policy under the false assumption of representation when, in fact, the conditions under which that data was constructed are not revealed. Models and algorithms make up 'black boxes' that hold secretive information that is "unavoidably linked to institutionalized patterns of power and authority (Crawford, 2016, p. 78)". They "use people's fear and trust in mathematics to prevent them from asking questions" and contribute to an established political and institutional logic (O'Neil, 2016).

The digital revolution has certainly enabled economic growth and improvements in life quality when it comes to a clean environment, education, health care and safety, to name a few. However, issues of misinformation and trust have become increasingly prevalent. The use of Big Data from social networks and algorithms to target and spy on voters are examples of the risk that large data corporations pose for the democratic State (Unsworth, 2016). Society has recently started to openly refuse the role of science to generate commonsense and provide universal answers, which makes data even more applicable and powerful for manipulation (Gauchat, 2011). Changes in political regimes witnessed in Latin America, for instance, have enabled extremist candidates to selectively collect and disseminate a narrative that suppresses the voices of informal dwellers, indigenous groups and minorities. Other institutions have reportedly deleted climate change-related reports to mask the severity of environmental challenges (Herrmann, 2017).

Considering those challenges, this paper seeks to introduce the concept of insurgency, which stems from planning theory, to inform a theoretical framework for insurgent data building. The paper uses a case study approach to identify shortages on the data constructed on informal settlements in the Brazilian city of Fortaleza. Based on that example, it articulates how informal communities could employ autonomous strategies to build data that counteracts the monopoly of information, which is largely held by the State. It concludes by suggesting alternative methods for planning, collecting and disseminating data that is reflective of communities' values can further their right to the city.

2 Issues of data and information to study informal settlements

Since the construction of information tends to exclude those less inclined to be involved in technical processes, those stakeholders also tend to be most affected as the gap between representation and action increases. A clear example of that is found in the urban planning realm, and in how policies have long tried to manage informal settlements. Even the various terms used to talk about informal settlements reflect views that shift between hostile and hopeful. Squatter settlements, informal, spontaneous and slums have all been used with different semantic connotations to support romantic or hygienic narratives (MacDonald, 1978). In Brazil, the term 'favela' was coined and is largely employed to refer to those more socio-economic vulnerable neighborhoods. Most terms are symptoms of the top-down evaluations made about settlements and its dwellers. In Brazil, rational planning historically dealt with informal growth by employing complex zoning and projects that overlooked what existed in cities and treated favelas as a malaise to be eradicated (Rolnik, 2000).

Such top-down revision of laws and parameters was informed not just by architecture principles but by nationally sponsored census data. In 1950, the first Brazilian census included favelas, which were referred to as 'subnormal conglomerates'. The areas were mapped based on local knowledge and social consensus to characterize occupations with subpar infrastructure (Motta, 2019). The variables collected detailed the built environment, but information about housing structure and construction materials was suppressed or simplified in later census. The absence of this crucial data about the housing unit made it impossible to understand the evolution of those settlements and how they become consolidated over time (Taschner, 2001). Motta analyzes

three national censuses (1950, 1991 and 2010) to show how the datasets have systematically evolved to construct favelas as spaces of disorder and illegality (Motta, 2019).

Challenges in the favela census remain as new urban legislation demands new approaches to engage with informal settlements. The recent Statute of the City in 2001, for instance, strengthened the role of local government in promoting land reform that ensures the right to housing and the right to participation (Fernandes, 2007). Governments were immediately faced with the challenge of mapping and surveying informal settlements, which, in 2010, made up nearly 12% of the Brazilian urban population (IBGE, 2010). However, making those territories visible posed a new set of challenges for informal dwellers who found themselves more vulnerable. On one hand, informality has remained precarious at the margins of full citizenship due to systemic abandonment and State blindness. On the other hand, their invisibility has also granted them "protection and autonomy from a predatory society where the state does not always act in the interests of the less powerful." (Freeman, 2014, p. 31).

This tension generated by State interventions in favelas could be witnessed in Rio de Janeiro preceding the 2016 Olympics. Urbanization efforts had the goal of mapping the areas, creating a formal street address system and embellishing the built environment. However, the easier wayfinding also facilitated control by drug dealers and charging for public services (such as electricity). Also, the aesthetic measures such as painting facades created an identity but also uniformity, and made it easier for homes to be identified by the police and also for demolition. Finally, mapping allowed for policing pacification efforts and clearly marked areas to be displaced under the pretense of environmental hazards (Freeman, 2014).

3 Insurgency: Definition and Implications to Informal Settlements

What the previous section shows is that urban upgrading is not just an infrastructure issue and that spatial change is not enough to include marginalized societies in the political agenda. As an alternative, the theoretical framework of insurgency provides support to alternative modes of urban production that are led by the grassroots. Insurgency is presented in the emerging planning theory to critique current governance systems that have historically reflected the interests of dominant groups and uprooted displacement and exploitation in post-modern cities.

By drawing on this, insurgent planning also allows for a different analysis of the informal: one which recognizes it not just a space of poverty but also of popular political organization, entrepreneurialism and self-organizing communities (Roy, 2011). Informal dwellers constantly reevaluate authoritarian government roles by asserting their rights to create their own living spaces: "insurgent planning is guided by an understanding of citizenship as a practice constructed from below through citizens' direct action for the development of their self-determined political community (Miraftab, 2012, p. 16)."

However, not all participation initiatives should be viewed as insurgent. The inclusion of dwellers in decision-making processes can also be used as a tool for political manipulation in which shallow conversations only validate government decisions made behind closed doors. Thus, a key aspect of insurgent planning is that it addresses how neoliberal capitalism has claimed to include citizens through participatory mechanisms that are, in reality, established to stabilize radical ideas (Miraftab, 2009). Organized housing movements in Fortaleza show that the real insurgency is the process through which dwellers confront state decisions and maintain an autonomous system of checks and balances. By holding regular community meetings, a network of activists is able to monitor state actions, shed light on the political structure that excludes them, prevent cooptation of leadership and demand mechanisms for land regulation (Freitas, 2019).

The gap in knowledge and power experienced by marginalized communities is addressed through insurgency in two ways: by collecting information to gain clarity on issues hidden from them, and by seeking support and partnerships with institutions that can validate their complaints (Laskey and Nicholls, 2019). In that context, insurgent data building is presented here as a third front through which communities can create alternative discourses that contest information disseminated by third parties. Since insurgency highlights the vibrancy of marginalized communities, insurgent data can support that process by building on and promoting local knowledge. In the urban realm, citizens can use to people-controlled information to reclaim spaces in opposition to the centralizing role of governments.

Even though the notion of insurgency has emerged, insurgent data is not an established practice, and technocratic state institutions still hold power on how data gets translated to policy. An example of that is presented in the next section.

4 The case of Fortaleza: dataset on precarious settlements

In 2012, the municipality of Fortaleza located in the Northeast of Brazil started to develop a Local Social Interest Housing Plan (PLHIS in the Portuguese acronym) with strategies to address the housing shortage, which largely affects low-income populations. Based on the document, we highlight three key goals of PLHIS: 1. to map and create a database about all precarious settlements in Fortaleza, 2. to develop criteria for risk assessment, and 3. to do so through a collaborative process (Fortaleza, 2013). This collaboration could take place by including local councils and representatives or by promoting workshops in strategic areas that invited the public to debate. The plan employs the terminology of precarious or subnormal settlements interchangeably to refer to the areas that house the poorest population. The PLHIS team identified from the beginning specific challenges of housing in Fortaleza: environmental and social vulnerability and inequality. In terms of outcomes, the plan sought to quantify a budget on resources needed to face the issues mapped.

The PLHIS dataset provided a “diagnosis” on the state of all settlements and strategies for future development. A total of 113 variables were filled out to make up the PLHIS database and a summary of the information collected is found in Table 1.

Category	General Information
1. General Characteristics	Name and age of settlement, location, area, tenure status;
2. Built Characteristics and Infrastructure	Access to services: water, electricity, sewage, street network, social equipment; Building characteristics: height, construction finishes, settlement consolidation; Past and future interventions;
3. Environment (hazard, compliance, risks)	Type of risk: environmental (flood, mudslide) or man-made (development induced); Level of adequacy; Special zoning ordinance: environmentally protected area of inclusionary housing;
4. Demographic Information (socio-economic)	Number of dwellers and families, Density, Income; presence of social/community organization
5. Diagnosis I: Typology	Type of settlement (self-built, favela, housing project, illegal parcels), possibility for consolidation/eradication;
6. Diagnosis II: Deficits and Needs	Number of dwellings to be removed/urbanized/regulated, Demand: number of units to be built, land area needed to build new housing or for displaced dwellers, Intervention proposed: resettlement, tenure regulation, urbanization, Budget estimate for intervention proposed.

Table 1: General information compiled in PLHIS database divided by categories. Source: Fortaleza, 2013.

The plan achieved a comprehensive mapping of 846 total settlements for the entire city, which encompass different types of occupation: self-built, favela, housing project or illegal parceling. Despite the acknowledgment that all settlements are not homogeneous and present different typologies, the terminology employed of “precarious” implies a pre-established notion of something unfit and influences the variables collected. The number of variables is surprising, but most focus on risk assessment and characteristics of the built space such as availability of infrastructure. One variable, for instance, determines whether the settlement is “adequate” and another whether the settlement can be consolidated (remain) or needs some degree of resettlement (displacement). The two last Diagnosis categories are created to translate all those conditions into so-called “priority indexes”. The index informs what type of intervention is needed in each settlement and what areas should be prioritized based on their level of precariousness. This outcome is to be expected considering that the Plan was also supposed to establish the concept of risk by looking at environmental, living and socio-economic conditions.

What we highlight here is that, even though the mapping process had a degree of collaboration and local knowledge to fill out the responses, the variables had already been pre-selected. Dwellers were invited to contribute to filling out the gaps within a rigid structure of information that revolved largely around risk assessment and the built environment. Additionally, the few variables related to history, social and cultural

capital have been left with a substantial amount of incomplete data. For instance, the “age of settlement” variable has about 35% missing values and the “community organization” variable has as much as 44% missing. These variables are instrumental in determining social ties to space and whether a network of solidarity has been established over time. No, or close to none, information was collected to examine more intangible aspects of these communities, such as entrepreneurship, social capital, religious organizations, neighboring or place attachment.

After PLHIS variables were collected and analyzed, in 2016 the municipality put together an Atlas of all precarious settlements in which it selected 41 variables that better explained the living conditions of each settlement (out of 113). The goal of the Atlas was to provide information on precarious settlements in clear terms and simple format to guide government interventions. This process further reduced the complexity of those communities through an even narrower lens of cost-benefit analysis.

It is worth noting that the PLHIS dataset united data that was dispersed throughout multiple government entities and linked them to communities and maps. This facilitates the sharing and dissemination of information on precarious settlements. It also constitutes an advance in data gathering since those areas are not usually thoroughly surveyed by municipal plans or censuses. However, those settlements are almost deemed to fail by design, since the bias of risk and precariousness built into the dataset will be turned into action, most likely of eradication and displacement. The case of Fortaleza illustrates an approach to informal settlements, which “perceived and labeled target groups in terms of deficits or lacks (Missingham, 2017, p. 341).” The participatory process invites the inclusion of community members but is an example of the illusion of empowerment through which neoliberalism thrives (Miraftab, 2009).

5 Insurgent Data Building as a Response: Framework and Strategies

According to previous sections, this paper identifies some issues with current systems of data production and sharing:

- The State sovereignty in creating and manipulating information is highly problematic since it is often “structurally committed to the reproduction of the status quo”, which represents those historically in power (Souza, 2006);

- Secretive algorithms prevent people from asking questions and enclose large amounts of data in 'black boxes' that guide our everyday decisions without clarity (O'Neil, 2016);

- Data on informal settlements are especially susceptible to manipulation to further a top-down agenda of urban dispossession.

- By taking a critical look at the case of Fortaleza, it is also possible to identify three main issues on how PLHIS was produced:

- Limiting variables of interest;

- Limiting development strategies based mostly on deficits; and

- Information that gets manipulated to justify authoritarian action.

Despite those challenges, insurgent data can be an alternative to challenge that monopoly. Insurgent data building is presented here as a bottom-up process to generate information with the goal of furthering the agenda of marginalized communities. This autonomy is an antithesis to the systems that perpetually concentrate power and information in the hands of a few (Miraftab, 2012). Thus, insurgent data building may offset those failures in processes that allow communities to set their own agenda regarding variables of interest, use the data gathering process for empowerment, and employ that information for concrete action. A framework for how to develop and employ insurgent data combines these concepts in three key steps (Figure 1).

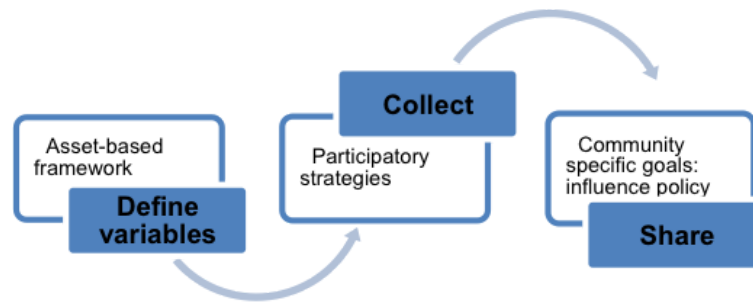


Fig. 1: A framework for insurgent data building. Source: Developed by the Authors, 2019

5.1 Strategies

An issue identified in the case of Fortaleza is that indicators established for evaluation are often not participatory and tend to under-represent those less likely to be part of data producing interactions. When it comes to vulnerable populations such as informal dwellers, citizen participation should be encouraged from the beginning, not to fill the gaps but to establish community indicators that meet their visions for development. The data design process can be used as a tool for empowerment as people assess what they consider important in the community and existing assets. Translating that into indicators ensures that the metrics used by practitioners are reflective of people's needs and accurately depict their political communities (Sandoval and Rongerude, 2015). In that sense, technological tools such as Geographic Information Systems (GIS) can allow users to manipulate large volumes of information through systems for positioning, data acquisition, data dissemination, and analysis (Goodchild, 2009). GIS, like any other interface, can be problematic since a large number of functionalities and tools may limit user experience. However, evolutions in interface design can promote user empowerment to not just display graphic information but also facilitate dialogue and user creation of new knowledge (Furtado, et al., 2016).

Another characteristic of PLHIS was that the rationale behind it consisted of identifying the deficit in the communities it targeted. As an alternative to the needs-oriented strategy, Asset Based Community Development (ABCD) is designed to help communities identify resources and capabilities that could be mobilized for community development. The participatory character of ABCD is especially valuable to promote insurgency: "the appeal of ABCD lies in its premise that people in communities can organize to drive the development process themselves by identifying and mobilizing existing (but often unrecognized) assets (Mathie and Cunningham, 2003, p. 474)." Similarly, the Community Capitals Framework also offers us a new viewpoint from which to analyze holistic community changes. The framework encourages comprehensive thinking about strategies and projects, offering insights into additional indicators of success as well as potential areas of support (Emery and Flora, 2006). Within this concept, the community capitals framework categorizes the various resources that a community has to offer into seven different capitals. In the case of informal settlements, examining solely its economic, built and natural capitals is short-sided since it does not account for more prevalent capitals such as social, human and political. Asset mapping contrasts negative narratives that have been established over time and have led to inertia, discouragement or harmful action. Additionally, to invest in assets is a critical step to turn those potential areas into capital.

Another key issue to be considered is who should retain the monopoly of how data can be manipulated and shared. Collective data mapping and creation are initial steps that should be followed by strategic data dissemination. In that sense, we must monitor how the knowledge on informal settlements is produced and shared based on different reasoning. As mentioned, dwellers must have the autonomy to select which internal aspects should become visible, since information can be appropriated by external stakeholders to coopt leadership, facilitate police patrolling, political lobbying, and so on. Nonetheless, if data creation was previously a tool of control historically adopted by the State, new technologies can now democratize this process and empower informal communities.

Curiously, examples of an insurgent data building process have also been reported in Fortaleza. An outreach project put in place in 2011 by the Federal University of Ceará and the NGO Cearah Periferia mapped out existing informal settlements and empty lots that were zoned specifically to house low-income homes. Students and faculty involved studied the urban regulation and provided technical support for the community through workshops that taught the population on their rights and potentials (Pequeno, 2014). This example shows how maps and data collection have allowed citizens to recognize their homes within the legislation, and make claims in a long process towards the right to the city (Freitas, 2017). In that sense, technical knowledge was instrumental to raise awareness of the issues and to showcase the tools available. However, the population ultimately developed agency over the data. This process does not necessarily need to happen

without institutional support, but it is imperative that dwellers set their own agenda and employ information accordingly.

6 Conclusion: Contributions of Insurgent Data

The goal of this paper was to introduce how data-building strategies could be appropriated by informal communities to create new terms of engagement that are adequate to their goals. The process of data building can be empowering in and of itself, and bottom-up data creation about the informal is fundamental to implement more people-controlled urban development strategies. The dataset compiled by the municipality of Fortaleza as part of its social housing plan is a concrete case that shows how the construction of information influences policies on informal settlements.

As an alternative, insurgent data creation and sharing can be used not to merge informal dwellers to an existing system but to give them autonomy. Social and political movements generated by minorities are necessary, and information is key in their process from transforming grassroots to legitimate action and law. This paper seeks to highlight the importance of insurgency, which is inherently from the bottom up. It is a contribution of insurgency to consider the potential of the "colonized other" (Roy, 2011), and insurgent data can be systematized into representative datasets and processes that shift power to historically silenced communities.

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