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Original Research Article

Religiousness/spirituality do not necessarily matter: Effect on risk perception and adaptive strategies in the semi-arid region of NE Brazil



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ABSTRACT

The impact of environmental changes is a major threat to livelihoods, especially for small farmers in semi-arid regions. Therefore, local communities undertake efforts to cope with these new environmental conditions and researchers try to understand the limits of possible adaptive strategies. Religiousness/spirituality are two important factors that can influence environmental awareness and adaptive responses to risks caused by natural phenomena. However, studies addressing the relationship between such factors are either scarce or based on anecdotal information. This article discusses the influence of religiousness/spirituality on the perception of environmental risks by farmers in a rural community in Brazil's northeast region, and their knowledge of adaptive strategies to deal with such concerns. Religiousness/spirituality can positively or negatively influence the perception of risk and knowledge of adaptive strategies when facing environmental uncertainty. We note that dimensions of religiousness/spirituality such as religious history, values/beliefs, commitment, and daily spiritual experiences influence wealth and the sharing of natural perceived risks, as well as adaptive strategies. Based on our results, we conclude that religiousness/spirituality dimensions exert both positive and negative effects on the perception of environmental risks and ways of coping with the impacts of rapid environmental changes.

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1. Introduction

The intensity of the impacts of rapid environmental changes on biotic and abiotic areas is already a global reality. Rural populations usually depend more on natural resources; therefore, they are identified in the scientific literature as the most vulnerable and sensitive to the effects of environmental changes (Campos et al., 2014; Nyantakyi-Frimpong and Bezner-Kerr, 2015). However, depending on the severity of the impact and periodicity of the risk to which these populations are exposed, people are able to develop strategies to deal with situations of uncertainty (Aswani and Lauer, 2014).

This raises questions regarding the processes underlying environmental risk perception. There is evidence in the literature that economic and demographic factors such as income, education, housing, age, and gender (Campos et al., 2014; Addisu et al., 2016) are important variables, as they influence people's perception of environmental changes (Granderson, 2014; Bento-Silva et al., 2015). In addition to these factors, social ties (family, political, etc.) and religious beliefs (Kuruppu and Liverman, 2011; Granderson, 2014) play a significant role in human decisions when facing environmental situations perceived as unfavorable.

Most studies on environmental awareness seek to quantify environmental risks based on socio-economic variables. Although these data are important, there is evidence that these variables are not good predictors. Thus, it is suggested that cultural dimension variables such as religion be included in the analysis to generate robust results. The latter should allow better understanding and inference of local communities' environmental perceptions and risks (Granderson, 2014).

The major religion is a variable influencing environmental perception and adaptive attitudes, as human worldview is often based on subjective experiences lived in religious congregations (Haluza-Delay, 2014), which can lead people to react positively or negatively to perceived problems (Mishra et al., 2010). In this universe of beliefs, religiousness and spirituality are different variables that can interfere in perceiving the world. According to Zinnbauer et al. (1997), spirituality refers to the individual's personal relationship with a higher being (God/gods). In addition to this direct personal belief in a supernatural being, religiousness includes an institutional organization based on a collective commitment to religious dogmas.

Despite the relevance of this subject to the risk mitigation process related to natural phenomena, literature related to religious influence on the decision-making process regarding environmental changes is based on descriptive studies. To increase understanding, we assume that religiousness and spirituality also influence the perception of environmental risks and adopted adaptive strategies, since studies in health care (Idler et al., 2003; Curcio et al., 2013) and social sciences (Boyer, 2001; Botero et al., 2014) strongly suggest this association. It is noteworthy that in the environmental change situation, the concept of "adaptation" differs from that adopted in evolutionary biology, as it is considered an individual or collective preventive/reactive behavior to cope with or adjust to a new environmental reality (Smit and Wandel, 2006).

In the field of health, it is common to use a Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS) form to characterize this cultural dimension variable for the population (Idler et al., 2003; Curcio et al., 2013; Vespa et al., 2016). The form was used in this study to measure religious/spiritual dimensions and examine whether these also affect the environmental awareness of farmers facing the effects of rapid environmental changes. In addition, we seek to understand farmers' attitudes when changes become harmful to their community. In this context, a rural community with empirical evidence of changes in the local ecological landscape caused by factors including strong exposure to extreme drought events in the last ten years (Sieber et al., 2011; Martins et al., 2015) was used as a research model in this study.

2. Material and methods

2.1. Scenario and participants

The study was conducted between March 2015 and June 2016 in the community of Carão (08°35'13.5"S, 36°05'34.6"W) in the rural region of Alinho, northeast of Brazil. This region is identified as an area at risk of extreme drought events in the National Water Agency (Martins et al., 2015) drought-monitoring map of Brazil's northeast region. The degree of risk ranges from moderate to severe, resulting in small to large agricultural losses and scarcity of water resources. Carão has experienced unusual water restrictions since 2012, and this is considered the most serious drought period in Brazil's northeast region in the last 50 years (Martins et al., 2015). This situation increased the community's exposure to the harmful effects of environmental phenomena, as local families depend on the catchment of rainwater to survive. Moreover, while agricultural activities have significantly decreased compared to that recorded in previous studies (Sieber et al., 2011), subsistence agriculture remains families' main source of livelihood, especially the monoculture of maize and beans and extensive small livestock production of cattle, pigs, and poultry.

A comparison between the local health department survey and demographic survey of Sieber et al. (2011) shows that the population of Carão has decreased over the past nine years, currently totaling 137 inhabitants (27 of whom are aged under 18 years) distributed over 55 families. It is noteworthy that some of Carão's inhabitants are at an advanced age and in poor health, and not all the other residents were available at the time of the survey. Thus, the sample comprised 50 residents who agreed to participate in the study (20 male and 30 female), most aged between 40 and 60 years. Religion is a hallmark in the Carão community, with 98% of the respondents stating that they are Christian (82% Catholic and 16% Protestant), and 2% declaring that they do not belong to any religion.

Although several studies have been conducted in the community (Ferreira-Júnior et al., 2011; Sieber et al., 2011; Santos et al., 2014), none investigated risk perception and adaptive behaviors when facing disturbances associated with the

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