



Storm and Hurricane Vulnerability: Implications of Sociological Factors for Mitigation in the Rural Communities of Trinidad

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**UWI Department of Economics Annual Conference on the
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Research Objectives

To examine:

- i. any influence of individual and systemic sociological factors on perceptions and behavior in rural areas in Trinidad towards storm and hurricane vulnerability
- ii. the implications of such influence for risk mitigation



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Presentation Outline

- Review of the literature
- Methodology and data
- Research results
- Mitigation implications

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Literature Review

- Vulnerability is a human condition (UNDP 2004, Cannon 1994) that has both personal and systemic origins (Donner and Rodríguez 2008)
- The concept of a 'sociological perspective' (Donner and Rodríguez 2008) on disasters that includes consideration of socioeconomic status, cultural attributes (Anderson 1968), (Buckle et.al 2001) and past life experiences (Phillips 1993)
- Personal attributes affect beliefs, attitudes to risk and the inclination and capacity to mitigate

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Literature Review

Systemic sociological influences on vulnerability :

- Human decisions and behaviour within communities and institutions which result in the system characteristics that create the potential for harm (Pielke et al. 2005)
- Characteristics include: infrastructure, economy, environment, public policy, community response to disaster emergencies (Birkman 2006, Pielke et al. 2005, Choi and Fisher 2003, Auffret 2003, Laing 2004))

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Methodology and Data

Examine the influence of 5 sociological attributes (lifestyle, education, gender, age and disaster experience) on 5 measures of perceptions and behaviour relative to storm/hurricane risk (hurricane loss expectations, disaster awareness, perception of national preparedness, responsibility for mitigation, risk management)

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Methodology and Data

- Regression analyses with the socio-economic attributes as independent variables and the perception/ behaviour indicators as dependent variables
- Categorical principal components (CATPCA) was applied to the 6 variables that measured perception of national disaster readiness; supplementary variables – community, gender and education
- Systemic sociological factors- review of behaviour and practices in rural areas relative to land use, development, infrastructure, economic activity, and mitigation efforts.

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Methodology and Data

- Survey of 472 respondents in 15 rural communities across Trinidad
- Structured interviews with 4 Regional Corporations dominated by rural communities
- Review of the Draft Spatial Development Plans (DSDPs) for Regional Corporations with predominantly rural communities

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Research Results- Summary

- The results support the argument that vulnerability is largely a consequence of human behavior and decisions.
- Personal attributes and systemic factors were found to be contributors to the vulnerability of rural areas in Trinidad to the effects of storms and hurricanes.
- Standard of living, education, age, gender and past experience were all found to influence perceptions and attitudes to different aspects of vulnerability and mitigation.
- Inadequate development planning, land use and economic decline in rural areas were identified as systemic factors contributing to existing storm /hurricane vulnerability.

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Research Results –Individual Perceptions / Behaviour

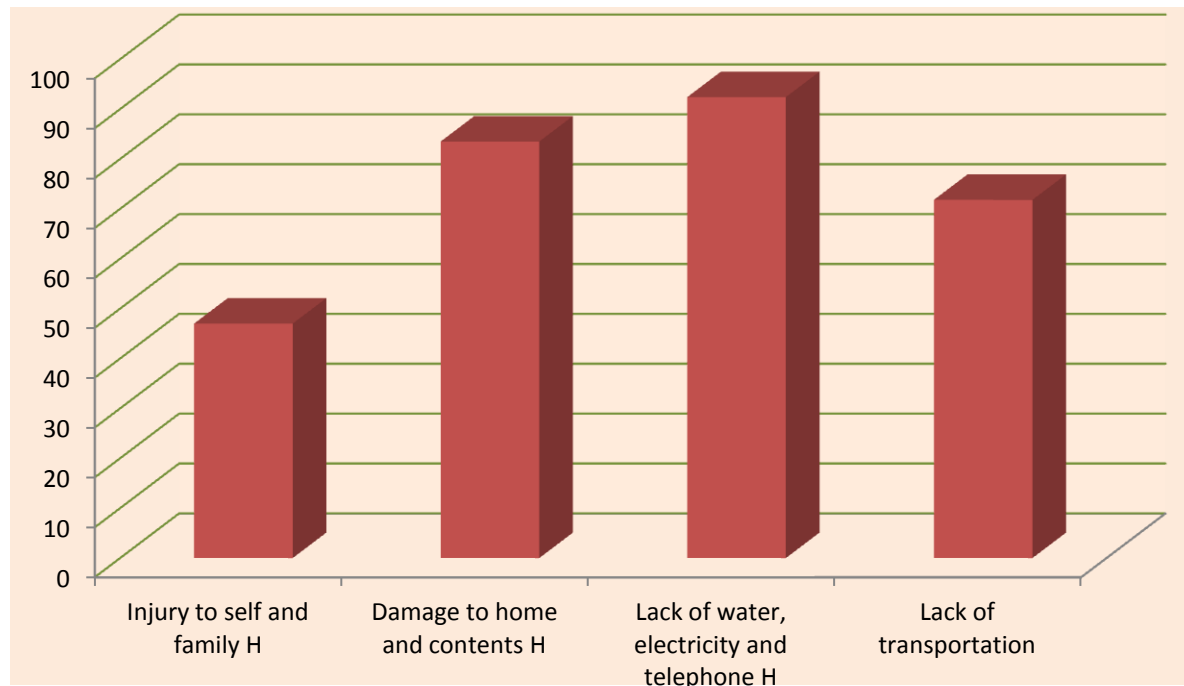
Most persons expect a storm or hurricane to hit Trinidad anytime between now and 10 years (over 45% expect it within 5 years) and believe that their home will be affected (76%) and cannot withstand such an event (73%) but:

- They are not inclined to spend money to improve their homes (66%)
- Their homes are not insured (94%) and they are not willing to buy insurance (71%), although they accept responsibility for mitigation (60%) and funding (56%) their disaster losses
- They follow warnings (93%), but only 43% know their shelters

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Positive Responses (% of Respondents)

If a hurricane strikes the area where your home is located do you expect to experience?

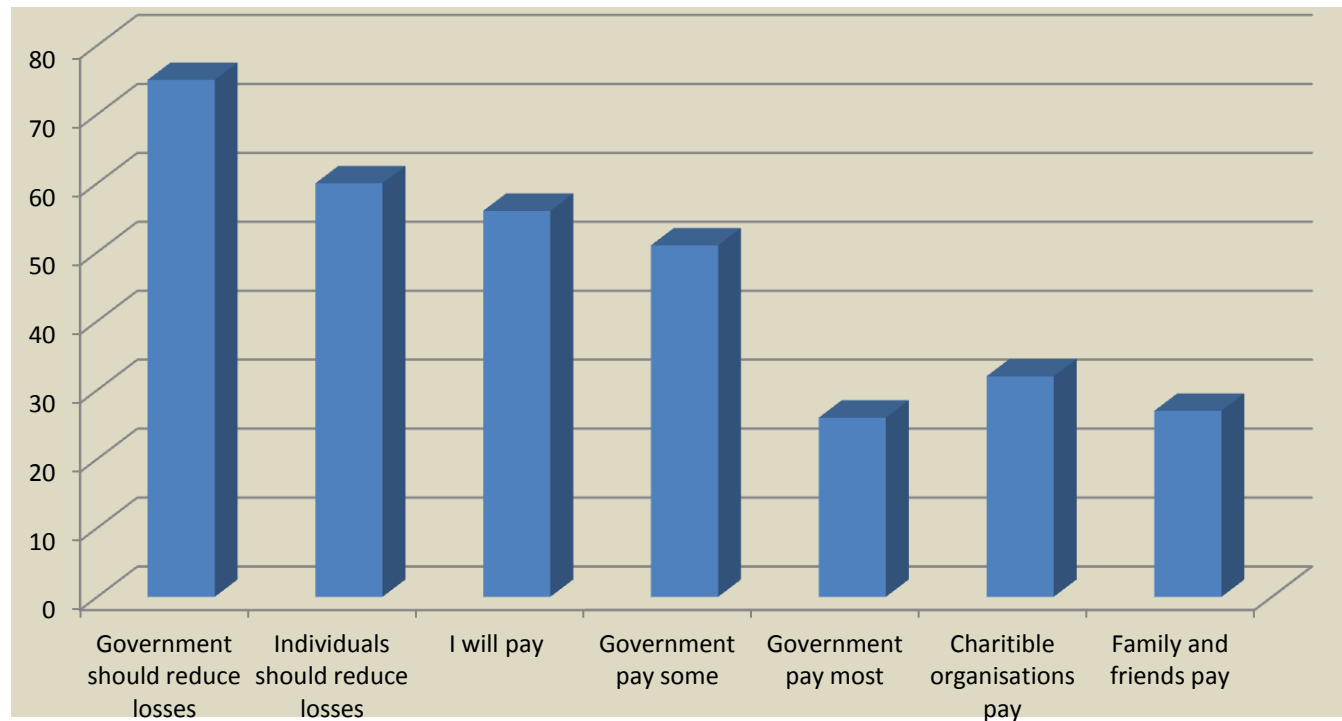


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Who should reduce damage and pay for losses from hurricanes (%)

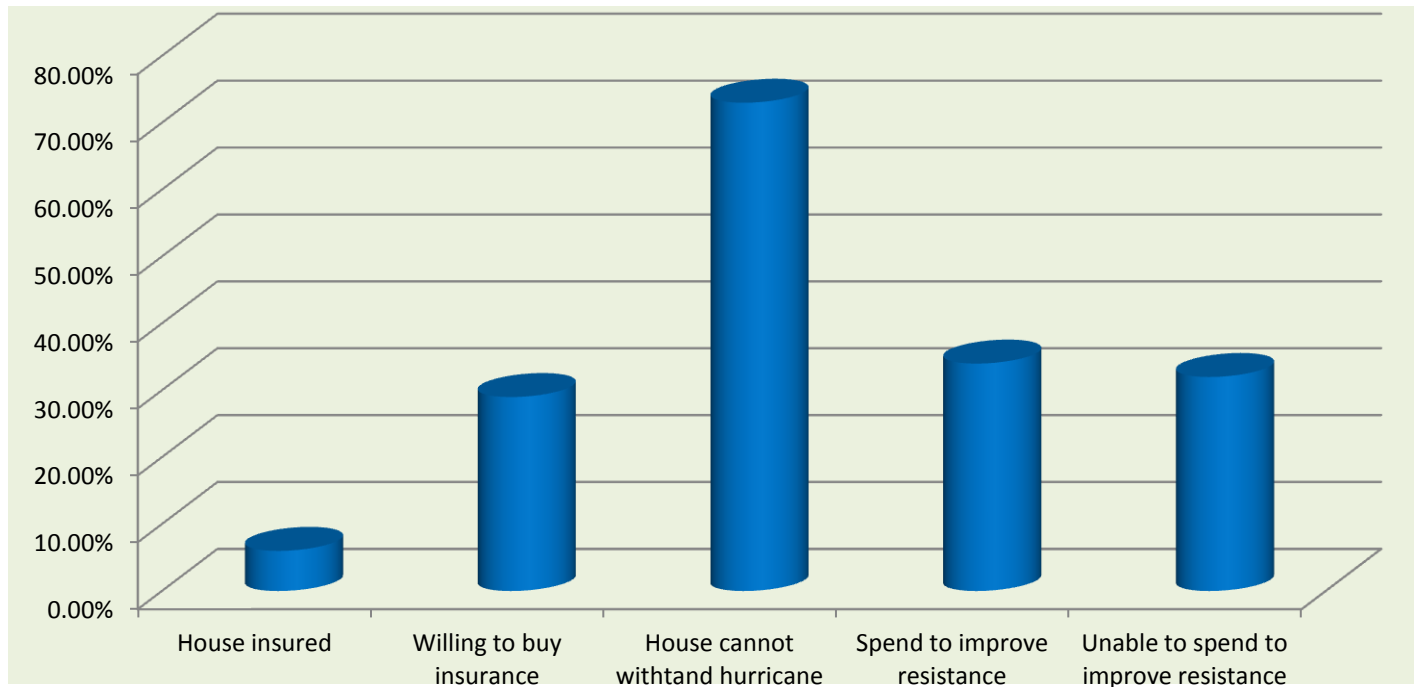


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Risk Mitigation and Management



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Research Results -Individual Perceptions / Behaviour

CATPCA indicated that:

- Respondents were generally of the view that the authorities are not well prepared for a major storm or hurricane.
- They were most pessimistic about adequate systems for evacuation and most optimistic about those for shelters.
- Persons that did not attend any school generally had no opinion. Pessimism decreased with higher education.
- Women and men had divergent positions on most measures of readiness.

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Research Results –Influence of Personal Attributes

- *Lifestyle:* Persons with a higher standard of living were more likely to know their shelter, expect to suffer severe disaster effects, take responsibility for mitigation, have their home insured, be prepared to pay for their losses and be optimistic about national preparedness.
- *Education:* Higher education is associated with a greater likelihood of always following warnings and updates, accepting responsibility for mitigation and funding losses and being willing to buy insurance.
- *Gender-* Women were more likely to follow updates and be willing to buy insurance.

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Research Results –Influence of Personal Attributes

- Age- Older persons more likely to follow warnings and updates; less likely to be willing to pay for their disaster losses, have insurance on their home or be willing to buy home insurance
- *Disaster experience*-a higher likelihood of always following warnings and updates, knowing the disaster shelter and expecting help from family and friends

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Research Results- Influence of Systemic Factors

Unregulated development in rural areas that have led to:

- Unapproved land use, proliferation of squatter settlements, developments in risk prone areas, increased flood and landslide risk
- Inefficient patterns of ribbon development that constrain infrastructure upgrade and the provision of emergency services
- Many structures are not constructed or altered to any required building codes, have no resistance to high winds

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Research Results- Influence of Systemic Factors

- ❑ Decline of agriculture leading to increased unemployment, underemployment and poverty which underpins illegal, poorly constructed homes in high risk areas
- ❑ Generally lower levels of education as persons seeking or acquiring higher education migrate to urban areas
- ❑ Little efforts individually or systemically to reduce vulnerability or mitigate expected natural disaster effects

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Implications for Mitigation

- Policy decisions and actions must include storm and hurricane hazard risk considerations. Without this building codes, land use and development, even if regulated, can cause a storm to be a disaster; noted that current 'disasters' experienced are caused by normal rain in the rainy season.
- Personal attributes should be considered in efforts to reduce the vulnerability of people and property; comprehensive mitigation plans should cater for the attribute profile of individuals and assess the best way to achieve the desired behaviour.

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Implications for Mitigation

- Recognition of this 'human condition' effect is likely to produce a better fit between people's attributes and disaster risk management policies and action.
- Profile audiences and tailor public disaster preparedness and mitigation education accordingly; more likely be effective than one size fit all
- A consultative rather than instructive approach to disaster awareness and mitigation programmes

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Implications for Mitigation

- Shift focus from preparedness and response to mitigation and ease the cycle of rain → flood → material assistance
- Along with enforcing new development codes etc., consider measures to enable persons to implement disaster mitigation as opposed to dealing with the effects; assistance in relocation, retrofitting
- Finalise and implement the agenda reflected in the Draft Spatial Development Plans for rural areas; with poverty reduction and improved infrastructure individuals may more disposed to mitigation.

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Thank you

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