

# Hurricane Early Warning in Cuba: An Uncommon Experience

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## Introduction

Hurricanes are one of the more deadly natural disasters and are likely in the area of the Tropical Atlantic and the Caribbean, they are the deadliest. In the USA, for instance, their damages exceed those due to other hazards. In other countries in the area, damages are simply enormous, remember Hurricane Mitch that in 1998 killed thousands of people in Central America.

In a hurricane, we find almost all kinds of weather disasters: very strong winds, heavy rains, floods, high sea, tornadoes. But strong winds are considered their main and most dangerous characteristic and then they are classified by the maximum wind speed in 5 categories called the Saffir-Simpson Scale. Most dangerous hurricanes are those in categories 3, 4 and 5.

One of the more recent examples was Hurricane Isabel, which last September battered the Atlantic coast of the United States. Only a few days before, Isabel was a category 5 hurricane; however when it reached the coastline, it was only a category 2. Despite the weakening, Isabel killed 23 people and left millions without power. It is interesting to note that only 24 hours previous, the impact the National Hurricane Center showed much hesitation in their official advisories.

In November 2001, a category 4 hurricane named Michelle pounded Cuba. Losses were so big that its historical enemy (United States) took a break in the economic embargo which last more than 40 years and helped to sell food to Cuba.

However, Cuban authorities faced the hurricane, taking important protective measures and evacuating more than 700,000 people. As a result only 5 casualties were reported.

A very small number of casualties in Cuba during hurricanes has become usual in the last decades. Comparison with other poor countries in the area is simply dramatic and only human losses in the USA could be considered to compare. As a result, the Cuban experience has created strong controversies among politics and researchers; some of them have called for a careful look at risk reduction policy in socialist countries.

In the Cuban case there are a variety of multifactorial causes behind these results. They can be resumed by considering three main components from IDNDR: (1) the public's awareness of hazard risk; (2) public policy commitment; and (3) applied scientific knowledge.

## Public Awareness of Hazard Risk

This component has been very important in Cuba to stimulate self-preparation of the population. In fact, Cuba traditionally has maintained a relative low record of casualties in relation to its neighbors. Statistically, one tropical cyclone hits Cuba every two years. From 1888 to 1998, Cuba was affected by 11% of the hurricanes generated in the Atlantic and consequently, society has developed adequate perceptions about hurricane threats.

The four deadliest hurricanes of the last century in Cuba and the USA serve to illustrate the former. As is shown in the following tables, casualties in Cuba remain in all cases lower than in the US, although the hurricanes of 1926 and 1944 hit Havana City, the most populated city in the Caribbean.

CUBA		USA	
Year	Deaths	Year	Deaths
1932	3500	1900 (Galveston)	8000
1963	2000	1928	1836
1926 (Havana)	600	1938	680
1944 (Havana)	300	1919	600

Of course, this is may not be the only reason but when people have an adequate idea about risk and how to proceed, they have more chance to stay alive.

## **Public Policy Commitment**

The second component has a very special behavior, maybe unique. Cuba is a socialist country, a survivor from the socialism crash of the 1980s and 1990s. Its political structure is based on a centralized and long-lasting one-party communist government with no significant internal political struggles, which are very common in other countries. Such institutional stability highly favors the development of long-term plans, which can be applied and monitored in society in a practical undisturbed way for many years.

The hurricane coping capacity is considered, as well as education and health, as a piece of the ideological struggle between capitalism and socialism. Government caring about its people is not only symbolic or altruistic, but is also a practical action that proves the superiority of the Cuban system vs. neighboring countries.

Since the onset of the socialist government in the 1960s, Cuba has been immersed in a historical conflict with the US government which maintains a severe economic embargo against Cuba (Cubans claim it as a blockage). As a consequence of this conflict, Cuban society is highly organized under the umbrella of a military doctrine in order to face eventual US aggression. Response plans are included into this doctrine to take advantage from the system.

## **Applied Scientific Knowledge**

The third component is maybe the least known of all. Cuba has a traditionally high level of scientific knowledge about hurricanes.

Over the nineteenth century, the Spanish government and the Catholic Church developed in Havana the first meteorological service in the Caribbean region. During the early twentieth century, the technical capability of Cuban meteorology led the US in hurricane monitoring.

This development brought some conflict with the American Weather Service, mainly because the Cubans were extremely good at predicting cyclones - way better than the US could hope to be. As early as 1870 they had set up a network of hundreds of observers and runners that were well trained and dedicated to the job. Their director, Father Benito Vines, dedicated his life to cyclone prediction and enjoyed great success.

After the disaster of Hurricane Flora in 1963 (more than 2,000 deaths) the Cuban government, supported by the former Soviet Union, undertook a serious effort to improve the national meteorological service. Soon, Cuba became self-sufficient in warning capability, and in the wake of the US-Cuba conflict, during the 1970s and the 1980s, the relationship between the NHC and the Cuban meteorological service reached its historical lowest point.

## **How the Early Warning Chain Works**

The Institute of Meteorology of Cuba possesses the leadership in hurricane predictions and monitoring as a function of the Cuban State. Its monitoring facilities are based on a network of more than 120 stations, 5 radars and operational access to satellite pictures. Operational forecasts are supported by their own hurricane prediction methods. In fact, Cuba is one of the few Western Hemisphere countries with major scientific research about hurricanes.

Over these bases, the meteorological service has developed its own advisory system with some resemblance to the NHC, releasing one advisory every 12, 6, or 3 hours, depending on the level of threat. Cuba has a warning system that is activated by a national defense council. Functional and structural organization is built into the law for the national defense of 1997. The highest levels of that system are the president of the government and the Minister of Defense.

The system is structured in "defense zones" spread throughout the country. It allows the system to send information to the governments of provinces and municipalities. The main economic and social concerns under risk maintain direct phone lines to the centers of the Civil Defense. Broadcast radio and TV networks and newspapers are public services fully controlled by the government. There are not private networks. Under a hurricane warning, all media are fully subordinated to the national defense council to play a role in disseminating warning and instructions for the public.

Cuban disaster management organization is not only focused on emergency response but also in risk reduction activities. Preparedness plans are designed to build capacities in local and rural areas under risk, to take measures. Although preparedness plans are established under military decision-making practices, military and civilian structures in the Cuban society practically overlap, ensuring a strong coordination between them. The internal Cuban economy remains highly centralized and government dependent; individual owners are practically reduced only to small business. Under these conditions resources, infrastructures and transportation for evacuation and other protective measures come from only one source.

## **Conclusions**

Cuba's experience is hard to be fully applied in a western-type society because it is supported by very different societal and economic bases. Undoubtedly, ideological basis, societal and economic structures performed under a communist government tends to favour its capability to take actions directly on any social or economical activity. However, in the Cuban case, the conflict with the United States and the embargo establish important singularities. A society severely stressed by an economic embargo, among others factors, has to be very concerned about natural disaster impacts. Besides, under a strong ideological struggle against capitalism, the Cuban government considers itself under a

permanent military aggression risk, developing a military doctrine which involves every stage of society creating quick reaction capacities for emergency response. In fact, Cubans have been forced to be more efficient in facing natural disasters in a scenario of political conflict with the US government. This is maybe an opposite view of the disaster diplomacy approach. Protective measures under a conflict are developed in such a way that the enemy would not be able to take advantages from the disaster. In the Cuban experience, not everything is politics. There is a solid historical background of social awareness about hurricane risk and technical capabilities in hurricane warning that it may be unique in the Americas.

Despite singularities, some lessons could be established from the Cuban experience in EWS. A strong societal awareness could be constructed over public perceptions of risk. This is a long term educational task in many countries under hurricane risk. Poverty, isolation, lack of education, and inclusive traditional feelings about fate are major obstacles to reach this goal.

The development of capabilities in hurricane monitoring and prediction are a crucial matter to reach an effective EWS. Almost all countries in the Caribbean and Central America area are highly dependent on the NHC products in the framework of the WMO region IV coordination. This ensures access to basic information. However, under the direct impact of a hurricane, national monitoring capability plays the main role, and many countries are not able to assume this responsibility.

Regarding this last topic, the National Hurricane Center plays a very important role in the Early Warning System strategies in the Caribbean, including Cuba. However, this role cannot be a substitute for those of the national weather services. Unfortunately, many governments in the area do not have a strategy to build capacities and leave almost all warning responsibilities to the NHC.

The achievement of adequate EWS is only possible when national authorities (political, public and private, all together) have the will to make a sustained commitment in establishing measures to educate and protect people. And this is the most difficult task.. It may be unreachable for many countries in the current century...