

The Rio Doce Mining Disaster in Brazil:

between policies of reparation and the politics of affectations*

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Abstract

This article analyses the policies of affectations in the context of the disaster which occurred in late 2015, when an iron ore tailings dam ruptured, affecting thousands of families in the Rio Doce River Valley, in the southeast of Brazil. The paper discusses the challenges faced by victims of the disaster, given that the 'affected person' as a social subject goes through a dramatic process of forced sociability, forged in political processes and bureaucratic demands which are alien to her/his world. As a consequence, the claims of victims are transmuted by the rationalities and techniques of corporate management, therefore disabled and re-codified by taxonomies which define forms of damage reparations, as well as modes of reconstruction of their way of life. From an anthropological perspective, we examine the struggle between the objectification imposed by the policy of affectation and the political subjectivation of actors compulsorily brought to contentious settings over the control of their own destiny.

Key words: Mining; disaster; conflict; affected person.

O desastre da mineração no Rio Doce, Brasil: entre a gestão da crise e a política das afetações

Resumo

O artigo discute os aspectos da política das afetações e suas consequências tomando como caso etnográfico o desastre ocorrido no final de 2015, quando uma barragem de rejeitos de minério de ferro se rompeu, afetando milhares de famílias na bacia do Rio Doce, sudeste do Brasil. O propósito é examinar os desafios colocados às vítimas do desastre, visto que o sujeito social 'atingido' passa por um processo dramático de sociabilidade forçada, forjada nos processos políticos e nas demandas burocráticas que lhe são alheios. Desse modo, suas reivindicações são transmutadas pelas racionalidades e técnicas do gerir corporativo, tolhidas e recodificadas pelas taxonomias que definem as formas de reparação dos danos, bem como os modos de reconstrução do seu viver. Trava-se uma luta entre a objetivação imposta pela política das afetações e a subjetivação política de atores compulsoriamente trazidos aos cenários de disputa sobre o controle de seu próprio destino.

Palavras-chave: mineração; desastre; conflito; atingido.

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Introduction

“It’s so difficult, this task of mine, our task: to learn how to be an affected person.

What do you mean?

We need to behave like affected people.

Is there a particular way for affected people to behave?

I don’t know.

I know that we need to learn how to live together like that.

That makes me think about rights, meetings, assemblies, agreements, foundation, reconstruction, resettlement...

Concepts which make me confused. Confusion which makes it difficult to understand simple words like: ask, require, negotiate, fight, right, wrong.

That’s why I cry. I feel affected by not knowing how to be an affected person”.

(Angelica Peixoto. **Learning how to be an affected person.** *Jornal A Sirene*, September 2016: 7. Written with the assistance of Ane Souza, Bárbara Torisu, Elizabete Tavares, Fernanda Tropicia, MAB e William Menezes).

The excerpt of the poem written by Angelica, teacher and resident of Paracatu, small rural village destroyed by the disaster which resulted from the rupture of an iron ore tailings dam in Mariana, Brazil, expresses the anguish suffered by social subjects who are faced, above all, with a novel and alien political and bureaucratic reality. Regardless of the disaster in itself, which suddenly ruined their lives, the process of becoming recognized as subjects of rights affected in this catastrophic and critical context is prolonged as a chronic crisis which denounces the unnatural character of ‘being’ and of ‘becoming an affected person’. In fact, upon de-naturalizing the idea of affected person, the poem lays bare the complex process that comprises the construction of consciousness and of the ‘crusade’ which involves involuntary insertion into a context of bureaucratic management. It stresses the need of learning a political practice, the determinations and disciplines of this same practice which is part of the pursuit of rights. The ‘affected person’, as social subject, in addition to being displaced physically and materially, is, in the end, a socially and culturally displaced person. A subject who goes through a dramatic process of forced sociability, forged in the political processes and bureaucratic demands which are alien to her/him. In this way, claims of the victims are transmuted by the rationalities and techniques of corporate management, disabled and re-codified in the “universalizing professional languages of complaint and restitution” (Das; Kleinman; Lock 1996) which define forms of reparation of damages imputed, as well as modes of reconstructing their way of life. It is the story of a struggle between the objectification imposed by the policy of affectation and the political subjectivation of actors involuntarily brought to contentious settings over the control of their own destiny.

The mining dam which ruptured in November 2015 was owned by the Samarco Mining, Inc. Company, subsidiary of two international mining giants: Vale S. A. and BHP Billiton Brasil Ltda. Fifty million cubic meters of mineral waste was carried to the Rio Doce, one of the most important rivers of southeast Brazil, traveling approximately 600 km to the mouth of the Atlantic Ocean. Nineteen people were killed immediately, hundreds of dwellings were destroyed, and other hundreds of riverine communities faced major losses to productive activities. The compromising of life of the Rio Doce as far as the coastline of Espírito Santo State brought significant damage to the water quality of that basin, source of drinking water and food production for millions of inhabitants.

Figure 1 – Course of mineral tailings of the Fundão Dam from the municipality of Mariana, Minas Gerais State, to the mouth of the Atlantic Ocean, in Espírito Santo State (Map drawn by Max Vasconcelos, 2017).



In addition to immediate extensive material losses and serious damage to the health and life of these populations, the annihilation of their territories must be emphasized. The latter constitute the basis of their social, cultural and economic reproduction and are set in specific socio-ecological conditions which were destroyed by the disaster.

Following the rupture of the dam, Bento Rodrigues and Paracatu de Baixo, rural villages immediately downstream, were completely devastated by the mud. One of the first measures of assistance to the victims was housing in a multi-sport gymnasium in the city of Mariana, followed by a rapid transfer to hotels in the city. Despite this swift measure of the Civil Defense team, the victims immediately became the object of various levels of government which, upon framing the situation as one of environmental conflict, presented themselves as mediators between the company and the affected people. Within this policy, “representative commissions” of the affected people were formed, and soon after, a series of public meetings took place.

Figure 2 – Meetings between the companies and affected people:

- 1) Meeting about reconstruction of Bento Rodrigues, March 10, 2016;
- 2) Meeting to present division of land where resettlement of Bento Rodrigues would be built, January 20, 2017. Photos by Marcos Zucarelli.



At this initial stage, we observed that despite originating from a rural context, the sociological universe of the affected people was quite varied. Many were not familiar with the procedures, spaces, institutions and languages of ‘representation’ and ‘participation’, including the meaning of a ‘commission’. Others expressed reluctance to have to deal with external intermediaries and ‘fear of being represented’ by those who proposed solutions unrealistic to their way of life (Zhou et al. 2016a; 2016b). As the above poem suggests, the process of ‘learning to be an affected person’ became painful and distressing because it was permeated with formal rules, lexicon, provisions and expectations which were pre-defined by external agents, distant from the daily life of those who suddenly were transformed into victims. Thus, concurrent with the ruptures and destabilization produced by the catastrophic event, there was an unnatural need to learn how to deal with the bureaucratic, administrative and legal novelties, in addition to the existence of harassment, hearsay, rumors, suspicions, controversies, fears, slander, fights and crises, problems not uncommon to both disasters and representative political organisms.

The inhabitants of those villages of the municipality of Mariana which were immediately affected, namely: Bento Rodrigues, Camargos, Bicas, Ponte do Gama, Paracatu de Cima, Paracatu de Baixo, Pedras and Campinas, as well as Barretos and Gesteira, which are part of Barra Longa, municipality whose urban center was also partially razed by the mud tailings, struggle for their rights and the reestablishment of their living conditions. However they encounter difficulties in dealing with the terminology and format of reparation policies, as well as in relation to the organizational demands placed on them by the State and by companies which are responsible for the disaster. The means, the jargon, the temporality of the standardized and institutionalized channels of ‘participation’ reveal not only the limits, but also the

pernicious effects of the management of damage and suffering. The diverse experiences and languages of the affected people are transformed into fixed attributes apt to be instantly grasped, measured and placed in standardized and numerical registers of instruments such as the 'socioeconomic cadastral survey' of the victims and the 'matrix of losses and damages'.

In this manner, living through the disaster as an 'affected person' also comprises a long-lasting experience of strange jargon, spaces and times exemplified by the submission to the rental housing and the 'benefit card' furnished by the companies,¹ by the subjection to the deliberative power of juridical and corporate jurisdictions and, above all, by the waiting, which constitutes a state of permanent anguish and frustration.

In short, the disasters entail far more than a set of material damages which can be measured and solved by means of financial compensations. The process of rehabilitation, itself, can be replete with varied dimensions of violence which demean even more the living conditions and autonomy of those who suffer losses. The disasters, therefore, are not limited to the critical catastrophic event, but rather unfold in long-lasting processes of social crisis, frequently intensified by institutional directives, which have the effect of perpetuating the social suffering.

The Environmental Studies Group of the Federal University of Minas Gerais (GESTA-UFMG) has monitored this case since the dam ruptured, analyzing, among other activities, the policies and politics of affectations. These comprise both the administrative codifications as well as the actions which they produce and are adopted by the State and the companies responsible for the disaster. In this article, we focus on the Loss Register Survey (*Cadastro de Atingidos*) designed by the companies to identify victims and their losses. First, we resume arguments raised in Zhouri et al. (2016a; 2016b) which point to the production of social suffering and the perpetuation of socio-environmental injustices under the mantle of mitigation, mediation and accord. These, we stress, impose excluding procedures, the effect of which is the flexibilization of rights already guaranteed by the Brazilian Federal Constitution. Continuing that discussion, and informed by new ethnographic data, we argue that the management of the crisis on the basis of terms and instruments typical to environmental assessment processes causes not only the aggravation of vulnerabilities unleashed by the disaster, but also marginalizes forms of mobilization of the affected people themselves, consequently reducing possibilities of social participation. In the final section, our analysis of the Loss Register Survey proposed by the companies to identify victims and damages seeks to demonstrate the confluence between the control that requires a typical behavior as 'affected person' - *Is there a particular way for affected people to behave?*, asks the poem - and the equally disciplining control which is obtained by the patterning power of numbers (Scott 1998; Appadurai 2005).

¹ November 17, 2015 was the beginning of a routine of meetings in the city of Mariana between the State Public Ministry, Samarco and representatives of affected inhabitants to deal with affairs said to be of an emergency nature: "the leaving of inhabitants from hotels, criteria for priority of assistance, values and viabilization of funds for maintenance, among others" (Zucarelli 2016: 323). After much resistance from the companies (Samarco, Vale, and BHP), the District judge ratified the agreement between the parties in the first public hearing of conciliation conducted in the Mariana Courthouse on December 23, 2015. Among the judicial decisions was that Samarco would be responsible for payment of a minimum wage for each person who lost income in the nuclear family, with an added 20% per dependent, plus the relative value of a monthly subsistence basket of food, amounts to be deposited in a bank account which could be accessed by use of a corporate card.

Figure 3 – Researchers from GESTA-UFMG work in collaboration with affected people from Paracatu on a map of the community destroyed by the disaster, 19/02/2017. Photo: Marcos Zucarelli.



Framing the disaster as an ‘environmental conflict’: outcome policies and consequences²

The growth of investments in primary mineral extraction in Minas Gerais for export has resulted in the increase of social and environmental conflicts (Zhourri 2014). The tendency is for this scenario to expand further in the context of the flexibilization of environmental licensing regulations occurring at the state and federal levels.³ Furthermore, it is a fact that state government policy in recent years has been responsible for the scrapping of governmental agencies and precariousness of working conditions of environmental personnel, thereby making it unlikely that these agencies can effectively carry out functions prescribed in new legislation.

In effect, a worrisome flexibilization in the monitoring of planning, construction and operation of developmental projects has resulted in unbearable risks, which extrapolate the sites of the mining projects. The rupture of the Fundão tailings dam was a frightening example of this critical context, but is far from being an isolated case. Since 1986, the rupture of six dams in Minas Gerais had already resulted in a total of 16 deaths, thousands of people displaced and serious problems of drinking water supplies in municipalities situated along the affected rivers (Oliveira 2015).

The cases illustrate negligence of business agents and of public authorities with both the enterprises and the management of the disasters caused by them (Zhourri et al. 2016a and 2016b). The shifting of the

² This section resumes part of the arguments already published in Zhourri et al. (2016a) and Zhourri et al. (2016b).

³ See, for example, the Proposed Constitutional Amendment – PEC 65/2012, approved in April, 2016 by the Commission on Constitution, Justice and Citizenship of the Senate; the discussion about the New Mining Code proposed by the Ministry of Mines and Energy; the Proposed Legislation 654/2015; State Law 21.972/2016, approved by the Legislative Assembly of Minas Gerais in January, 2016 and Decree 47.137 of January, 2017, in which the Governor of the State of Minas Gerais, under the pretext of providing agility to licensing processes, sets deadlines for responses from environmental offices to studies submitted by companies and facilitates environmental norms so that companies could request, simultaneously, two and/or three required licenses. In the same vein, another measure imposed by this Decree is the disengagement of the requirement for technical opinions of intervening bodies, such as, for example, the Institute for National Historical and Artistic Heritage (IPHAN).

administration of these disasters – from the sphere of criminal investigation and judicial process to the axis of managerial treatment of ‘environmental conflicts’ or ‘socio-environmental conflicts’ – discloses diverse technologies of dispute prevention, with emphasis on agreements oriented towards the construction of would-be pacts between potentially litigating parties.

In the case of the Rio Doce disaster, the management of the crisis has mobilized a specific set of devices, such as the so-called negotiation tables and signing of Terms of Adjustment of Conduct (TAC).⁴ Such devices are mobilized under the pretext for swifter and more effective action, in contrast with an emphasis on punishments via the judicial process which attribute responsibility to corporate agents and compliance with demands of affected people. This contractual approach (Acselrad 2014) occurs, in fact, in detriment to spaces of participation of affected people and their supporters, segments which were not heard during the drafting, for example, of the Term of Transaction and Adjustment of Conduct – TTAC.⁵ Therefore, such policies characterize a mistake and a reduction: the mistake of classifying the disaster as a case of environmental conflict and the reduction of this latter to a sphere of negotiation between interested parties.

Environmental conflicts refer to situations of dispute about the appropriation of environmental resources and services in which an asymmetry in the access to natural conditions, as well as inequality of effluent disposal, are predominant. In addition, environmental conflicts are characterized by the irruption of collisions between distinct spatial practices which operate in the same territory or interconnected territories, leading to the collision and competition between diverse systems of use, control and signification of resources, in which the dispossession of local groups is not infrequent (Kirsch 2014). This is a process of political and symbolical struggles which comprises the meaning and fate of territories. In this perspective, two observations are important: first is that environmental conflicts are not limited to confrontation of interests between two or more litigating parties; nor are reduced to a controversy between subjects whose equivalent social positions results in equal conditions of negotiation. On the contrary, they constitute settings in which the agents involved occupy asymmetric positions, in which an unequal distribution of economic, political and symbolic capitals defines the power of action and of enunciation. Environmental conflicts arise from distinct modes of technical, economic, social and cultural appropriation of the material world (Zhourri & Laschefski 2010; Acselrad 2004). In this perspective, the disaster caused by Samarco was indeed the concrete manifestation of a threat posed by past conflicts. According to research carried out by Viana (2012), three years before the disaster, in Bento Rodrigues, locality closest to the mineral plant facilities and totally destroyed by the wave of mud, 68% of interviewees expressed fear in relation to the rupture of the dam, 94% complained about water pollution caused by Samarco’s operations and 64% feared that their properties could be expropriated by the company. With the rupture of the dam, those who were already affected by the operation of the mining complex suffered losses of life and deterioration of their health, in addition to permanent compromising of their territoriality. From *affected people* they came to be *victims*, with full right of compensation for material and moral damages. Placing them immediately at a negotiating table was an act which re-signified them as ‘interested party’, opening spaces for the offenders, Samarco/Vale/BHP Billiton, to also be re-signified in the same way.

⁴ In the weeks following the rupture of the tailings dam, Terms of Adjustment of Conduct and Preliminary Commitment were signed by the Federal Public Ministry and State Public Ministries of Minas Gerais and Espírito Santo establishing protective measures for employees of the company. Nevertheless, as will be discussed below, following the attempts made at the first meetings in November 2015, the companies refused to sign a Preliminary Commitment Term proposed by the State Public Ministry, which sought to guarantee rights related to compensation of victims and the reconstruction of the communities. This caused the opening of the first Public Civil Action against the firms in the District of Mariana. Recently, a new Preliminary Term of Adjustment of Conduct was ratified by the Federal Public Ministry and the companies.

⁵ Signed by the Federal Government, states of Minas Gerais and Espírito Santo and the companies Samarco/Vale/BHP Billiton Brasil in March 2016.

Victims and corporate agents, engaged in a type of bargaining of reparatory and compensatory measures, were placed in confrontation in purportedly symmetrical positions. Nevertheless, placed in a weakened stand for negotiation, affected people see their rights threatened by this technology of 'conflict resolution' which has frequently been adopted in Brazil.

Indeed, it is worth mentioning that, like Bento Rodrigues, innumerable riverine communities in the Rio Doce basin historically constituted their places and dwellings around the access to water. Only with the later insertion of the mining mega-entrepreneur in the territory were their respective places transformed into 'areas of risk', subject to catastrophes. A significant indication of this process is the estimate made by the State Environmental Agency that, of the 735 dams in Minas Gerais, 42 do not demonstrate guarantee of stability (FEAM 2015). In this context, the rupture of the Fundão Dam can be identified as a *sociotechnical disaster*. Different from the terminology predominantly employed in previous works (Zhourì 2016a, 2016b) – *technological disaster* – we adopt in this text the adjective 'sociotechnical' to emphasize a process set off by failures beyond one merely technical, thus relating it to failures of environmental governance that produced new patterns of vulnerability which, in fact, exposed the population to a situation of risk. The concept subscribes, then, to a sociological analysis of disasters which problematizes "*the socio-historical process in which the socio-spatial dynamic unfolds*" (Valencio 2014: 3633). Hence, far beyond the physical parameters and problems of prediction and quantification of the consequences, the central issue does not concern the technical reliability of the system. It rather comprises the geographic localization of dangerous installations, the amount of investments in security and prevention, the political decisions relative to the licensing of these structures and the technical choice of the dams as forms of waste disposal. These are the factors which engender the production and reproduction of environmental injustices. The risks of a possible rupture and the measures which should have been taken to avoid it were already known by environmental authorities.⁶ These conditions were assumed by companies and by the Brazilian State through their environmental agencies and instances of monitoring and investigation. Under the status of normality, they contributed to the naturalization of the threats and the manufacturing of susceptibilities.

At any rate, the rupture of the Fundão dam should be understood as a disaster rather than an environmental or social-environmental conflict. According to Valencio (2014), disasters are tragic collective events in which there are sudden and involuntary losses and damages which disorganize, in a multidimensional and severe manner, the *strategies, routines and way of life* of a given collectivity. This implies that a disaster should be "*considered a social crisis associated to a devastating physical occurrence and to a social time*" (Valencio 2014: 3633). Their explicative elements must be sought in a broader historical dimension which comprises the process of vulnerabilization as a sociopolitical relation.

The technologies of environmental conflict resolution applied to the socio-technical disaster of Samarco in the Rio Doce expose the constraints of institutions of defense of rights. These technologies were developed by international financial institutions and clearly shifts the approach concerned with rights to policies related to the adjustment of interests among parties (Zhourì 2015).

The policy assumed by these agents to deal with the disaster was guided by social technologies of mediation, based on the proposition and signing of terms of agreement between the State and the companies. Following the refusal of Samarco to sign a term of commitment which sought to guarantee reimbursement of the victims and rebuilding of their communities, the Public Ministry of Minas Gerais filed a public civil lawsuit with the courts of Mariana, in December 2015. In order to avoid juridical

⁶ In an investigation performed at the request of the Public Ministry of Minas Gerais, the Instituto Pristino had already alerted, in 2013, to the risk of collapse of the Fundão dam. The report recommended the periodic geotechnical and structural monitoring of the dykes and the dam; and highlighted the need for a contingency plan for situations of risk or accidents (Instituto Pristino 2013). Such recommendations contrast to the real non-existence, in the area of the enterprise, of even the most elementary system of sound alarm, the purpose of which is to alert the surrounding population in case of accident or aggravation of risks.

litigation, the judge of the judicial district decided to hold conciliation hearings, which had been suspended due to questioning of juridical jurisdiction. The result was the transference of the local lawsuit to the federal sphere. This fact occurred because the office of the General Counsel for the Federal Government, along with the companies and state governments involved, stitched together an extrajudicial term of accord which brought an end to a variety of regional public civil lawsuits against the defendant companies. On the basis of the ratification of the previously mentioned “Term of Transaction and Adjustment of Conduct (TTAC)”, reparation measures came to be administered by a private foundation named *Renova*. The measure was severely and publicly criticized by State and Federal Public Ministries, as well as by social movements and organizations, such as the National Committee in Defense of Territories Affected by Mining and the International Alliance of People Affected by Vale.⁷ Despite its criticisms of the accord, the Federal Public Ministry proposed to the defendant companies the Preliminary Term of Adjustment (TAP).⁸ The TAP signed in January, 2017, is intended to develop a negotiated proposal to resolve all civil demands involved in the lawsuit through negotiation of a final agreement among the parties. Measures foreseen by the TAP include the hiring, paid by the companies, of consultants and experts responsible for the development of evaluations and diagnoses concerning the environmental and social damages resulting from the disaster (see the final section of this article). In addition, this Preliminary Term foresees the holding of consultations with affected indigenous peoples and organization of public hearings with the objective of contemplating the participation of victims in the definition of the Final Term of Accord. The public hearings thus are conceived, at least until the present time, as the principal modality of participation recognized by the institutions involved in managing the crisis.

As previously emphasized (Zhouri et al. 2016a, 2016b), under the mantle of a *coercive harmony* (Nader 1990), the questioning of mining as a developmental project, of the multiplication and reproduction of risks involved in such economic activities, and of the responsibilities of corporative agents in the profusion of uncertainties and damages, becomes buried. In this context, the rights of victims to a just reparation and reconstruction of their way of life are subsumed to a managerial logic of identification, measurement and attribution of monetary value to losses, under the aegis of business, which consolidates a process of expropriation and perpetuation of social suffering, as shall be discussed below.

Social suffering as consequence of ‘conflict’ mediation policies

“Now I am sad, because you compared my situation to his”, says M., who had her dwelling completely devastated by the wave of tailings, and does not conceive her situation as similar to that of G., a small farmer whose house is in an area considered ‘remaining’ from the tailings. In order to arrive at his house, G. crosses the ruins of his community. Only debris remains of the old structures of houses, the school and bars located in the lower portion of the territory overwhelmed by the sheer volume of wastes. G. refuses to leave his house; he does not want to leave his livestock and his little farm to the care of the company. M. continues: “Look, his house is still standing, he has a place to plant, he has his domestic animals ... and me? What do I have?” She pauses, but then answers her own question in a somber tone: “I have the day and the night”.

⁷ In April 2016, the Federal Public Ministry (MPF) filed a Public Civil Lawsuit requesting the impugning of the TTAC and payment of more than US\$50 billion for the reparation of environmental and socioeconomic damages to the affected communities. Despite the judgment of the Lawsuit, the TTAC was ratified one week later, when the disaster had completed six months. Following a request by the MPF for annulment of the TTAC, the Supreme Court of Justice (STJ) issued a preliminary injunction suspending the agreement in July 1, 2016 (Zucarelli 2016).

⁸ The Term of Preliminary Adjustment was signed in January 18, 2017 by the MPF and the defendant companies. Its principal objective is to lead to the signing of a Final Term of Accord which substitutes the suspended TTAC. The TAP was partially ratified by the Judge of the 12th Federal District Court on March 16, 2017, still remaining the definition of the consulting company to be hired to provide technical assistance to the MPF in the development of the socioeconomic diagnosis.

Figure 4 - Debris of Paracatu, 22/07/2016. Photo: Marcos Zucarelli



It is voting day for the choice of the land where the resettlement will be planned for the community of Paracatu. P. cannot vote. According to the criteria decided, the people who live on surrounding small farms will not be part of the resettlement nucleus, therefore cannot vote. Walking through the same debris, P., who was removed from his house by Civil Defense and relocated on another small farm, asks one of the researchers of our team: *“I’m going to ask you because you have more experience with this business of tragedy and resettlement: - if I do not want to come back here, do I have to?, because I don’t want to come back...they were twenty-two years of wonderful living together and today I don’t want to come back here but...they can put me here or put me there, but Paracatu will never be the same. Paracatu doesn’t exist any more”*.

These statements reveal two recurrent themes in the narratives of the victims. The first is the devastating experience of the loss: Paracatu no longer exists, there is nothing but day and night. The frames of references which structured routines, the plans and the social organization itself, were abruptly and violently destroyed. Elements of collective identity, as well as those related to “territories of the self” (Goffman 2004) were profoundly affected. The second recurrent topic is related to the emergence of innumerable tensions and cleavages among the victims. In the terrain of uncertainty, insecurity and rumors of scarce resources of those responsible for the disaster, intra and interfamily conflicts flourish. In fact, despite resettlement and their geographic location, modes of imagination of the community of Paracatu are demonstrably different in the context of the disaster.

In the management of the crisis, knowledge with respect to losses and damages, their modalities and temporalities on the part of the institutions involved, imply the production of a taxonomy which aggravates tensions and consolidates fissures. Among the categories mobilized, there is a distinction proposed by the International Finance Corporation (IFC 2002) between *physical displacement* and *economic displacement*, based on the criterion of the loss of dwelling or loss of income as a result of the tragedy. This distinction was used as a baseline for scaling “affectations” in terms of gravity and degree of emergency, ordering the scene of the catastrophe into differentiated situations of intervention and institutional response (Zhou et al. 2016a; 2016b).

Later on, another distinction was added to that between physical displacement / economic displacement: the differentiation between dwellers/*veranistas*, that is, those who reside only in the village and those who have a double dwelling: simultaneously in the village and in the city, where they are sometimes obligated to work, returning to the village on weekends, for example. Among the various fragmentations produced by the policies of affectations developed by the companies and corroborated by the State, the category of '*veranista*' produces the re-signifying of dwellers and the staggering of rights, thus contributing to dismantle community life. In the case of Paracatu, it is being progressively divided into two nuclei: Upper Paracatu (formed by dairy producers, residents of small farms, dwellers of larger tracts of land on the periphery of the village) and Lower Paracatu (dwellers of the village's central area, in their majority smaller farmers who regularly provide their services to dwellers of the periphery, and whose smaller tracts of land allow for cultivation and animal raising on a smaller scale, that is, in the backyards). Currently, new divisions seem to appear, since the presence of small farmers of the periphery in the interior of the nucleus of the village (Lower Paracatu) is disseminated as a threat to conclusion of the resettlement, given the constraints provided by the size of land selected to accommodate all inhabitants of the community.

Therefore, in the context of the disaster, we observe that structures and terminologies employed by state and corporate institutions become alien instruments of intervention and management, capable of modulating in an unprecedented way the forms of imagination and construction of identities and feelings of belonging. Such process is perceived as an additional source of frustrations, resentments and losses: rupture of ties of confidence, friendships and circuits of reciprocity, not only by the physical dispersion of the community, but just as much by the emergence of new conflicts. In this manner, the chronic character of the disaster is revealed in the unfolding effects of the rupture of the dam, including the selection and operationalization of institutional directives designed to contain and manage the crisis. After reporting with disappointment the internal conflicts in her own family, P. affirms: "*that mud is still doing damage*".

The damages refer less to the spatiality of the mud than to the social implications and effects of the modalities of institutional treatment of the disaster. This includes terminologies such as 'physically displaced / economically displaced' or 'double dwelling', the choice of methods and instruments of identification and verification of damages, and option for prescriptive and institutionalized forms of 'participation'. It also comprises the constitution of representative commissions of affected people and holding public hearings. Although the commissions of the affected people⁹ are permeated with conflicts and tensions, in the field of conflict resolution technologies, there is an expectation of unity and consensual performances. This is functional to the appearance of symmetry between agents involved in the negotiation of interests. Thus, the damages refer to the production of social suffering on the basis of sociocultural and political aspects which engender experiences of frustration, insecurity and uncertainty with respect to the definition of 'affected person' and recognition of his or her rights.

For example, even one year after the rupture of the dam, up to the end of 2016, conciliation hearings for the company to recognize affected families were still taking place. Episodes of social awkwardness were not uncommon in these situations, as observed during hearings in the Mariana Courthouse which took place on September 14, 2016. Among the one hundred and fifteen people who struggled throughout the year for recognition as affected people, the case of a woman who was called by the judge of the judicial district to explain her claim is noteworthy. Clearly embarrassed, this woman saw herself obliged to tell a

⁹ The commissions of affected people of localities affected by the dam tailings in the municipality of Mariana were initially constituted by appointments by local public authorities. The organization of these commissions was marked by two other processes of inclusion, exclusion and continuation of subjects in the composition and actions of these bodies. Each affected locality, eight in all, has a specific number of members, but, despite this, normally three are selected to represent all affected people of Mariana, to sit at the table and participate more actively in judicial conciliation hearings.

personal drama publicly, before the entire community, so that the judge could understand her condition as an affected person. She had been subject to domestic violence from her husband and for this reason had temporarily left the village of Bento Rodrigues to live, together with her children, in a garage ceded by her brother in the city of Mariana. During the period in which she was in this temporary dwelling, she began building her own house back in the village. However, the dream of returning to Bento Rodrigues was interrupted by the disaster and, since she was not living in the locality at the moment of the catastrophic event, the company did not recognize her as an affected person, and therein as having the right to receive emergency assistance. It so happened that for two months her brother needed the garage and the woman had to go to a rented house and pay the expenses. At that point she was obligated to publicly reveal these facts of her personal life in a public hearing so that the judge could finally determine that the company should pay her rent, including reimbursement of the two months' rent which the victim had paid. In addition to the suffering of having to reveal her intimate personal life to neighbors, it is noteworthy that the decision, which deals only with emergency cases, did not consider the suffering of this family during the ten months in which they lived in a garage, without payment by the company. The 'recognition' as affected people allowed families to receive emergency and social welfare assistance measures which were agreed to in late 2015. Nevertheless, the definitions of 'affected person' and 'damages' are informed by 'eligibility criteria' about which there is a lack of consensus, precision or clarity. At any rate, such 'emergency' measures still do not guarantee those who are 'legitimated' as affected families a perspective of autonomous resumption of their lives. At this point, we turn our attention to the main instrument created by the companies for the identification of damages and the affected people: The Loss Register Survey, or cadastral survey.

The Loss Register Survey and the prevailing logic of environmental impact assessment: the interplay of legibility *versus* illegibility

The logic of environmental impact assessment permeates the form of addressing reparatory actions following the disaster, such as the direct contracting by Samarco of environmental consulting firms charged with surveying and estimating damages, as well as identifying and registering victims to be compensated. Given that it is a commercial relation between economic agents (Zhourri & Oliveira 2012), the objective of the inquiry by consulting firms inevitably shifts from a survey aimed at equitable compensation of material and immaterial damages towards the principle of cost reduction in benefit to the contractor.

The definition of those who are affected by the Rio Doce disaster is under the control of the Renova Foundation, which now represents Samarco. A socio-environmental consulting firm named Synergia was contracted to develop and implement the official survey, that is, the Program of Surveying and Registering Impacted People (PLCI - *Programa de Levantamento e de Cadastro dos Impactados*). The aim of this Program is to conduct, through individualized registering, the survey and evaluation of damages to physical and juristic persons, as well as to "families and communities impacted by the rupture of the dam in areas in which social, cultural, economic or environmental impacts are evidenced" (Synergia 2016: 6). These areas, however, pre-defined in the TTAC and assumed in the PLCI as the "coverage area" of the cadastral survey comprises "the localities and communities adjacent to the Rio Doce, Rio do Carmo, Rio Gualaxo do Norte and Santarem Stream, river channel and the estuarine, coastal and marine areas impacted" (Synergia 2016: 5), along the length of 35 municipalities of Minas Gerais and 5 of Espírito Santo where the wave of mud tailings passed.

By means of an electronic form known as Integrated Cadastral Register (*Cadastro Integrado*), an extensive and complex questionnaire was created as ‘sole instrument’ to survey the losses and damages to the ‘impacted’ populations along the length of the Rio Doce basin as far as the coast of Espírito Santo. Organized in 33 modules, or blocks of questions, which cover varied themes or “target populations”, the questionnaire contains in its printed digital version approximately 500 pages and has as specific objectives:

- a) Trace the *socioeconomic and cultural profile* of all families impacted by the *accident* of the dam;
- b) Proceed to the *survey of losses and damages of the families and of their expectations regarding reparation*;
- c) Identify *socioeconomic and cultural relations* established among the impacted population in the municipality;
- d) Furnish data of the impacted population for the application of the programs of socioeconomic and environmental reparation (Synergia 2016: 6-7, highlights added).¹⁰

Indeed, the document comprises the development of a quantitative data base about losses and damages identified which are intended for statistical purposes to inform general strategies related to the formulation and implementation of socioeconomic programs in the affected region. Nevertheless, an in-depth study of the Integrated Cadastral Survey reveals how the classifications and categories adopted, as well as the structure itself of the registration instrument, reinforce the company’s control over the definition and recognition of the effects of the disaster and, consequently, of who is considered ‘impacted’ by the rupture of the dam. It follows from this a subtle strategy of also defining ‘ineligible affected people’.

Among the underlying problems, it is worth highlighting those of a conceptual nature, since a large part of the methodological incongruences which characterize the Integrated Cadastral Survey results from that conception. Therefore, the questionnaire was formulated based on an urban and agro-industrial entrepreneurial perspective, distant from particular characteristics of the rural universe, composed, above all, of small producers, family farmers, peasants, artisanal fishermen and traditional and ethnic groups located the length of the Rio Doce basin. That aspect limits the instrument to the verification of data mostly relating to property and census-type information subsumed to that logic which is alien to the way of life of the majority of the population to which the questionnaire intends to address.

This patrimonial orientation results in yet another related problem, which is a lack of distinction between ‘reparation’ and ‘reconstruction’. Indeed, according to Nigg (1995), the processes of recovery are not part of policies of reparation, since reconstruction is not limited to the restitution of the physical and material aspects affected or to the reposition of infrastructure and income. In the light of this important observation, we note that the pre-defined instruments for the cadastral survey do not contemplate mechanisms for the identification of fundamental elements for the reconstruction process, namely: territorialized networks of social relations (labor, kinship, neighborhoods and support), forms of signification and use of space and of resources, cultural values, among others. Furthermore, the patrimonialist logic impedes the formulation of questions comprising categories which are particular to the universe of those interviewed regarding activities, for example, of an informal nature, such as manicures, day laborers, peddlers, boatmen, among others. In this case, as source of income and provision for families, these informal activities are part of the set of ‘life strategies’ employed by the affected subjects and families for their economic and social reproduction, as pointed out by Oliver-Smith (1993).

¹⁰ Since the initial version, the integrated Cadastral Register passed through various significant alterations. In the case analyzed, the version of July 2016 of the questionnaire, still signed by Samarco, was judiciously examined by the interdisciplinary team of GESTA/UFMG, whose objective was the identification of possible mistakes, insufficiencies or gaps related to the objectives of reparation and compensation of damages caused, such as proposed by the PLCI (GESTA/UFMG 2016).

The notion of life strategies is not limited to material aspects (Bebbington 2011). It refers to the ways of life of different affected groups and segments, their routines of subsistence, provision and labor, their territoriality and structures of social relations and ecological conditions which sustain such routines. Hence, unlike a snapshot picture of patrimonial assets affected “on the date of the event”, the life strategy concept allows the identification of flows and dynamics of social life which were compromised by the disaster. A broader concept of reconstruction thus ties the survey of damages to an examination and understanding of such life strategies.

The categories used in the cadastral instrument tend to underestimate the scope of affectations by restricting them to the river channel. On this point, it is worth observing that the differentiation among “Impacted, Residual and Remaining Area”, as well as a pre-defined coverage area of the cadastral survey restricts ‘adjacent’ localities and communities to the courses and bodies of water affected by the mud tailings. Thus, the delimitation of the affected universe as corresponding to the spatiality of the mud is questionable, since there are areas which are not reached physically by the tailings, but are ‘impacted’ in relation to conditions of permanence or feasibility of access and utilization. Affectations are also relative to the effects of isolation which compromise preexisting cultural and commercial practices and relations, as exemplified in the case of G., mentioned above, farmer whose house was not destroyed, but remains isolated within the debris of the community.

Therefore, we can state from the above that the reference for the organization and analysis of the data is centered in property/edification, rather than in the families, as component units of affected social organization. The families appear in the proposed indexation¹¹ as users of the properties. That strategy is in keeping with the evaluation of the patrimonial focus of the cadastral survey, and it curbs the examination of the collective spheres which structure routines, life strategies, memories, belongings and identities. Thus, the cadastral survey is a form of production of a database centered on impacted properties, for which there is an expected “geo-localization of lands impacted by the event in the territory of origin” and “geo-localization of property owners” (Synergia 2016: 11). Similarly to Environmental Impact Assessment Studies developed by consulting firms, the indexation of data which have as references the lands and buildings has the effect of obliterating diverse and complex situations related to the forms of use and management of territories and the composition of domestic groups (Zhouri & Oliveira 2015).

Among other critical aspects of the process of the cadastral survey, as rather usual in situations of environmental licensing, the direct contracting of environmental consultants, including for the application of the cadastral questionnaire, is a fact which opens to question the “posture of neutrality” as technical premise of the ‘studies’. According to many authors (La Rovere 1990; Lacorte et al. 1995; Bastin & Morris 2003; Daly 2003; Zhouri & Oliveira 2012, among others), environmental consulting firms contracted directly by the interested business parties operate based on the logic of the market and defense of the interests of the contractor, an aspect that leads to the self-interested and standardized construction of impacts. The latter, far from constituting objective detectable and measurable data, in the light of unbiased technical knowledge, is, in reality, a set of affectations which are standardized and submitted to the logic of the Environmental Adequacy Paradigm (Zhouri et al. 2005). This paradigm corresponds to mitigation and compensation measures which are normally recognized and in-forced in environmental licensing. In the case under study, technical neutrality could only be potentially envisaged, initially by the inexistent direct economic ties between the contracted consulting firm and Samarco. Also, it is important to emphasize that the application itself of the questionnaire is quite a complex task, not only due to its length (an estimated

¹¹ Indexation is the process by which each impacted person, family or property is identified by means of an alpha-numerical code and its boundaries are digitalized in a geo-referenced base. The PLCI specifies the following procedure for indexation: municipality/census sector/property/ownership/ edification/ number of families who use the edification (Synergia 2016: 10).

three and a half hours are needed to apply it), but also to the technical and institutional terminology which require additional explanations for it to be understood by the affected people.

It is relevant to note that the cadastral instrument is limited to the application of a model device constituted by the sequence of the following questions: “Was there affectation/impact? Was the situation reestablished? How was it reestablished?” This sequence of questions presupposes an objectivity and readiness, on the part of the affected people themselves, regarding the recognition of the loss endured. This, in addition to transferring the responsibility for identification of the affectations to the victims themselves, is revealed as an instrument incapable of identifying damages resulting from the dynamics unleashed by the disaster. As we have argued, what is involved are processes which unfold and sometimes become long-lasting, and are difficult to be organized in the conventional manner of a matrix of evaluation of environmental impacts which are classified by duration, extension and magnitude. As we have emphasized, in the case of disasters, affectations are not a part of ‘impacts’, since consequences remain as damages multiply, that is, as the disaster, as a process, is experienced by the social group (Valencio 2014). Also in this sense, the fixation of the temporal mark “*on the date of the event*” becomes pernicious. For example, the cadastral module of agricultural activities has the following question: “*on the date of the event, what crops were you cultivating?*” The limiting and fixing of this mark (5 November 2016) erases the diversity of crops of the entire annual cycle and does not consider practices such as crop rotation and may even result in limiting reparation measures, since some activities have a seasonal organization of labor. Furthermore, the word ‘event’ consists of an improper euphemism as a name for the disaster, whether considering the dimension of the tragedy experienced by the affected people, or due to the fact that the disaster has not ended with the critical situation which it caused, but rather spills over (*efeitos derrame*, Gudynas 2016) for prolonged period and at diverse levels and scales of social, environmental, political, economic, and institutional life, among other spheres.¹² Thus, the categories employed in the questions and in the options for response to the cadastral questionnaire constitute a fixed matrix, pre-defined and permeated by a logic based solely on individualized private property, even though its objective is also to evaluate family and cultural losses. In fact, the damages, losses and disadvantages resulting from the rupture of the dam can be perceived and experienced by the affected people in different ways, not necessarily associated with the pre-defined modalities listed in the questionnaire. Furthermore, the patrimonial framework limited to formal elements in the matrix does not allow for comprehending *pluriatividades* (Schneider 2003) employed by the affected subjects, which coordinate diverse activities in specific seasonal flows. For example, there is a lack of a set of questions aimed at the identification of the effects of the disaster on occupations/labor and income, unless these can be categorized as ‘trade/services’, ‘agriculture’, ‘ranching’, or ‘extractivism’, which is important in the case of the occupations of an informal character mentioned previously. Similarly, customary rights of use and possession of affected lands are neglected, and cultural and territorial aspects of ethnic groups, such as indigenous and *quilombola* communities located in the Rio Doce valley, as well as other traditional peoples, are disregarded. The result is that the cadastral survey and questionnaire and, consequently, the reparation policies, are compromised by the curtailment of rights.

To sum up, we argue that the cadastral instrument is an inadequate and insufficient method of identifying losses and damages. The *Cadastral*, as a whole, is concentrated on material and individualized aspects of the affected areas. The communities and social groups, as collective spheres of existence, constituted by values, social practices and specific world views, historically constructed in relation with territories, are not considered as units of study and analysis. However, this universe of groups and collectivities exceeds the sum of families and properties registered in the census. Indeed, the *Cadastral*

¹² It is worth mentioning that, in the dimension of the community of shared meaning by certain affected groups, an *event* is also comprehended as a festivity or artistic or commemorative show.

fails to apprehend the affectations on the forms of social organization which remain invisible, as well as the differences constituted in the collective plan, in particular, the effects of the disaster on networks of interaction, labor and reciprocity and on the formation of social and cultural identities. These limitations contribute to perspectives of disarticulation of local groups and the multiplication of difficulties concerning the reposition of conditions of their sociocultural reproduction. The exclusion of the collective sphere of existence ignores the contribution of the disaster to aggravation of existing tensions, to possible generation of social conflicts and to practices of discrimination/stigmatization imposed on the victims.

Final Considerations

In one of the meetings between the Commission of Affected People and the companies, the representative of the latter presented a proposal for a cadastral survey and underscored the need to develop a 'matrix of damages' as reference for reparation and compensation measures. Distressed with the proposal, P. reports: *"I went and asked him (the representative of the company): -- look here, you're showing this, you say that it's all calculated, all mathematics, but I don't accept that mathematics, no I don't!"*. Then he answered: *-- "but it has to be like this, we have to work with an orientation..."* I insisted: *"I don't accept you coming with that mathematics, no I don't, because even my soul is dirty with mud"*. When asked about the reaction of the company employee, P. continued: *"he wasn't moved; he said whoever is still not satisfied can sue us"*.

As we have argued, the enumerative prose constituted by the cadastral survey is based on the principle that damages are positive facts, measurable and translated by sequences of figures capable of ordering reparation policies. On the one hand, the choice of the cadastral instrument and the form in which it has been organized demonstrate the preference for a synoptic methodology. This is in keeping with the need to simplify and standardize with a view to produce legible and accessible territories and subjects by means of technical intervention (Scott 1998). On the other hand, the presentation of such 'enumerative strategies' as an imperative or condition which cannot be challenged reveals the presence of a certain fetishism of numbers in which the avalanche of figures is accompanied by the proliferation of categories. Therefore, if we frame this within forms of management crisis and its effects, we can highlight affinities between that modality of enumerative discourse and modes of production of "bureaucratic indifference" (Herzfeld 2016). As Hacking recalls: "Nothing is more anonymous than the bureaucracy of the statisticians" (1991: 193). Contrary to the distancing, anonymity and sterile nature of calculations, P. and others relocate the concreteness of the body and of losses, the intensity of feelings, the eloquence of the narratives which seek to emphasize the permanence of the damages and the depth of the pain.

Nevertheless, the conceptual frames and actions which involve negotiation of the effects of the disaster and include an active and directive participation of the company have contributed to aggravate social suffering of the victims of the Rio Doce disaster. The companies (Samarco, Vale and BHP Billiton) have been allowed to interfere in the process of defining reparation and compensation actions, a fact which helps to guarantee the interests of the companies in detriment to the rights of the affected people. The victims, in turn, even while in a situation of vulnerability, are forced into spaces of institutionalized and bureaucratic participation. The increasing weariness with the imposed negotiation process is compounded by a feeling of insecurity in relation to the constitutional right to the reconstruction of community life. As we have sought to highlight throughout this article, the institutional treatment of the disaster continues to aggravate processes of social suffering in two manners: the control over participation imposed by the emphasis on resolute social technologies and on expectations and requirements placed on victims by requiring that they prove they are 'affected people'; and the control which is exercised by means of 'enumerative strategies' (Appadurai 2005), represented by the cadastral instrument, its categories and

procedures of identification and measurement of damages. For Hacking, “the bureaucracy of statistics imposes not just by creating administrative rulings but by determining classifications within which people must think of themselves and of the actions that are open to them” (1991: 194). In this way and in recording the ordering and categorization of the subjects and ‘quantification’ of their losses, such as in the colonial censuses analyzed by Appadurai, numbers appear to fulfill not only a referential function, but also relocate “questions of entitlement (what are your rights?) and classification (what group do you belong and where does it fit in the political landscape?)” (2005: 115). The management of new territories of risk produced by the disaster and the continuously contested and recalcitrant universe of losses which multiply, place challenges of legibility and legitimacy to which the choice of the patrimonialist cadastral instrument attempts to respond. As Appadurai (2005) points out: “*that prose of cadastral domination*” (2005: 121), with its numerical tables, monetary values and maps “*normalizes and rationalizes*” (2005: 121) the diversity and density of local practices of use of territory and its resources. In the case under study, such processes of normalization and rationalization make possible the construction of an inspection device which is not fiscal (as in censuses), but rather *political*, producing and consolidating the frontiers of rights. The simplification, standardization and reduction of the experience of the losses and the suffering to a ‘matrix of damages’, whose categories are limited and pre-defined not only “*flatten and enclose*” (Appadurai 2005: 133) possibilities and paths of subjectivation, but also reveal a powerful mechanism of subjection, capable of instituting subjects with ineligible rights and illegitimate victims.

In this domain, ‘*learning to be an affected person*’ comprises the challenge of subverting the managerial direction underlying the hegemonic grid of entrepreneurial categories which contribute to the emergence of tensions and the crystallization of dissensions among the victims. To be affected is about questioning the possible coincidences between legibility and docility, reconstituting identities, feelings of belonging and strategic ways of political acting.

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