Of Our Territory, We Know: social mapping experience for emergencies and disasters

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Abstract *The article presents the project "Of Our Territory, We Know" (De Nosso Território Sabemos Nós), carried out in two communities in the mountain cities of the state of Rio de Janeiro that suffered the 2011 disaster, aiming at creating a device for online communication, associated with social cartography, seeking to establish a dialogue between the city management and citizens in a permanent and dynamic way. The device allows local needs to be visible for the creation of public policies. The implementation of the Extended Research Communities (Comunidades Ampliadas de Pesquisa), consisting of residents and their associations, participants of the municipal management, and researchers in a regime of ecology of knowledges, took place through cartographic workshops. The identification of the vulnerabilities and potentials of the communities, the emergence of memories and local knowledges allow the strengthening of community resilience. Therefore, the appraisal of the experience in the creation of social cartographies brings out the group's self-awareness. The mapping process demonstrated how unknown the territories are to the municipal management and even to their inhabitants.*

Key words *Community resilience, Social cartography, Disasters, Vulnerabilities*

Introduction

The year 2020 has come to an end indicating a set of challenges that we had not been prepared to face, despite the many indications of studies by the Intergovernmental Panel on Climate Change (IPCC) on the climate and the Bangkok Principles on health and disasters that warned us about the unfeasibility of the current development model and its effects on ways of life, considering the climate changes[1]. An association between inequalities, vulnerabilities and acceleration of environmental changes, expressed as disasters, forced us to face situations,of which the Covid-19 pandemic is the most emblematic case[2], with results not yet understood and that will demand from us the determination and political will to face their consequences. Something that these same studies highlighted: without the citizen organization ofterritories, the solutions are distant, abstract and immeasurable.

The International Strategy for Disaster Reduction (ISDR//UN) is a reference institution due to its production shared with most countries, pointing out what is currently a priority in this area. This can be already seen in its first documents, such as Living with Risk: A global review of disaster reduction initiatives[3], which evaluated the 10 years of the Yokohama Plan of Actions (1994) and prepared for the meeting that would generate the Hyogo Framework 2005-2015, the precursor of the current Sendai Framework 2015-2030[4].

In this document, the topic of building the resilience of communities is a central one, as it understands that disasters are more than temporary disruptions to be managed with a humanitarian response, only; and that their impacts are not reduced only by technical interventions, as they are closely related to sustainable development activities in the social, economic and environmental fields. In other words, in the same document, risk and vulnerability are two components of emergencies and disasters. And to prevent, respond to and rebuild, disaster reduction actions must be based on an ongoing assessment of vulnerability in the territory[3]. Resilience is, in general, understood as an interactive product of beliefs, attitudes, and behaviors experienced by people, which can help them to do better in situations of adversity and to recover more quickly[5].

Therefore, increasing resilience implies reducing the vulnerability of communities and societies, acting in the physical, social, economic, environmental and symbolic dimensions, aiming to prevent and mitigate the adverse effects of nat-

ural hazards, of environmental degradation and technological hazards.

However, we must not fail to highlight all the debates around the concept of resilience, which has its origin in the measurements of the steel alloy's capacity to return to its conditions without breaking, and which, by generalizing solutions, may underestimate the plasticity of the human adaptability to the environment. This is because, in an adverse situation, the most important thing is its own singularity, expressed in the combination of understanding the vulnerabilities and the support available in the territory[6]. Regarding this sense of plasticity, we resort to the concept of life as a "normative activity" in Canguilhem[7], by stating that human beings are defined by their ability to establish new standards of life, based on the constraints and possibilities imposed on them by the environment. That is, what may seem abnormal may indicate a new way of life. In his words:
As living beings move away from the specific type, are they abnormal beings who are endangering the specific form, or are they inventors on the way to new forms?[8] (p.110)

In countries such as Brazil, not considering the normative capacity of human beings can be dramatic and dangerous and can denaturalize what seems general and normal by multilateral documents, which are fundamental for overcoming emergencies and disasters. To understand how a certain territory was occupied and managed by a certain population is a condition to transform the vulnerabilization processes and support solutions that often gounimagined. An important line of thought in the sociology of Brazilian disasters that values the study of these processes, respecting the memory of the territories and the socio-historical nexus that shaped them[9]. Not viewing disasters as a natural fatality but indicating the possibility of writing a new story with the breadth of community knowledge and its resilience.

The same indication can be seen in the works[10] that define community resilience as the mobilization of resources and the population'ssolidarity capacities to promote physical and social transformations, also called the "protective shield"that emerges from the community's own living conditions and values and allows a metabolization of the negative event and the possibility of building from it.

Through the assessment of resilience in several communities that have suffered disasters, Ojeda[11] identified the pillars of community resilience: solidarity, state honesty, cultural identity, collective self-esteem and social humor. Very spe-

cial characteristics that require the experts' epistemological humility to be actively considered in standard socio-technical solution schemes.

For this purpose, both the experts and the same abovementioned multilateral documents agree that it is necessary to reduce the distance between management/experts and citizens. However, most of the proposed solutions end up giving the protagonism of this relationship to the management and expertsonly. More than a conscious action, they express a structured mode of our capitalist social organization. As Michel Callon[12] points out, the western management action model is based on what he calls double delegation. In it, citizens doubly delegate their day-to-day decisions to managers and experts, which ends up making localized community knowledge and solutions invisible, which are fundamental for dealing with the vulnerabilities that were already there before the disaster, due to the development model. A generalized model for all areas of society, based on the scientific administration of industrial work that isolates the worker from decisions on the factory floor. Management and experts control the production. In a certain territory, the dominant double delegation, especially in situations of health emergencies and disasters, tends not to favor community resilience movements. And that is why, according to Callon[12], that this model has been in crisis since the 1970s. To integrate community groups is a necessary path, as well asto combine the knowledge of management, experts and citizens, symmetrically, in order to transform it.

In this article, we deal with the experience of the project "Of Our Territory, We Know" (*De Nosso Território Sabemos Nós*), which was carried out in two communities in the mountain towns of the state of Rio de Janeiro that suffered the 2011 disaster, seeking to contribute to the overcoming of this double delegation. It is carried out through the development of a collaborative system, from an online communication device, based on social cartographies. The construction of interactive and participatory maps of the risks and vulnerabilities, needs and potentials of their territories, enablesthe local knowledge to be visible in the creation of public policies. This experience is based on the principle of better rebuilding, the fourth Sendai frameworkaxis of action, focusing on prevention.

Collaborative cartography systems

We repeat: it seems obvious, but through the organization of our society, it is not an easy task to reduce the distance between management and citizens, as the combination of management and experts, in double delegation, demobilizes the collectives and their possible resilience. The disaster of the mountain cities is also an example of this fact. In January 2011, these cities experienced an extreme climactic event considered the biggest Brazilian disaster of the combination of heavy rains, mass movement and overflowing rivers, which culminated in more than a thousand deaths[13]. Losses and damages in the region, according to the World Bank estimates, point to total costs amountingto one billion dollars. Among these costs, approximately 60% affected the public sector[14]. This was a disaster that, ten years later, has gone beyond the unfortunate memory and become a legacy that its citizens must deal with, full of organizational inefficiencies, management unpreparedness and administrative improbity and corruption. And that impacted and reorganized the entire national civil defense and protection system. Such a unique but also structural situation says more about our developmental model than it describes the adverse event itself. Health disasters and emergencies, understood as vulnerability processes, owe more to their socio-historical links than to their triggering events. A finding that also fits the current Covid-19 pandemic and that points, once again, to the urgent need for closer ties between management, experts and citizen participation in order to face their challenges, which often turn into the social disaffiliation of entire groups with their exclusion[15].

Based on this perspective, knowledge of the territory and the needs of the community are essential in combating the risks of disasters and health emergencies[16]. The knowledgesare normally dispersed across several systems, institutions, social actors and, locally, in the community. Strengthening the community movements is an essential condition for new knowledge production regimes to emerge, aiming to produce new ways of life[7], not ignoring the inertia that the double delegation causes in the communities.

To strengthen something, it is necessary to know, to map risks and vulnerabilities based on those who experience the situations. Historically, in the 1970s, an important experience was carried out by Oddone et al.[17], known as the Italian Worker Model (IWM), in the struggle for workers' health.

For Oddone[18] it was clear that workers develop knowledge based on their work experience without often realizing, appraising, enhancing or managing to transmit this experience. Thus, he sought to develop methods that could help both in the formalization and in the transmission of

the so-called working experience. It is in this sense that he introduces the idea of an *expanded scientific community*, based on the idea of harmfulness limits, which called into question the interpretation of the results of scientific analysis, which would be accepted only after consensual validation by the homogeneous group.

The creation of risk maps becomes the basis for the construction of a concrete and systematically sustained demand agenda. The fundamental methodological objective of this proposal is to introduce the worker's subjective perception as a criterion for assessing harmfulness, without delegating these criteria exclusively to experts. It turns into a protagonist the group that lives subjected to the same harmfulness and that has accumulated a lay epidemiological knowledge about the environment regarding the relationship between the environment and the suffering and illnesses that affect the group, which becomes aware of the cultural scope of their experience and recognize themselves as a homogeneous group.

The experience of social cartographies follows the same direction. According to Harley[19], the official cartography has always been a type of knowledge and a type of power. The cartographer, either consciously or not, does not only reproduce the territory in an abstract sense, but also the territorial imperatives of a political system. Due to the selectiveness of their content and their symbols and styles of representation, maps are a means of imagining, articulating and structuring the world. By accepting these premises, it becomes easier to understand the extent to which they submit themselves to the manipulation by those who have the power in society. Cartographic bases and maps are usually produced by specialized technicians, under the interest of public and private institutions in double delegation with the management.

Allowing the communities themselves to produce their own cartographies is already a counter-hegemonic action. Several mapping initiatives that propose the inclusion of local populations in the map production processes have spread all over the world. The concept of social cartography emerged in the early 1990s with 'New Amazon Social Cartography Project' (*Projeto Nova Cartografia Social da Amazônia*). With the support of unions, associations, movements, and cooperatives, some groups have used the social map as a way to assert their rights in different contexts and see in cartography a way to expose their territorialization processes and their identity[20].

Depending on the place, cartography can serve many purposes of community organization. In some, it will contribute to direct political incidence and will strengthen collective identities; and in others, it will make visible to the public the phenomena experienced by certain social groups and collectives. Cartography, thus, brings people together and leads them to structure narratives of community life that unfolds in the territories, helping to see the relationships of this immense associative network of which we are part, and which is currently being transformed[21].

Therefore, the social map only exists from the effective and unconditional participation of the involved population[22]. This characteristic of social mapping enhances another, often forgotten mapping characteristic, which is not something closed, but in a permanent process of construction. To ensure the expression of this potential currently has one more ally, which are online collaborative systems.

According to Souza et al.[23], the success of Collaborative Systems involves changes in behavior and culture, by inducing people to share and collaborate, making them active in the process of generating, receiving and transmitting knowledge. In a context of community of practice, made possible by technological artifacts, it allows connecting people, strengthens and creates a sense of group, allowing a collective, explicit, public, relevant, orderly and clear learning to appear.

Given the potential of the available technologies, the interaction between citizens and governmental and/or non-governmental institutions, the creation of services of great relevance and representativeness for the citizen is enhanced and enabled[24].

From this perspective, we seek to create an online communication device, associated with social cartography, to establish a dialogue between management/academy/citizens in a permanent and dynamic way.

Methodological trajectory

The methodological trajectory presented herein is the result of the research group's long journey with and in the territories affected by the 2011 disaster. Its references comprise the production of the documentary "*11.01.2011 ExperiênciaLimite*" (https://www.youtube.com/watch?v=7S-fH7VBitbE) and the performance of the 1st International Seminar on the Denaturalization of Disasters-2015[25]. This experience opened space for a closer contact with these territories in 2019, with the construction of social cartographies in

two communities that were the most affected – Caleme, in Teresópolis and Córrego D'Antas, in Nova Friburgo. The disaster disorganized these territories, with material and symbolic losses, which bear their scars to this day, in the walls of houses, in mountain faults, in the ruins of condemned buildings, in the voids left by displaced or lost families. Evidence that has been scattered throughout the territory and are present in the memories of the residents that must be considered and respected, for the strengthening of these communities.

To do so, we follow the successful experience of the IWM[17] with every discussion revisited by Yves Schwartz[26] through the Three Poles Dynamic Device (DD3P, *Dispositivo Dinâmico a Três Polos*) or Extended Research Community (CAP, *Comunidade Ampliada de Pesquisa*), as it is called by Brazilian researchers[27].

The DD3P is a cooperative work and training device that places three different poles into a dialogue: organized knowledges or disciplines (managers, experts and academics); the forces of convening and validation (regarding the knowledges invested in the citizen activity itself); regulated by the third pole of ethical/epistemic requirements (which seeks dialogical symmetry between these knowledges, both local territorial ones and disciplinary knowledge)[26].

We add to our toolbox the idea of the ecology of knowledges developed by Boaventura Santos[28], a collective process of knowledge production that aims at reinforcing the struggles for social emancipation. A strategy to face the conditions of uncertainty of our time, so as not to waste available social experiences or classify emerging social experiences as impossible ones[29].

The launching of the project and explanation of its objectives was held at a first meeting in Córrego D'Antas; this presentation took place during a regular meeting of the residents' association managing group. In Caleme, the project was presented during the opening ceremony of the association's newly elected board and was attended by more than 40 people. The communities supported the implementation of the project and the Residents' Associations approved the proposal and provided a space for the meetings to take place.

The construction of CAPs in each territory took place under different circumstances, and four workshops were held for the development of social cartographies, always on Saturdays, once a month (August to November 2019). The association of Córrego D'Antas has its own headquarters, while Caleme uses the attached space of the

main Catholic church in the neighborhood to hold its meetings. In advance, the meetings were broadcast in the community through posters and direct contacts with leaders to disseminate the information. On average twenty people participated, including residents, professionals linked to Municipal Health, Civil Defense, Social and Environment Development Departments, in addition to the group of researchers. The workshops started with a dynamic circle and, at the end of the meeting, they turned to the circle for the closure (Chart 1).

With an average duration of four hours, most of the workshop time was used to discuss the community's vulnerabilities and potentials, based on previously produced and modified maps. The maps for the first workshop were produced by the team. The later ones were already the result of shared work.

The participants signed the Free and Informed Consent (FIC) forms approved by the Research Ethics Committee of Escola Nacional de Saúde Pública (ENSP/Fiocruz).

Results and discussion

The Caleme community is located in the ecological corridor that connects *Parque Nacional da Serra dos Órgãos* and *Parque Natural Municipal Montanhas de Teresópolis*, covering 0.874 km². There are about 5,000 residents in this dispersion and movement flow to maintain biodiversity. Their houses are distributed among the slopes and banks of the Imbuí River. The landscape has been changing since the disaster in January 2011; however, one can still see the remains of rubble and condemned houses, which are being used as the final waste dumping space, promoting the infestation of rats and burning of materials.

The community of Córrego D'Antas, has approximately 19km² and is located in the planning territorial unit, the Bengalas river basin. There are an estimated 5,000 inhabitants, distributed along the margins of RJ-130 road that connects Nova Friburgo to Teresópolis, along the D'Antas stream banks and the slopes of the Special Environmental Interest Zones (*Zonas de Especial Interesse Ambiental* - ZEIA), Controlled Urban Zone (*Zona Urbana Controlada* - ZUC) and Oriented Expansion Zones (*Zonas de Expansão Orientada* - ZEO).

The construction of social cartographies carried out in the workshops with residents of the Caleme and Córrego D'Antas neighborhoods brought out the memories of those affected by the 2011 tragedy. The marks on the collec-

Chart 1. Dynamics of Cartographic Workshops.

Dynamics	Cartographic workshops			
	First - august	Second - september	Third - october	Fourth - november
Name	Wish tree	Mural of intentions	Community web	Feeling that I bring
Materiais	Dry tree branch Colored ribbons Markers	Brown paper Magazine clippings with pictures and words Scissors, glue, markers	Roll of string	
Description	Participants sitting in a circle are asked to write one wish (or more) on the ribbons. Afterwards, each participant states their wish, stands up and ties their ribbon on the branch arranged in the center of the circle.	Creation of a mural to represent the community through the choice of words, phrases and images available in the center of the circle or created/drawn on the spot.	For the construction of the web, the participants forming a circle and standing, choose a member to throw the roll of string at and so on. The former held a piece of the string, so that, in the end, the web was created. Before throwing the roll, each member spoke about an element of nature or society to be a guardian of: animals, water, nature, sun, waterfall, people, street, trees, families, etc.; At the end the web is undone, each participant returns the roll and repeats the partner's guardian.	Sitting in a circle, each participant is asked to declare and explain the feeling they brought to the meeting.

Source: Author's elaboration.

tive identity resulting from lost lives, destroyed houses, and state initiatives of territory requalification, demolishing homes and rebuilding homes in other locations, shatteredthe feeling of belonging to the place[30]. A situation that in many cases meant their deterritorialization[31]. However, memories remain of considerable resistance and reconstruction. Therefore, the project had excellent acceptance and saw the engagement of different groups, establishing an agenda for the cartographic workshops.

First cartographic workshop

In the first workshop for the creation of community cartography (Córrego D'Antas-08/10, Caleme-08/31), the presentation dynamic was conducted by the tree of desires. On a dry tree branch, little by little, the circle participants wrote on ribbons a wish for themselves and for the community, from the perspective of the common good.

The community of Caleme delineated its fundamental issues: urban mobility; garbage disposal; more polluted river areas; streets with open sewers; demarcation of support points and warning siren locations; and demarcation of environmental protection areas. In this community, the residents presented the needs of the neighborhood: drugstore, community vegetable garden, more supermarkets, paved streets and inclusion of bus stops and public lighting.

In Córrego D'Antas, the demarcations turned to educational institutions; health institutions; the factories in the neighborhood; irregular garbage disposal sites and saturated city landfill– located in the neighborhood, where slurry is dumped into the river; the residents highlighted the inexistence of garbage collection systems in the highest parts of the neighborhood, which results in the burning of garbage; they also highlighted the lack of leisure and cultural areas.

By having contact with the maps prepared by the team and project partners based on the collected data, they were able to validate the information and add what they considered relevant. They located the previously discussed problems on the maps. However, they asked for maps in which they could better recognize the territory. The following are excerpts from the speeches shared in the group.

Empathy and common value, I think that sometimes the difficulty of the empathy barrier is exactly because we understand that our value is

greater and stronger than the value of the other. We ignore that there is a value that is neither mine nor the other's, but that it is a common value. (Córrego D'Antas resident)

After everyone placed the ribbons with the words, I was thinking, there is a word that gives strength to all the others that we put there, the accomplishment, that these words and feelings come true. (Caleme resident)

Second cartographic workshop

The second cartographic workshop (Córrego D'Antas-09/21, Caleme-09/28) started with the elaboration of a collectively constructed mural, from which each participant could choose an image, phrase and/or word, to think about the community'scommon good. This collective mural paved the way to contemplate the needs of the community on their respective maps, through the identification and debates about their issues.

In the community of Córrego D'Antas, the residents highlighted: the reduction in the size of the river that cuts through the neighborhood – sewers that go straight into the river; places that need containment and paving work; the dumping of pesticides in the river – it is possible to see the color of the water in the river change. And they proposed: the construction of a sewage treatment plant; the creationof a park project around the river; and they requested a new risk map for the neighborhood by the civil defense.

In Caleme, the actions on the maps included the correction and validation of captions, and demarcation: of areas with garbage and lack of sewage disposal; of polluted places that contaminate the neighborhood's springs; areas at risk of landslides and locations that require containment works; and support points in case of emergency. The main proposals for improvements in the neighborhood included: the need for a health center and the construction of leisure areas, especially for children.

The maps were completely reconstructed in the two communities. And the team considered the possibility of making a record based on drone photographs.

I chose history because at this moment we are part of Caleme's history and we also need to rescue our history, I chose this picture because I remember the Valley of the Eucalyptus, we need to preserve it, so that people can be part of this history. (Caleme resident)

I'm going to write a word that represents a lot the moment we're living, which is an African philosophy:'ubuntu', which means: I am what I am

thanks to what we are; which means that the community only grows from the moment that it understands that together we are stronger. (Córrego D'Antas resident)

Third cartographic workshop

The dynamics of the web of life opened the third cartographic workshop in the communities (Caleme-10/19, Córrego D'Antas-10/26). Each participant introduced themselves and chose a representation/element to be its guardian. After theyformed the web of string among them, they brought out feelings experienced with the 2011 rains. They perceived how connected they were, the importance of care and how theywere positively dependent on each other.

In Caleme, the participants looked over the maps to validate previous data and add captions, focusing on places with possible landslides and garbage disposal; demarcation of areas that have difficult access; on streets without asphalt and without lighting; the proposal of new escape routes in case of emergencies; suggestions for new support points and locations for the installation of a health unit. Irregular constructions in an environmental reserve area were pointed out; and it was decided to represent the river in red color with black lines indicating the places with greater vulnerability when it rains.

In Córrego D'Antas, the captions were corrected and validated. A discussion about the location of the day care center on the highway and the need for adequate road signs; lack of an adequate sports court; demarcation of streets with paving problems; the Evangelical Churches and the Spiritist Center; garbage disposal points; with the warning about the danger of a car depot. The proposal was made to call the leaders from the locations –*Sapolândia* and *Dois Esquilos* – that were without representation, to add information to the map.

So, we are connected and taking care of each other. To be here today, one depends on the other, so thinking about working with a map, working with each other, with a friend, with a neighbor, knowing this balance, of respect and love for everything around us, this is the message of this web. (Caleme resident)

The territory is made up of people and things, so it has everything to do with the moon, relationships and the neighborhood. In relation to all of this, Córrego Dantas itself is a good example of resilience and a relationship that after the disaster was very good, regardingthe organization, structuring and acting politically. (Córrego D'Antas resident)

In both communities, to overcome the lack of Google Maps compliance, the project team presented maps made based on the drone images, providing a reliable view of the territory. These maps allowed the communities to recognize themselves better and made it easier to consolidate the information that was gathered since the first meeting.

Fourth cartographic workshop

In this last workshop (Caleme-11/16, Córrego D'Antas-11/30) a presentation was made with a synthesis-film of all the discussions and photos of the meetings. The short film starts with the image of the planet, closing up until it focuses on the image of the community. The final map of each community was affixed on the wall for all to see. During the dynamics, in a circle, each participant can voice the feelings that animated them, after experiencing the memories of the other meetings.

In Caleme, the consolidated community map was presented and once again the need for the implementation of a health unit emerged. They took advantage of the presence of the municipal health secretary at the meeting, who vowed to make it a reality. The representative of the civil defense secretariat presented the proposal to construct a census of the city's communities and proposed to discuss the actions that the project will develop; there was also a great discussion about the sustainable use of garbage, recycling workshops. The developments of the project such as the living community census and the construction of the neighborhoodmemory were also presented.

In Córrego D'Antas, during the presentation of the consolidated community map, discussions were held on the issue of garbage disposal and types of recyclable use; communication channels, such as churches, to mobilize young people and people to participate in the project and actions such as the census and recording of the neighborhood's memory.

When we arrived and some people looked at the map, I almost cried, because it wasn't a picture of anything, looking at the photos... I would like to make it clear that this information was placed at the first moment and every time we meet, we have more things to say and every moment we live, it complements each other and now we will have the app. (Technician - Social Development Secretariat, Caleme).

I think [the app] would be important because there are holes in the neighborhood, sometimes it needs asphalt, I think of all these problems, like their issue, on top ofthe bus. So, I think it's import- *ant, because through the app you can take pictures immediately and you already know that there is a problem in that place.* (Caleme resident)

In these last cartography workshops, new links were woven in the network of meetings and appreciation of experiences and knowledges with other local actors, such as the group from *Parque do Parnaso*. Cartography contributes to the emergence of the group's self-awareness, as indicated by Gorayeb and Meireles[22], as well as the construction and development of their own identities.

Following and to finalize these meetings, the planning of the application was presented, and possibilities of its functions and subsequent actions were discussed.

The application guaranteeing the dynamism of the CAPs

The developed application, which is already being tested, allows a person from the community to provide a report of their needs, criticisms, or suggestions, and can even send a photograph, and after approval of the content by the residents' association, this report becomes visible and available for other people in the community to interact with the report, being able to approve (like) or disapprove (unlike), or being able to post comments. The proposed solution consequently produces a level of memory of the discussions, generating accumulated knowledge in a democratic process (Figure 1), which favors the deliberation of the residents'association to turn a report into a collective demand. After confirming the association of the report as a collective demand, it is informed and sent to the representative of the municipal government for their knowledge of a demand by the community.

Regarding the processes, we can detail the several interfaces of the residents to send reports, and the details can be seen in Figure 2.

From this perspective, the solution aims to strengthen deliberative democracy, but also a substantive one, as it is based on data on the needs reported by the population, thus facilitating transparency for political and deliberative decisions by the residents' associations to which they belong. The residents' association, in turn, will bring together and support the demands of the population, which, through the tool, will cause the municipal government to be responsible for answering to such demands.

It is essential, at this stage, the construction of a common language to consolidate the CAPs and implement the application. A new knowl-

edge that promotes mutual and formative development of these territory protagonists, of technicians and municipal managers and the researchers themselves, based on the acknowledgement of the other and of their knowledges as legitimate ones, as Boaventura Santos points out, in an ecology of knowledges[29].

The experience of building the CAPs has the potential to aggregate other devices that seek to break with the legacy of vulnerability and the building of a new, adherent, territorial, community knowledge. Therefore, these movements reaffirm the concept of life as a normative activity in Canguilhem[8], by saying that human beings are defined by their ability to establish new standards of life, based on the constraints and possibilities imposed on them by the environment.

Final considerations

By appraising the experiences, through the cartographic workshops, from the perspective of transforming the ways of living, we envision, together with the protagonists and partners of the project, the possibility of its expansion to other communities, establishing a network. The challenge of its scalability depends on greater engagement with the municipal management and the engagement of other locations. Partnerships with research and teaching institutions are promising.

The identification of vulnerabilities is a way to practice community resilience. In honor of the cities that hosted the world forums on Risk and Disaster Reduction, all in Japan, we recall a Japanese technique for restoring damaged and cracked ceramics. *Kintsugi* is a technique for restoring ceramics by mixing lacquer and powdered gold, often rendering the restored object more valuable and more resistant than before. The workshops of the social cartographies demonstrated how the territories are unknown for the municipal administration and even its residents. In the horizon of permanent uncertainty in which we live, the assertion that the environment is always disloyal seems to us an uncomfortable truth that we cannot avoid. We have to transform this knowledge into an advantage. It seems that this is exactly what we need, abetter restoration based on the territories to face the world that lies ahead.

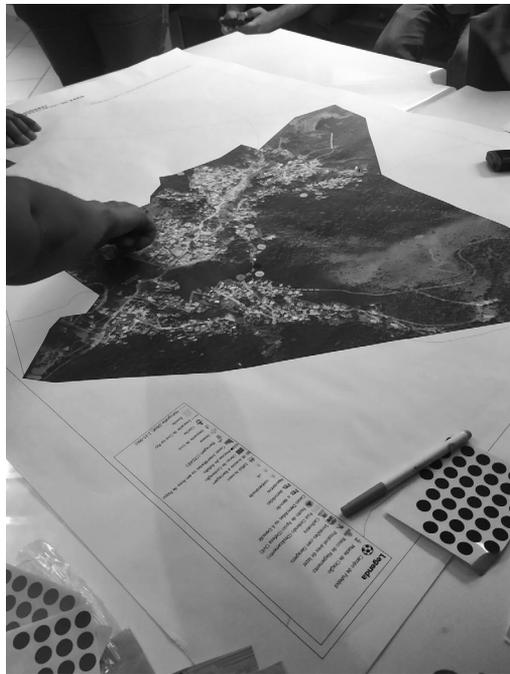We hope that the experience shared here goes towards this direction.

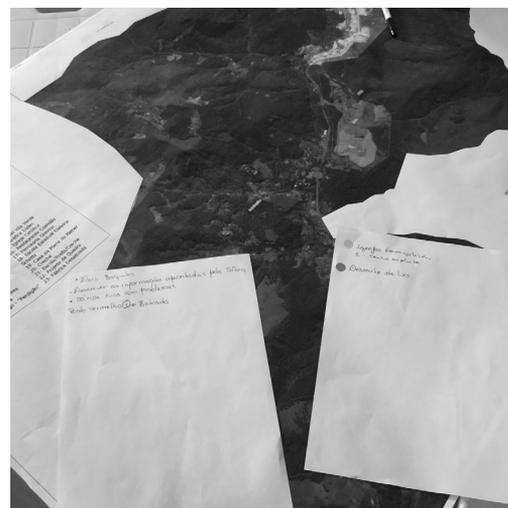
Figure 1. Caleme Map.

Source: From authors.

Figure 2. Córrego D'Antas Map.

Source: From authors.

Figure 3. Democratic construction process.
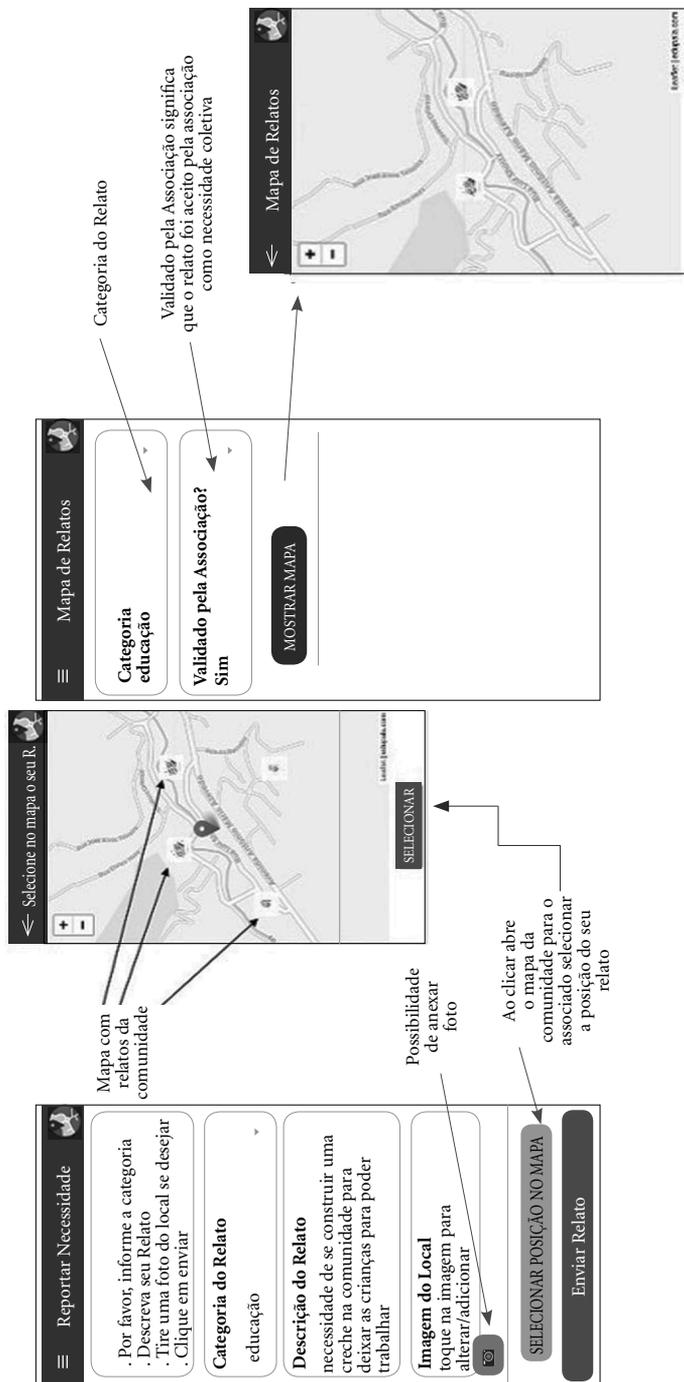
Source: Developed by the Authors

Figure 4. Report submission template.

Source: Developed by the authors.

Collaborations

SS Oliveira, S Portella, CT Yoshikawa, DC Lobosco, LF Dias e TC Oliveira effectively contributed to the conception, planning and writing of the manuscript. SS Oliveira and S Portella carried out the review and approval of the final version of the manuscript.

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