

# Attitudinal differences towards severe rainstorms in Brazil as expressed in a Social Media Service, suggest the way to apportion prevention and mitigation funding more effectively.<sup>1</sup>

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## INTRODUCTION

Income, geography and institutions are believed to mostly account for the casualties arising from natural disasters (Kahn, 2003). This paper argues that culture shapes people's attitudes to natural disasters as well as the efficacy of the institutions they entrust to prevent and mitigate the effect of disasters.

Brazil is a country with a strong national identity is large enough to display a variety of sub-cultures partly as a consequence of the diversity of the immigration currents that contributed to its current 190 million population stock. This work assesses two similar rainfall cases in 2011 and measures the casualties in two geographically separated population areas, with similar terrain morphology in the continent; assesses their different cultural background through meta-analysis of the literature and by interpreting the victims' spontaneous statements on a facility provided in Facebook by Climatempo, Brazil's largest commercial weather forecasting corporation. The analysis suggests that funding for storm readiness should be apportioned by the people's cultural disposition to take charge rather than only by degree exposure to natural risk, because different peoples respond differently to the same events.

Willingness to face natural events and their consequences stem from people's culture. Culture is slow to change but once its role is identified the adequate amount of resources to counteract negative attitudes can be ascertained.

Cultures which favor a perception that the control of people's destiny is in their hands pay more attention to weather forecasts, build better refuges and resort to them in timely fashion (Sims & Baumann, 1972). Other cultures, the fatalist prominent among them, favor perceptions in which people's lives are at the mercy of events beyond their control and they do not feel as guilty about the consequences of not taking prevention measures.

Brazilian landslides and flooding during rainy seasons are common. During January 2011 two severe rainstorm episodes took place in developed urban tropical areas, causing landslides and floods during the night. The differences in the reactions of these two populated areas are analyzed here from the perspective of their spontaneous messages on Facebook.

Nova Friburgo, Rio de Janeiro state, is Cfb climate in the Köppen classification, and is about 1000 kilometers NE of (continental) Florianopolis, Santa Catarina state, Cfa climate. Both are built on the steep sloped mountain range called Serra do Mar, along the Atlantic Ocean.

Social networks provided an important resonance box to the victims' plight. A partnership between climatempo.com.br, the largest weather information provider in Brazil

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and Facebook.com created a space to post messages which provided the data for a cultural assessment of the differences in attitudes to severe storms and their consequences.

### DATA AND METHODOLOGY

With the proclamation of the Brazilian Republic (1889), rent-seeking Portuguese monarchists remained the majority in control of the affairs of Rio de Janeiro. On the contrary, in Santa Catarina, in the southern tip of Brazil, control passed on to the bourgeoisie in detriment of monarchists linked to cattle ranching (Zucotto et alli, 2010, 104). The transfer of power signals the predominance of capitalist activities in the South of the Brazil. This was facilitated by the imperial government initiative from 1824 until 1889, to stimulate migrations from northern Europe and Germany particularly (Kluck, 1975, 1). These German immigrants, along with Italians ones, provided the stock of the population in the region. The concentration of European population enhanced an outward looking mentality, which triggered entrepreneurialism and a “can do” attitude which is characteristic of people who have an internal locus of control (Lenartowics & Roth, 2001, 319 ). It follows that people’s with a stronger sense of self-direction will not only show more initiative as well as more control over management outcomes, but will also pressure its civic representatives to ensure effective prevention and mitigation of disasters.

On the other hand, several authors report fatalist attitudes among Brazilian Northeastern poor, precisely the majority of the ones which migrated to the favelas (shantytowns) in Rio de Janeiro largely built on steep mountain slopes (Havighurst & Moreira, 1969,109 or Gomes, 2006). American State Department officials are reported to have believed that most Brazilian peasants “did not think they could help themselves” (Kirkendall, 2010, 31). Analysts of Latin American literature do not fail to see significant traits of fatalism in the work of Brazil’s foremost sociologist of the Northeast, Gilberto Freyre (Balderston & González, 2004 ,478).

### ANALISYS OF SPONTANEOUS MESSAGES POSTED

For sake of expediency the people of Florianópolis will be referred to as self-reliant and those of Nova Friburgo as fatalists. Table I shows that more self-reliant victims show a more

<b>Table I: messages posted during the events</b>	<b>Nova Friburgo fatalists</b>	<b>Florianópolis self-reliant</b>
<b>Number of messages</b>	84	329
<b>January 2011</b>	08/ to 14/01	19/01 to 25/01
<b>Average number of characters per message</b>	103,5	47,3

active familiarity with the weather site; posting almost 4 times as many messages as the fatalist ones.

Similarly for the objectivity of the messages, which among the self-reliant are 45% shorter.

The content of the 413 messages was classified into seven categories as in Table II which shows that, proportionately, fatalists express six times greater awe regarding the magnitude of the disaster and issue almost three times as more calls with religious overtones than the self-reliant do. On the other hand, the proportion of messages by self-reliant verifying weather conditions is three times as more frequent as those of the fatalists.

The data in table II also suggests that the fatalists seem themselves as victims of events beyond their control, while the self-reliant use the weather service more objectively and with a

greater focus on weather conditions and forecasting; on the other hand, the fatalists ask for help and issue religious exclamations.

<b>TABLE II: Message subject</b>	<b>Nova Friburgo fatalists</b>		<b>Florianópolis self-reliant</b>		Better use of weather forecasting information and greater disposition to act on the basis of that information should lead to lower death
<b>Religious</b>	15	<b>17,9%</b>	21	6,4%	
<b>Human / government fault</b>	02	2,4%	03	0,9%	
<b>About weather conditions</b>	25	29,8%	243	<b>73,9%</b>	
<b>Evaluation of disaster</b>	32	<b>38,1%</b>	17	5,2%	
<b>Call for rescue/support</b>	04	4,8%	01	0,3%	
<b>Weather forecast verification</b>	09	10,7%	109	<b>33,1%</b>	
<b>Other</b>	28	33,3%	83	25,2%	

rates. This is precisely what Table III shows: a) the dislodged population, in the storm area per hundred thousand, among the fatalists is 2.4 times than the same proportion among the self-reliant; and b) the same proportion of deaths among the fatalists is 342 times larger than among the self-reliant population.

<b>Table III, Deaths and dislodged<sup>2</sup></b>	<b>24 hours rain (mm)<sup>1</sup></b>	<b>Population.<sup>2</sup></b>	<b>Deaths<sup>3</sup></b>	<b>Per hundred thousand</b>	<b>Dislodged<sup>3</sup></b>	<b>Per hundred thousand</b>
<b>RJ</b> Nova Friburgo, fatalists	182.8	182,016	426	234	5,251	2,885
Storm area		656,633	900	137	19,717	3,521
<b>SC</b> Florianópolis, self-reliant	144.4	421,203	03	0.7	200	48
Storm area		1,392,471	06	0.4	20,576	1,478

## CONCLUSIONS

Further research should be carried out to measure the difference in fatalism between both populations, if it confirmed the analysis of the literature suggested here, the results of this work suggest an innovation in the criteria for apportionment of Federal funding for prevention and mitigation of the consequences of severe storms which hit the coastal region of Brazil every year.

Local elected authorities reflect the culture of the place. If the inhabitants are fatalists the authorities might be more enlightened or informed but will also show a greater degree of fatalism and fail to go as far in prevention and mitigation readiness as the self-reliant do. This means that fatalist authorities are likely to fail to make as much, or as soon, of the information and resources readily at hand.

Federal authorities frequently are called in to step-up in response to local crises whose magnitude could have been averted. This should give Federal authorities the power to

<sup>2</sup> Instituto Nacional de Meteorologia automatic weather stations. <sup>2</sup> - Instituto Brasileiro de Geografia e Estatística, 2010 census. <sup>3</sup> Casualties and dislodged population figures were provided by the state Civil Defense authorities.

wrestle-in their perspective into local fatalist institutions in order set-up more effective prevention and mitigation readiness in regions where fatalist attitudes are more predominant.

This also means that the Federal government should allocate and deploy its own readiness to storm-related crisis more readily where the cultural proclivity of its population leads them to doing less about it. Clearly, education must also be emphasized, but because culture is so slow to change its unlikely that the death rates will be reduced without government intervention to supplement the pro-active stance that fatalist attitudes does not favor.

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i [http://en.wikipedia.org/wiki/K%C3%B6ppen\\_climate\\_classification](http://en.wikipedia.org/wiki/K%C3%B6ppen_climate_classification) and <http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.html>