

Natural disasters as a symptom of a disputable development: considerations on the Brazilian institutional vulnerability

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Abstract

This study focuses the occurrence of natural disasters in Brazil by introducing the object of the Sociology of Disasters and a synthesis of the literature concerning social and institutional dimensions of vulnerability. An analytical prism is built from the concepts of incomplete modernity and environmental injustice, focusing on the inefficiency of the State to deal with vulnerability as a constitutive part of the naturalization of inequalities and the banalization of disasters. Based on official data from the Civil Defense archives relative to the 2003–2009 period, we analyze: (a) the importance of disasters related to hydrometeorological hazards in the context of reported occurrences, (b) the distribution of these occurrences in Brazilian states that, according to the Human Development Index (HDI or IDH – Índice de Desenvolvimento Humano), express distinct development levels, (c) the frequency of disasters by affected municipalities, and (d) the evolution of the number of affected in the 2003–2009 period. We conclude that natural disasters in Brazil are strongly related to the extremes of water stress and water excess and the low institutional response, resulting in the increase of the number of affected.

Keywords

Public administration, Civil Defense, Sociology of Disasters

Introduction

A scientific debate in the context of the Social Sciences in general and of the Sociology of Disasters in particular cannot avoid the critical analysis of the so-named natural disasters, among other reasons, for the increase of the occurrences and the number of affected in the whole planet. In Latin America the situation is dramatic (CEPAL 2008) and according to the preoccupying scenarios listed by the latest reports from the Intergovernmental Panel on Climate Change (IPCC), vulnerability tends to increase (IPCC 2007). The Sociology of Disasters exerts itself to untangle this issue, in order to explain that the qualifying term *natural*, when linked to the substantive term *disaster*, defines in essence the characteristics of the menace factor, rather than the inexorability of the tragic event. To fully describe such event, one must have in mind the processes that constitute the societal failure in

dealing with certain natural phenomena that generate severe damage and harm in a territory.

Thus, this sub-area of knowledge is mostly built by distinguishing between natural disasters and naturalization of disasters. The naturalization of disasters that permeate the common sense of less-developed or emerging countries such as Brazil has a doubly deleterious effect in reducing the vulnerability: (a) it makes the strengthening of the public opinion that do not takes into account the social-historical understanding of territorialization processes, making specific groups susceptible to the adverse contact with certain natural phenomena, and (b) it retardates the societal political organization to interact with the State, aiming at an increasing improvement of civil defense practices. Without a proper social-historical understanding and an active social-political interaction, the society crystallizes its vulnerability and the State, in turn, accommodates itself in bureaucratic slow-



ness and myopia. And natural disasters keep on taking place.

In Brazil, the Sociology of Disasters exerts itself to bring to discussion the inability of public institutions, in special the Civil Defense, to deal with natural disasters. Such disasters, under the viewpoint of the Sociology of Disasters, mostly derive from either inadequacies of public policies or practices of the state agencies to deal with the structural vulnerability translated into poverty.

Vulnerability is a concept that refers to the exposure of individuals or groups to stress, with unexpected changes and breakup of life systems. To minimize damage, the institutions have to be properly prepared, so as to coordinate public and private planning (Adger 2006). The literature that deals with social vulnerability in the face of natural menaces contains relevant critical analyses concerning the social interactions between the State and civil society, in respect to class (Bullard 2006), gender and ethnical-racial dimensions (Peacock and Girard 1997, Quarantelli 2006). Equivalent importance must be attributed to the subgroup of studies on institutional vulnerability in the face of emergencies, such as the contributions from Gilbert (1988) and Quarantelli (2005), among other researchers.

If the institutions of a country are weakened by structural poverty, distributive inequalities, corruption, bloody conflicts or wars, such country is less prepared to deal with the impact of natural menaces (Noy 2009; Kapucu 2009). The institutional vulnerability in civil defense, characterized by problems of structural nature – as insufficient human and material resources –, or of relational nature – such as adoption of authoritarian practices, lack of internal cohesion, lack of public reliance in its merits –, is particularly preoccupying, because it tends to increase the adverse effects of the impact of natural menaces on local social groups that are already fragile concerning their auto-determination (Valencio et al. 2006). The eventual ineptitude of the emergency agencies in producing and transmitting information in accessible language and communication media can represent a disservice to a social group who needs this information to protect itself from imminent danger and must absorb it properly and in time to warrant its survival and minimize material damage (Lindell and Perry 2004).

If at one extreme the social-political maladjustment of less-developed countries results from

a larger susceptibility of the local territorialization processes to certain natural phenomena, it is made believe that at the other extreme a higher level of development is the solution to reduce natural disasters. According to Beck (1992), Giddens (1998) and Irwin (2001), the prevailing present-day conception of development and the practices that materialized it in the context of modernity is supposedly associated with a larger control of the society on natural phenomena, a relationship that the authors wisely signal as controversial. Moreover, such society is not free of countless technologic risks, or risks related to the use of nuclear energy, to alimentary habits and implications to human health. In fact, such risks are widened, making indissociable a search for material progress and a living together with uncertainties related to well-being.

Brazil, as an emerging nation and historically characterized by distributive inequity, displays the worst of both worlds concerning disaster events and whose prevalent affection presents a class bias, secondarily meddling gender, age, origin and ethnical-racial dimensions. In the last years, several researches carried out by the Laboratory of Study and Social Research on Disasters of the Sociology Department of Federal University of São Carlos have demonstrated that among the impoverished prevails the multifaceted affection of the families of migrants, composed by black people and mulattos and commanded by women. Such families, which collectively produce the so-named risk areas, live in acute suffering during the rainy season and the stress on women is increased, once they have to care for the more vulnerable members of their families, such as children and elderly people. When their dwellings are severely destroyed or damaged by rainfall, the transference of these families to temporary shelters is an indication of the lack of an alternative net of social support (Siena 2009, Vargas 2009, Valencio 2009a).

In the shelters of the country, the impoverished are chronically unassisted by the State, whose indifference produces a permanent social vulnerability. In these circumstances, the impact of natural hazards, specially of hydrometeorologic nature, only situates in time the successive tragedies of a current collective abandonment. The neglect of the Public Power and the scarce family income not only reduce the range and the efficacy of the repertoire of strategies which the group can count on, but also limit the intracommunal solidarity when it comes





to prolonged droughts or intense rainfalls.

On the other hand, when the territorialization process of the impoverished occurs peripherically to economic affluence or in hyper-peripheries, according to Torres et al. (2003), there is a synergy of natural and technologic menaces. In the hyper-peripheries, the impact of hydrometeorologic hazards, such as intense rainfalls, is felt in the synergy with sanitation problems, causing contamination of rainwater by solid waste, domestic and industrial effluents, thus deteriorating human and environmental health; in the synergy with land concentration and real state speculation, leading the families to occupy land susceptible to flood and landslide; in the synergy with educational and financial problems, converting income in low-standard and technologically less-resistant dwellings; and in the synergy with intense soil perviousness and with surrounding urban drainage problems, increasing the volume and speed of water in superficial drainage, washing away immovables, movables and lives, with objective and subjective damage to the affected. Thus, there are two social-environmental temporalities that interfere with one another in rainfall-related disasters: (a) the slow and durable temporality of the social inequalities, which refers to the pattern and the rationality that rule the social-political interactions of the impoverished with the State agencies, and (b) the fast and tragic temporality, which refers to the disruptive events involving rainfall with disorder, disorientation and destruction of the routine of families and communities. Such disruption is not dissociated from the well-known and long-lived social drama. They also cry about the preceding temporality, in which loose promises of social inclusion.

Either at the farthest corner of the rural world or in the hyper-peripheries of Brazil, disasters are viewed as an unequivocal expression of a contestable development. They imply a laceration of the impoverished daily life, because they break the routine already made difficult by current material restrictions to warrant vital and social minima. From the prevailing social-economical characteristics of the affected, it can be said that the disasters result from what Martins (2003) calls incomplete modernity and from what Acsehrad (2000) considers environmental injustice. A contention of the development model materialized in Brazil can be divided into several analytical axes, one of which, within the scope of Sociology, showing how much

the public administration is (or is not) concerned with principles of accountability, having as main effect the decrease (or increase) of the number of municipalities that decree *emergency situation* (s.e.) or *state of public calamity* (e.c.p.), when disasters take place. When the numbers of disasters increase – either by the events affecting the same area, or wider areas, or causing an increase in the number of affected – there is a strong indication that the institutional vulnerability concerning civil defense is the structural element that not only precedes, but also favors the tragic event. There is a slow and durable temporality of neglect and omission on behalf of the public institution, which must be seen behind the figures that point to a critical situation.

In constitutional and multilateral terms, the institutional role of the civil defense is to protect human life (Brazil 1988) and extend the dignity of this life (ISDR 2003). Civil defense reaches its institutional maturity when the State envisages its attributions as essentially intersectoral and transversal coordinated, optimizing the use of material and human resources to promote a safer space. On the other hand, if these attributions are segmented, several sectors of the State naturalize the disasters and favor their spreading. Without a legitimate cohesion of public policies, the *ethos* of the civil defense tends to a mere collectivism, progressively relieving it of the fulfillment of its mission towards the citizens.

Material and Methods

As a basis for the sociological analysis of the Brazilian institutional vulnerability to deal with multiple stressors, in special with the ones related to hydrometeorologic hazards, we will start with the evolution of disaster (s.e. or e.c.p.) reports made by municipalities and acknowledged by the major authority in disasters in Brazil, the National Secretariat for Civil Defense (SEDEC), during the 2003-2009 period. The administrative procedure of officially recognizing a disaster takes place by means of an edict published by the Ministry of National Integration (MI), which is linked to SEDEC.

The disasters occurred in the 2003-2009 period are characterized and analyzed according to:

- a) the importance of the disasters resulting from hydrometeorologic hazards in relation to the occurrences in the period;
- b) the distribution of occurrences by federal state,



- which, according to the Human Development Index (IDH), expresses distinct levels of development;
- c) the frequency of the occurrences by affected municipality, characterizing the distinct recurrent groups;
 - d) the evolution of the number of affected in the period.

Results and Discussion

From 2003 to 2009, according to official data from the National Secretariat for Civil Defense¹, 10,195 edicts recognizing disaster were issued by the Ministry of National Integration, typified as *emergency situation* (s.e.) or *state of public calamity* (e.c.p.). Except for five edicts related to disasters under the direct jurisdiction of the state government (such as destruction of highway infrastructure), the others (n=10,190) are occurrences started under the immediate municipal jurisdiction and are the main focus of this study.

Emergency situation (s.e.) and *state of public calamity* (e.c.p.) are degrees of severity formally attributed by the municipal manager to the disaster that occurs in the territory under his jurisdiction and whose specification is made according to two variables: the financial conditions of the municipality, and its technical capacity to respond and recover from the damage and loss. The decree of a disaster signals at least two different but associated aspects of fragility concerning the public manager: (a) the financial incapacity of the public institution to rebuilt the destroyed or severely damaged spatial fixes and flows; (b) the existence of faults and omissions of the State fractions (in relation to improvement of the practices of their technical organs, to financial support to communal and private-sector contingency plans, to the celerity to render effective popular habitation policies, to the educational actions for risk reduction, among others) to promote prevention and proper preparation of the society.

A disaster that has taken place and has been officially acknowledged as such constitutes by all means a declaration of circumstantial administration incapacity, which should induce the careful public manager who decrees it to wish that the social, official and public memory be relieved from this record. However, the public practices of decreeing and acknowledging disasters proliferate in Brazil and are repeated with no embarrass-

ment. The 15 year-old National Civil Defense System (SINDEC) has produced a multi-scalar (municipal-state-federal) bureaucratic routine to de-dramatize the events and dilute them among paper flows and power relationships that involve the use of public resources. The occurrence and recurrence of requests from the municipal institution to the authorities has been made commonplace to attract an extraordinary inflow of financial resources and technical support to manage the devastated scenario.

This banalization of disasters, of a questionable social-political learning, is evidenced by the type of hazards that is more constantly associated with s.e. or e.c.p.: the hydrometeorologic hazards, which represents 98.97% of the disasters recognized as such by Brazilian authorities in the 2003-2009 period. At one end lie the dry seasons and prolonged droughts events (67.32% of the total) and at the other end, intense rainfall, tempests and alike (31.65% of the total) (Table 1). Thus, when analyzing the occurrences of disasters in the country in multi-scalar terms, the so-called natural

Table 1 – Edicts recognizing disaster (s.e. and e.c.p.) in Brazil, 2003-2009 period, in absolute numbers and percentages (n=10,195*)

	Occurrences related to dry seasons and prolonged droughts	Occurrences related to intense rainfall, tempests and alike	Others
Number of edicts	6,863	3,227	105
Percentage in relation to the total	67.32%	31.65%	1.03%

(*) including five edicts relative to disasters under no municipal jurisdiction

disasters and high social vulnerability to the water scarcity-excess polarities are essentially identified. In the nation's social-historical and social-environmental trajectory, however, these polarities are not unprecedented – to the point that the Emperor D. Pedro II pitied himself from the Great Drought that inflicted the people from Northeastern Brazil by the end of the nineteenth century. In the Republican institutional fabric, organs of specific competence in the matter of hydric resources and National Civil Defense have emerged in the 1930's and 1940's – the experts inside the State apparatus were unable to properly mitigate the adverse effects of such hazards through the decades, reaching the dawn of the twenty-first century with old challenges to be overcome.

Brazil has 26 federal states and a federal district distributed into five macro-regions, some accomplishing high development standards, such as the Southern and Southeastern regions. The other regions are less-developed, such as the Northeastern Region. Take into the Human Development Index (IDH) as a reference to rank the federal states, one of the Southern Region – Santa Catarina – and one of the Southeastern Region – São Paulo – stand out for their high IDH, respectively in the first and second positions. In the opposite pole, the states from the Northeastern Region – Alagoas in the last position and the penultimate Maranhão, share the worst development levels among the Brazilian states. Nevertheless, has an apparently unusual correspondence between development and disaster. In the current social imaginary, it is expected that the most developed states be the most resilient; however, these states are the most prone to natural disasters to the point to configure vulnerability approximately three times greater than that of the less-developed states, when the numbers of edicts are compared (Table 2).

Table 2 – Federal states with the two highest and the two lowest Human Development Indices (IDH) and the relationship with the number of edicts recognizing disaster, 2003-2009 period

States with highest IDH	Ranking	IDH(*)	Total of edicts
Santa Catarina	1 st place	0.840	1,019
São Paulo	2 nd place	0.833	221
States with lowest IDH		IDH	Total of edicts
Alagoas	27 th place	0.677	368
Maranhão	26 th place	0.683	68

(*) Data from PNUD / João Pinheiro Foundation relative to 2005

Although this proportion does not hold when comparing the other positions polarized in the ranking, it is possible to attest that development does not mean the suppression of social vulnerability in the face of natural hazards. The third highest IDH of 0.832 corresponds to more-developed states of Rio Grande do Sul, in the Southern Region with 1,515 edicts recognizing disasters in the period, and Rio de Janeiro, in the Southeastern Region with 153 edicts. The opposing IDH corresponds to the antepenultimate place occupied by Piauí in Northeastern Region (IDH = 0.703), with 615 edicts recognizing disasters. In the fourth best position is Paraná (IDH = 0.820), located in the Southern Region and with 193 edicts, whereas in

the fourth worst position (IDH = 0.718) are two states of the Northeastern Region: Paraíba, with 1,220 edicts, and Pernambuco, with 612 edicts. In this second group of comparisons, it is observed that the impoverished and affluent regions are equally exposed to risks, which configure large abnormalities in the local social routine.

An illustration of the low public capacity to attendance services in disaster context occurred in three Brazilians cities early 2010: Rio de Janeiro city, Angra dos Reis and São Luis do Paraitinga. Despite their sizes, all were severely affected.

Rio de Janeiro is the capital city of Rio de Janeiro state. Its population is 6.186.710 inhabitants (IBGE 2009), the HDI is 0.842 (PNUD 2000) and the GDP *per capita* is R\$ 19,524.00 (IBGE 2005). In February 2010, intense rainfall triggered an emergency situation, with many floods and landfalls that caused major damages, affecting different areas and approximately six millions of people.

Angra dos Reis is located in the south coast of Rio de Janeiro state. The local population is 168,664 inhabitants (IBGE 2009), the HDI is 0.772 (PNUD 2000) and the GDP *per capita* is R\$17,426.00 (IBGE 2005). In January 2010 Angra dos Reis municipality declared state of public calamity due to severe landfalls triggered by heavy rainfall. The episode affected 4,758 people, of which 120 were unsheltered and 5 died. In addition, 100 residences were damaged and 18 were destroyed (Brasil 2010). Other episodes of landfalls and flooding occurred until March and affected 29 people, from which 9 were unsheltered. Further, it damaged 40 residences, 39 partially whereas 1 was completely destroyed (Brasil 2010). As a whole, there were 9,400 affected people and 50 deaths (Freire 2010).

São Luis do Paraitinga is a small city located in the countryside of São Paulo state. The local population is 10,908 inhabitants (IBGE 2009), its HDI is 0.754 (PNUD 2000) and its GDP *per capita* is R\$ 6,238.00 (IBGE 2005). On the 1st. January 2010 the city was severely hit by intense precipitation and the state of public calamity was declared. Floods destroyed the historical center of the town, affected 9,000 people (82.5% of population) and one person died (Defesa Civil Voluntária 2010).

In order to identify patterns of institutional vulnerability in civil defense, expressed by the occurrence and recurrence of the municipal executive power to decree s.e. or e.c.p., which are dully recognized edicts by superior authorities (n=10.190),

a vulnerability ranking of the municipalities was produced. It should be firstly considered that 3,141 municipalities underwent disasters recognized by the federal government in the period, which represents 56.44% of the total of the Brazilian municipalities (n=5,565). This signals the extent of the problem nationally and reaching epidemic proportions. Moreover, as the menace factor becomes familiar, that is, known historically and institutionally, and furthermore predictable, the official strategies to face social-spatial vulnerability should be consequently adequate but they aren't.

Of the total of 3,141 municipalities affected in the period, the municipalities that presented up to two edicts decreed and recognized in the 2003-2009 period (1,617 municipalities) were considered of *low institutional vulnerability* in civil defense; those that presented three to four edicts in the period (790 municipalities) of *medium institutional vulnerability*, and those that presented a high recurrence, with five or more edicts acknowledging disasters in the period of *high institutional vulnerability*. The last group encompasses 734 municipalities with 5,293 edicts, that is, 51.94% of the edicts requested by municipalities in the 2003-2009 period (Table 3). Such numbers indicate, on one hand, the existence of what Valencio (2009b) calls *disaster clients*, that

is, public agents associated with enterprises that fill their pockets by using the public apparatus, excusing themselves, when a disaster is decreed, from the rigidity concerning bidding processes for the purchase of goods and services. On the other hand, they complement the worries that the Brazilian Court of Audit (TCU) recently manifested in relation to the possible distortions of the SEDEC institutional interactions with some federal states, reflected, among others, in distortions when conceding resources (TCU, 2010).

Finally, the progression of the number of affected is preoccupying because it has reached almost 12 million inhabitants affected in the last three years (Table 4), evolving upwards in 33.14%, in the 2007-2008 comparison, and in 51.58% in the 2008-2009 comparison.

Table 4 – Evolution of the number of affected in disasters occurrences, 2007-2009 period (*)

Year	Number of affected	(*) Data from the document Occurrence of Disasters made available on the SEDEC site on 16th February 2010
2007 (*)	2,745,677	
2008 (*)	3,655,680	(**) Data from the document Occurrence of Disasters made available on the SEDEC site on 24th February 2010
2009 (**)	5,541,447	
TOTAL	11,942,804	

Table 3 – Number of edicts recognizing disaster by municipality, 2003-2009 period
(number of edicts = 10,190)

	number of municipalities	Total of decreed edicts	% of edicts
Municipalities with one edict	1,016	1,016	
Municipalities with two edicts	601	1,202	
Subtotal of municipalities with low institutional vulnerability	1,617	2,218	21.76
Municipalities with three edicts	481	1,443	
Municipalities with four edicts	309	1,236	
Subtotal of municipalities with intermediate institutional vulnerability	790	2,679	26.29
Municipalities with five edicts	212	1,060	
Municipalities with six edicts	139	834	
Municipalities with seven or more edicts	383	3,399	
Subtotal of municipalities with high institutional vulnerability	734	5,293	51.94



Conclusions

When analyzing the unequal processes of territorialization combined to the instrumental rationality of the groups that control the State fractions, the anomalous development is a rouser of disasters.

The modernized and modernizing object and action systems, which are in constant mutation and discard, promote dynamism and autonomy of the space that benefited from them but apartness in relation to the precariousness of the neighboring citizenship. In this aspect, the incomplete modernity is represented not only by the increase of the contingents that daily suffer from losses and harm due to the alternative and precarious production, but also by the action of a State that, although historically strong, is not essentially oriented to solve commitments with the social-spatial inequities.

The bureaucratization of routines that involve public administration captures the processes related to disasters and anaesthetize the public managers, not only by making them insensitive in the face of the human drama resulting from the destruction history of the affected but also by relieving them of the task of examining the situation and clearing the public apparatus, in order to avoid new episodes. A disaster is supposed to be an episode like any other: State agents find bureaucratic mechanisms to act in favor of the interests that not always comply with the reduction of vulnerability. So much so that social vulnerability considerably increases year after year. Indistinctly, both macro-social processes of territorialization associated with considerable material progress and the less prosper are prone to disasters. It is necessary to delimit the space of the impoverished within the periphery of the calamity scenario that impacts the affluent space, because it is there that the devastation is multifaceted in all dimensions of the brutalization of the dislodged and unsheltered.

The recurrence of menacing events that impact a municipality should configure, in the ethics of accountability, a growing commitment of the public institution with the local society, aiming at the improvement of strategies of prevention and preparation against the impacts of dangerous events, such as those related to hydric stress and intense or severe rainfall. In the current social imaginary, the unpreparedness of the State in general and of the Civil Defense in particular transform the successive tragedies into a tedious chant that verses

on scarce and troubled waters or, better yet, into a sad lullaby that, instead of awakening, put public awareness to sleep.

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