

Weathering the Storm: Lessons in Risk Reduction from Cuba

Location:	Havana and other cities and rural communities, including Isla Juventud, Pinar del Rio, and Cienfuegos
Date:	2003
Sector focus:	Hurricane preparedness
Spatial focus:	National sample of urban and rural neighborhoods

Bibliographical reference

Martha Thompson with Izaskun Gaviria, *Cuba: Weathering the Storm: Lessons in Risk Reduction from Cuba*. Boston: Oxfam, America, 2004.

Link to document: www.oxfamamerica.org/newsandpublications/publications/research_reports/art7111.html.

Abstract

This was a multi-level, multi-method study of the elements involved in Cuba's system for protection human life during hurricanes. Conducted over several months in 2002-2003, it involved review of literature and reports, interviews with national officials of the meteorological service and civil defense, local officials, a variety of Cuban governmental and non governmental institutions, and citizens involved with neighborhood groups. Attention was paid to the intersection of meteorological science "from the top down" and detailed neighborhood vulnerability and capacity inventory "from the bottom up." The primary investigator also used her own experience and information gathers from living in Cuba during 2 Hurricanes, one in 1996 and one in 1998. In both occasions, as an Oxfam Program manager, she worked with the Cubans to fashion Oxfam's support to Cuba and therefore traveled a lot in affected areas and worked and discussed with officials, health workers, municipal officials and the cooperative associations in Matanzas, Cienfuegos, Sancti Spiritu, Trinidad and Havana province. In our research for the paper cited above as the case study, the team concentrated on Isla Juventud, Pinar del Rio, Havana and Cienfuegos.

Technical description

Hazard/risk type: Hurricane related hazards: wind hazard, storm surge, flooding, and landslide.

Type of assessment: Hazard assessment, institutional review, analysis of information flow and decision making.

CRA process

Focus group discussions with neighborhood groups, municipal and provincial authorities was the core of the CRA process, supplemented with institutional analysis based on interviews with officials and background data.

Methods used: Oxfam researchers used focus group discussion methods; while they report the use by neighborhood committees of house to house semi-structured interviews prior to the start of each hurricane season in which the presence of at risk persons or especially hazardous conditions is documented and then passed along to local authorities as part of overall pre-hurricane planning. The team also interviewed government officials and the actors in the neighborhoods and municipalities that carry out the hurricane response and preparedness.

Was livelihood analysis used? No, except for a section of the report that deals with recovery, during which there is state assistance for reconstruction. Voluntary labor is important in the reconstruction phase, and it is possible that one constraint on availability of voluntary labor is the demands of day to day livelihood activities. Despite this constraint there is an immense amount of voluntary labor. Because so many enterprises are state owned, other workers take on the responsibility of filling in for people who are volunteering, and people who volunteer have their salaries covered and have job security. There is a lot of support and encouragement for people to leave their jobs and volunteer on work crews. The idea is that those who don't do that participate by covering the work of their absent colleagues. This way everyone shows solidarity. This slows work/production of course but the Cubans see this as more efficient in the long run as they measure efficiency by social indicators not just monetary ones. Also people's food is guaranteed after a hurricane, so doing volunteer work does not endanger that. However with the economic situation, the people who are self employed feel more constrained about volunteering, since they do not have the job benefits offered to someone in the government sector.

Was external specialist knowledge introduced? The local civil defense committees, supported by provincial and national civil defense and meteorology staff provide neighborhood groups with detailed hazard maps and updates in real time of the approach of hurricanes. All of this is integrated in the system of evacuation to pre-prepared and known shelters.

Vulnerability analysis

Vulnerability analysis is a matter of the application of top down classifications of at risk persons and conditions to local situations by neighborhood committees – essentially as self-assessment at neighborhood level. The categories of persons considered at risk include those with chronic health problems, pregnant and nursing mothers, the elderly, people living with disabilities as well as anyone who lives in a zone mapped as likely to be flooded during a hurricane. Thus the analysis is based on social and environmental/ spatial criteria. This analysis is simultaneously crosschecked really by sector, professionals in health, education, labor, sociology, social workers etc in the neighborhoods also do the vulnerability analysis through their sectors, and that information is fed into the overall mapping. Cuban society has such a web of interrelated organizations that it helps close up the cracks people can fall through.

Capacity analysis

Resources available: For the study itself, Oxfam America funding and staff.

For hurricane preparedness: In the Cuban case, state resources are available and utilized; however, the system of hurricane risk reduction also depends on voluntary labor and initiative by neighborhood committees. Falling between public and private are also resources provided by mass organizations, especially the National Association of Cuban Women, who are active in educating

about hurricane risk and in facilitating evacuations. Human resources and social capital is therefore very important. These are organized at three import levels:

1. Mass organizations, including the Committees for the Defense of the Revolution at the neighborhood level;
2. People's workplaces, schools hospitals, factories etc which all have preparedness plans etc;
3. Government, both at the national level and at the municipal level (popular councils). That extension of government into neighborhood provides information to government officials.

Limitations to Capacity: During what the Cubans call the "Special Economic Period" since the end of special trading relations with the USSR and Eastern Europe, there has been much economic hardship. Thus individuals and households work very hard at numerous livelihood activities in order to maintain themselves.¹ Lack of building materials continues to be a problem in the country. This limits time available for voluntary activity such as survey of the neighborhood for vulnerable people and hazardous conditions. Economic hardship and lack of materials, also limits the ability of households to maintain structures, make repairs, and to strengthen elements such as roofs and window shutters, etc. The U.S. trade embargo continues to be a problem in accessing supplies. For example, when Oxfam Canada tried to buy chlorine for treating water after Hurricane Lily in 1998, they had to buy it through Spain and China as no Canadian company would sell it for use in Cuba because some of the components such as the containers were purchased from the U.S., and therefore the transaction would have violated the Helms Burton (embargo) act.

Action planning and implementation

What actions were actually planned? Annual neighborhood risk reduction and evacuation plans. At the national level there is an annual two day "meteorological exercise". It is carried out at municipal, provincial and national level including institutions such as the electric company, the gas and water companies which are all given mock scenarios to solve.

Were all actions actually carried out? Yes, on a very large scale, and very effectively. From 1996 through the midpoint of the 2005 hurricane season of 2004 Cuba lost only 34 lives in storms, a striking achievement when compared to the rest of the Caribbean and Central America and, indeed, when one considers that with much greater financial resources the U.S. suffered 307 storm deaths in the period 1996-2004² and thousands of lives in hurricane Katrina. Cuba's success has been based on pre-planning focused on neighborhood groups and timely evacuation. In 2005 hurricane Dennis killed 16 Cubans, a national tragedy and a departure from the pattern over the past decade.

Have these actions turned out to be sustainable? Yes.

Were there any unanticipated additional benefits of the actions? The success of neighborhood pre-hurricane planning and state-run evacuation has been one of the ways in which trust and confidence in the Cuban state has been maintained during a time of serious economic hardship. As a result, other neighborhood activities such as urban gardening and farmers markets have been quite likely better supported.

Were there any unanticipated negative consequences of the actions? A small minority of people resent evacuation orders and resists involvement with neighborhood groups, whose activities they perceive as intrusive and violations of their privacy; however, this is a very small minority phenomenon.

Limitations on action/ sustainability of actions: The ultimate limitation is the viability of the Cuba state under the economic and political pressures exerted by a large, hostile nearby nation state. Also, in the short run, economic hardship does erode the time people have available for the voluntary activities that are an essential part of this system. Ironically, if the economic situation were to improve due to partial introduction of free market relations (a process already begun on a small scale), the increased encouragement for individual accumulation and social differentiation this is likely to bring could further erode the base of the neighborhood groups.

Indicators

Crude statistics including the number of people evacuated, those injured, those killed during hurricanes are the main indicators used to evaluate the effectiveness of the whole pre-hurricane system, including its participatory neighborhood component. More sensitive indicators of people's satisfaction with their neighborhood system, with shelter conditions, etc. do not exist; however, in principle, such data could be collected and analyzed by civil defense authorities with the assistance of Cuba's national universities and research institutes focusing on social work, psychology, and sociology.

Contextual notes

Existence/ role of prior or contemporaneous conflict? The whole of social life in Cuba is played out to some degree against the history of the Cuban Revolution (1959) and, in particular, the unsuccessful Bay of Pigs invasion (1961). The neighborhood groups are called "Committees for the Defense of the Revolution," and their history goes back to those early conflicts.

Role of displacement/ relocation? No.

Role of prior disaster & prior recovery attempts? Cuba has a long history of devastating hurricanes. As recently as 1963 over one thousand people died in a hurricane. Public risk communication involves playing historic footage on national television of past destructive hurricanes. The history of hurricanes in Cuba is taught in school as well. One might even say that Cuban history has been partly shaped by killer hurricanes such as struck in 1842, 1844 and 1846.³

Significant historical, geographic, economic, political, or cultural issues that influenced this instance of CRA and its consequences? See above.

Strategic notes

How has this practice of CRA influenced change in policy and practice at the national level? The system described in this case study is a fully national system.

How has this practice of CRA influenced change in policy and practice at local level? This system has components that bridge national, provincial, local, and neighborhood levels. Each year planning is conducted before the hurricane season and the results are analyzed after the hurricane season, with adjustments made according to experience.

How has this practice of CRA influenced the level of organization and solidarity in the locality where it was carried out? As notes above, pre-hurricane planning is one of the more successful and popular functions of the neighborhood committees that may well be a positive force maintaining the vitality of such committees at time with several social and economic forces are tending to erode voluntary activity and participation.

Less divided along class, gender, age, ethnic lines? Since the CRA process is spatially discrete and focused, and since social differences in Cuba translate into spatially different residential areas, CRA does not usually function as an "equalizer." It is an equalizer in the fact that everyone gets access to the same protection and great attention is paid to the most vulnerable.

More divided along these lines? No.

Have new civil society organizations been created directly or indirectly because of this practice of CRA? No.

Lessons learned

While there cannot be a universal recipe for effective early warning, some essential ingredients of the Cuban approach are not only relevant but replicable:

- ♦ Generation of and access to excellent hurricane warning and prediction information.
- ♦ A system of governance and civil protection from national to local level, which is coherent, well-coordinated, proactive, responsive and accountable.
- ♦ Ongoing risk awareness, practice drills and preparations, based on universal educational access and literacy.
- ♦ Close integration of the media into the warning system.
- ♦ Strong neighbourhood organizations and participation of youth, women's and professional organizations.
- ♦ Investment in public transport, shelters and emergency provisions.⁴

Keywords

Hurricane, national warning system, neighborhood self assessment, evacuation, social vulnerability, spatial exposure

Resource person(s)

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¹ Jonathan Curry-Machado, *Surviving the 'Waking Nightmare': Securing Stability in the Face of Crisis in Cuba (1989-2004)*, London School of Economics, Crisis States Programme, Working Paper No. 64 (June 2005) www.crisisstates.com/download/wp/wp64.pdf .

² See Ben Wisner, Lourdes Meyreles, Allan Lavell, and Victor Ruiz, chapter on the effectiveness of warning during the 2004 hurricane season in the Caribbean (comparison of Cuba, Haiti, Dominican Republic, Jamaica, and Grenada). *World Disaster Report 2005*. Geneva: International Federation of Red Cross and Red Crescent Societies.

³ NASA, "Scholar: Hurricanes Helped Shape Cuban Culture, History," *Earth Observatory* 29 November 2001 <http://earthobservatory.nasa.gov/Newsroom/MediaAlerts/2001/200111295373.html> .

⁴ For more detailed discussion of lessons see Ben Wisner, Lourdes Meyreles, Allan Lavell, and Victor Ruiz, 2005 *op. cit.*

Weathering the Storm: Lessons in Risk Reduction from Cuba

Location: Havana and other cities and rural communities, including Isla Juventud, Pinar del Rio, and Cienfuegos

Date of update: 27 August 2008

Background

In 2003 a team supported by Oxfam America studied Cuba's hurricane preparedness and recovery system. The interviewed people and held discussions from bottom to top, and top to bottom of the island's integrated preparedness, warning, response, and recovery system. They found that a high level of citizen confidence in the national warning system plus universal literacy and high levels of education made it easier to mobilize people to prepare for annual hurricane hazards. They also found that the decentralized yet integrated system was effective, and that the street committees were one of the keys to success – measured a very few fatalities in hurricanes over the past two decades.

Update Time Frame, Mode of Follow Up & Confidence Level

The update comes five years after the original study. The core of the update comes from email correspondence with Dr. Enrique Castellanos, a geologist working on multi-hazard risk assessment, a Cuban with work experience there and PhD from ITC in the Netherlands (castellanos@itc.nl & <http://eacastellanos.googlepages.com/>), someone very familiar with Cuba's civil defense system. In addition, secondary literature on Cuba's experience of the hurricane seasons since the study have been reviewed, including one study that involved field interviews in Cuba that confirmed the original Oxfam America team's findings.¹

Sustainability

Cuba shows evidence of continuous development over a long period of a multi-sectoral, multi-hazard civil defense system. This began as the island's self-defense system during the Cold War, and even

¹ Wisner, B., Ruiz, V., Lavell, A. and Meyreles, L., 2006. 'Run, Tell your Neighbour: Hurricane Warning in the Caribbean', in: IFRC, *World Disaster Report 2005*, pp. 38-59, IFRC, Geneva.

today people are aware and proud of its origins and successes (such as defense of the island during the Bay of Pigs invasion). After hurricane Flora in 1963, the system was extended to include natural hazards (<http://www.cubahurricanes.org/history-hurricane-flora.php>). Flora killed 1,750 people in Cuba.

The system described and evaluated by Thompson and her team in 2003 still functions and has been reinforced by publication of new handbooks and guidelines by the national office of civil defense (Estado Mayor Nacional de la Defensa Civil) in 2006 and 2007. As late as August 2008, when tropical storm Fay slammed into the island, the warning, evacuation and sheltering system remains effective (<http://www.reliefweb.int/rw/rwb.nsf/db900SID/AMMF-7HMC46?OpenDocument>). The storm passed over the island on 18 August 2008; no one died, and injuries were minor (<http://news.bbc.co.uk/2/hi/americas/7568277.stm>).

Figure 1: The Path of Tropical Storm Fay

Source: NOAA cited by BBC

<http://news.bbc.co.uk/2/hi/americas/7568277.stm>



Actions implemented

The annual nationwide hurricane preparedness drill has continued each May, most recently on 23 May, 2008 (<http://www.granma.cubaweb.cu/2008/05/26/nacional/artic06.html>). At the same time that significant changes in the top leadership of Cuba and also some liberalization of the economy have been taking place over the past five years, the street committees remain an important part of the hurricane risk reduction system. This annual exercise is gradually being extended to include multiple hazards beyond hurricane-related ones.

In 2005 risk assessment for the each community nationwide began to be implemented. It was ordered by Raul Castro following the critical internal evaluation of large economic losses due to natural hazards in 2004. The order was called "Directive 1" and it was followed with a 84 pages manual explaining conduct risk assessment at the community level with participation by ordinary citizens. Three organizations were also created. National civil defense now has a new department for risk assessment. At every level there are "centers for risk management" attached to the local government (one national, 14 provincial and 169 municipal (however, at the municipal level they are still under construction). The Ministry of Science, Technology and Environment created a national

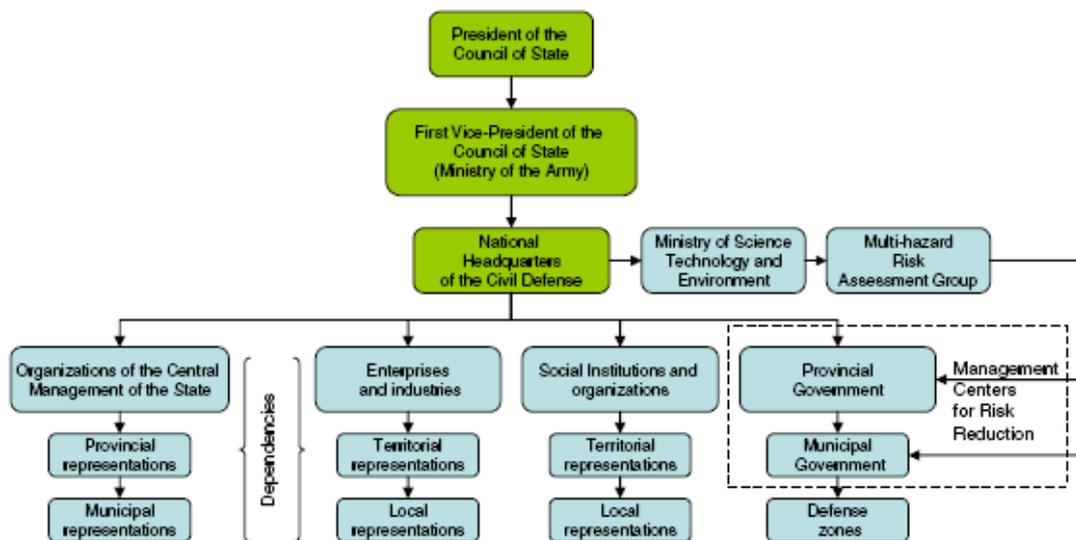
group for multi-hazard risk assessment in order to support and to coordinate community risk assessment.

At the national level, the whole civil defense system has been analyzed and strengthened, following the schema below (Figure 1).

Under this system there is a detailed risk assessment process that applies not only to residential areas about is part of the screening of any infrastructural investment project before it is undertaken. The most recent developments of the risk assessment system has devolved hurricane related hazard assessment to the local level, providing guidelines for matching the local flooding map with the flooding model based map generated by professionals. Every local civil defense team has a flooding map based on previous floods.

Figure 2: Structure of Civil Defense in Cuba

Source: E. Castellanos, ""Spatial landslide risk assessment in Cuba", PhD dissertation, ITC, Enschede, Netherlands, 2008 (based upon diagram in Cuban National Civil Defense Office, *Manual General de Defensa Civil*, General Manual of Civil Defense], Havana, 2007).



Welfare/security results

The relatively low number of fatalities in Cuba due to hurricanes reported in the case study continued in the years since. The international disaster data base, EM-DAT, gives a total of storm-related fatalities in Cuba² for the period 2000-2008 as 33, while the total for the Caribbean region was 3,300.

² In addition to engaging in multihazard risk assessment, the Cuban civil defense system began a nationwide disaster data base in 2008. The design phase will end in October, 2008, and then they will begin systematic the data collection. It will be an online resource accessible in its entirety to each province.

Figure 2: Hurricane Deaths in Cuba 2005-2008 vs. Other Caribbean Islands

<u>Year</u>	<u>Deaths in Cuba</u>	<u>Caribbean</u>
2005	20	108 ³
2006	0	5 ⁴
2007	1	277
2008 ⁵	NA	NA

The trend of effective life safety measures has continued into 2008. In August of that year, tropical storm Fay killed dozens in Haiti and four in the Dominican Republic but no one in Cuba.

Replication of method/approach

This question has two parts. First, the methods used by the Oxfam America team are simple and easily replicable. In fact, one member of the team that investigated the 2004 Caribbean hurricane season's warning performance on four islands structured interviews down the hierarchy of Cuba's civil defense system in a similar way.⁶ A second, more difficult question concerns replication of Cuba's hierarchical, science based, and participatory system. Some have argued that this is possible only in an authoritarian state system.⁷ An historicist view might argue that without the strong self defense culture built up over 50 years under the perceived threat of invasion, the system would not have survived and thrived, so under more peaceful circumstances in another country, with another history, such a system is unlikely to take root.

Nevertheless, almost 20 years into the economically stressful period for Cuba since the end of its special relation with the USSR and the COMECON economic block, and several years into a period of political change and economic liberalization, the island's civil defense system still seems robust. It could be, therefore, that the democratic centralist model of participatory action research is viable elsewhere. That is, a strong state and integrated, decentralized, accountable system of risk governance is capable of entering into dialogue with local people about risk and preparedness for risk. Pre-requisites seem to be mutual trust between citizens and the state, moderate levels of popular literacy, numeracy, and scientific awareness (hence a strong public school system), and

³ This does not include the 1,500 deaths mostly attributable to hurricane Stan's impact on Guatemala, and it does not count the 1,300 deaths in the U.S. from hurricane Katrina (<http://www.reliefweb.int/rw/rwb.nsf/db900sid/EGUA-6JNNKV?OpenDocument>).

⁴ Occurring in Haiti

⁵ August 2008, half way through the hurricane season, EM-DAT data not available. However, scanning news web sites, there had been at least 36 fatalities, including more due to storm-triggered landslides in Guatemala, and no fatalities yet in Cuba.

⁶ Team member, Victor Ruiz, conducted field work, and the results are available in the publication cited in footnote 1 above.

⁷ Glantz, M.H., 'Usable Science 8: Early Warning Systems, Do's and Don'ts'. Report from the workshop held 20–23 October 2003. Shanghai, China. Boulder, CO: National Center for Atmospheric Research, 2004.

strong public health and communication systems so that sectors can actually deliver once agreements with citizens on contingencies for evacuation, etc. have been made.⁸

Lessons learned/open questions

While there cannot be a universal recipe for effective early warning, some essential ingredients of the Cuban approach seem not only relevant but replicable:

- Generation of and access to excellent hurricane warning and prediction information;
- A system of governance and civil protection from national to local level, which is coherent, well-coordinated, proactive, responsive and accountable;
- Ongoing risk awareness, practice drills and preparations, based on universal educational access and literacy;
- Close integration of the media into the warning system;
- Strong neighborhoods organizations and participation of youth, women's and professional organizations;
- Investment in public transport, shelters and emergency provisions.

Author of Update

The ProVention Consortium contracted Ben Wisner to author this update.

⁸ International Journal of Cuban Health and Medicine, Theme Issue: *Strategies for Disaster Management*, Vol. 10, No. 3 (2008) <http://www.medicc.org/mediccreview/> . See also profile of Cuban health and health care system at Pan American Health Organization site <http://www.paho.org/english/sha/prflcub.htm>.