

# Hurricane warning

## Hurricane preparedness for the fisheries sector in the Caribbean Islands is not uniformly strong

A hurricane is a warm-core tropical cyclone in which the maximum sustained surface wind is 74 mph (or 119 kph). The term hurricane is used for Northern Hemisphere cyclones east of the International Date Line to the Greenwich Meridian.

A hurricane's spiralling bands of winds and rain can extend hundreds of miles from the calm eye. Besides strong winds and heavy rains, storm surges as high as 20 ft (6 m) and flooding of low-lying coastal areas accompany hurricanes. Although the 'hurricane season' in the Caribbean extends from 1 June to 30 November, according to historical records (1885-1996), most storms occur in August, September and October.

Hurricanes are classified in terms of their intensity which reflects the amount of damage they may cause. Forecasters rate the severity of hurricanes using the Saffir-Simpson Hurricane Scale of 1 to 5, with five being the strongest.

Category	Wind Speed (mph)	Storm surge (ft)	Damage
1	74-95	4-5	Low
2	96-110	6-8	Moderate
3	111-130	9-12	Extensive
4	131-155	13-18	Extreme
5	> 155	> 18	Catastrophic

Table I. Classification of Atlantic Hurricanes

The National Hurricane Centre in Florida, US, maintains a continuous watch on tropical cyclones over the Atlantic, the Caribbean, Gulf of Mexico and the Eastern Pacific from 15 May to 30 November, and issues watches, warnings, forecasts and analysis of hazardous weather conditions.

Agriculture, forestry and fisheries are important economic activities in the Caribbean islands, even in those islands where their contribution to the GDP is small. These sectors are critical to foreign exchange, rural and coastal development, food supply and security, employment and culture. They are, however, vulnerable to hurricanes, storms and other rough sea events.

In the Small Island Developing States (SIDS) of the Caribbean, vulnerability is accentuated by smallness of size, to the extent that a single disaster may entirely cripple an economy and society for a considerable period. Evidence is provided by the recurrent requests to FAO for emergency assistance to rehabilitate the agriculture sector and to strengthen both national and regional capacities to cope with disasters due, in particular, to hurricanes.

Measures for preparedness, impact mitigation and management of the effects of hurricanes must be based on regional, national and community-level capacities to plan for, and respond to, such emergencies. Currently, the governments of Antigua and Barbuda, Barbados, Dominica, Grenada, St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, and Trinidad and Tobago are receiving FAO's technical assistance in formulating national action plans and mitigation measures to deal with the threats posed by hurricanes to agriculture, forestry and fisheries.

### Estimated damage

Estimated damages to the fisheries sector in some Caribbean SIDS by recent Atlantic hurricanes are given in Table II. It should be pointed out that, since 1985, there has been no loss of life of fishers at sea, even though 640 deaths due to hurricanes were

Table II. Damage Estimates of Recent Atlantic Hurricanes to the Fisheries Sector in Some Caribbean Islands

Island	Population	Land Area (sq. km)	No. of fishers	Hurricane category	Date	Damage estimates
Dominica	78,000	750	1,700	Iris - 1 Luis-4 Marilyn- 2-3	22 Aug/4 Sep 1995 27 Aug/11 Sep 1995 12/22 Sep 1995	Damage to landing sites and boats; loss of boats, engines & gear; loss of earnings. Total financial loss of fishing effort us\$1.4 million
Antigua & Barbuda	80,000	442	1,200	Luis - 4	27 Aug/11 Sep 1995	34 vessels destroyed; 79 severely damaged; 6 lost at sea; 11,000 fish traps lost; 5 long lines lost; damage to onshore infrastructure. Total us\$ 1.6 million.
St. Kitts/ Nevis	46,000	360	850	Luis - 4	27 Aug/11 Sep 1995	Total agriculture sector damage us\$ 14.3 million. 12 boats damaged; 2,247 fish traps lost. 350 fishers affected. Damage to fisheries sector us\$ 82 million
Antigua & Barbuda	80,000	442	1,200	Georges - 4	20-21 Sep 1998	1 vessel destroyed. 1 lost at sea; 18 severely damaged; 11,017 fish traps lost; damage to onshore infrastructure; Total us\$ 1.3 million
St. Kitts/ Nevis	46,000	262	850	Georges - 4	20-21 Sep 1998	Total agriculture sector damage us\$ 10.9 million. 120 fishers affected; 10 boats damaged; 1500 fish traps lost. Damage to fisheries sector us\$ 25 million

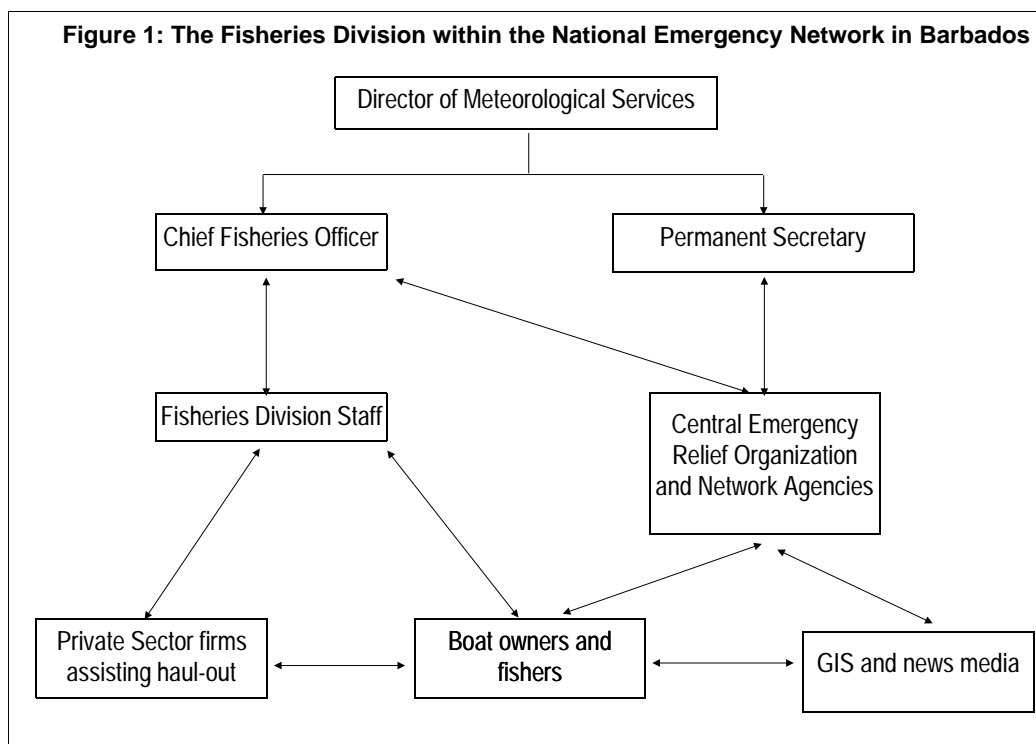
Source: FAO 1998

recorded between 1985 and 1998. The early warning system in place, where advisories are provided in stages depending on the level of certainty with which the weather system approaches the particular locality, has contributed to preparedness.

There is a 'Bulletin', then an 'Advisory', then a 'Watch', and finally a 'Warning'. A 36-hour notice is usually given to the public explaining where the 'eye' of the hurricane is expected to make landfall and the area the gale force winds would affect. However, damages to landing sites, boats, loss of gear and engines have been

extensive, although the early warning system is in place. From Table II it can be observed that most of the fishing gear lost are fish traps/pots constructed from galvanised chicken wire. The size and bulk of the fish traps, compared to the size of vessels and deck space, has restricted fishers from retrieving them before a storm strikes, so only a few traps can be retrieved per trip.

In addition, the distances to fishing grounds, in some islands, are significant. On average, most artisanal fishers deploy about 75 to 100 traps. When the trap is lost, it may still continue to fish for 9 to 12



months, that is, until the wire mesh corrodes enough to collapse the trap. This type of fishing is called 'ghost fishing'.

**T**o address this problem, attempts have been made to introduce biodegradable material panels in fish traps, collapsible fish traps held in the fishing mode by biodegradable cord, and methods of anchoring traps to prevent loss due to strong currents and undersea surges generated by hurricanes and storms.

It appears that most fishers do not activate their disaster preparedness plan until the Advisory becomes a Watch or a Warning. This effectively leads to a level of haste and unpreparedness. This late action, which could be understandable from an economic point of view, constrains fishers from activating their safest response.

However, from Table II, it can be observed that the 1998 estimated loss in the fisheries sector for the islands of Antigua & Barbuda and St. Kitts/Nevis was less than the 1995 estimate. This could be attributed to an improvement in preparedness and awareness.

Each Island country has a national co-ordinating agency for disaster preparedness. In Barbados, for example, it is called CERO (Central Emergency Relief

Organization), in Grenada it is known as NERO (National Emergency Relief Organization) and in the US Virgin Islands it is known as the VITEMA (Virgin Islands Territorial Emergency Management Agency).

The publication, *How to Prepare Your Vessel to Survive a Hurricane in the US Virgin Islands*, produced by VITEMA, while aimed at recreational crafts at that location, contains information relevant to vessels in other parts of the Caribbean. It states that "there are five main elements to hurricane survival: safe harbour, careful preparation, proper anchoring gear, adequate knowledge on how to deploy the anchor gear effectively, and luck. The publication admits that a vessel's chances of surviving a direct hit by a hurricane are slim.

#### Agencies responsible

The line agency responsible for fisheries (namely, the Fisheries Divisions/Departments) are directly responsible for safeguarding the fishing fleet and for responding to the fishing community in the event of a disaster. To do this, the fisheries division interacts and communicates with a number of other agencies in the national co-ordinating agency's network and the private sector. A simplified illustration of these relationships in Barbados is in Figure 1.

At the ministerial level there is co-ordination between ministries and their statutory bodies through various National Committees. The fisheries division is usually represented in some of the Committees. NGOs, such as amateur radio and citizens' band radio operators, and the Red Cross, are also linked to the national emergency network. At the regional level, co-ordination is achieved through the Caribbean Disaster Relief Organization (CDERA).

**I**n most islands, the national disaster co-ordinating agency publishes a set of 'Mobilization Procedures' which outlines the functions of the fisheries division and other organizations in its network, at different stages of preparedness and response. The responsibility of the fisheries divisions usually includes fishing vessels, gear and equipment, but does not include the broader issues of food security and emergency funding. It should be pointed out that in most countries no funds are specifically allocated in the annual budget of the fisheries divisions for disaster preparedness. Funds are usually derived from general operating expenses, and maintenance or rental of property.

Most fisheries divisions follow an annual cycle of hurricane preparedness. The cycle of hurricane preparedness for Barbados is shown in Table III.

Jan	Period of relative inactivity
Feb	
Mar	Pre-season servicing of equipment; procuring of supplies for hurricane season; Formulation of hurricane preparedness plan
Apr	
May	
Jun	Preparedness exercises and tests; maintain state of preparedness
Jul	
Aug	
Sep	
Oct	Hurricane season evaluation
Nov	Post-season servicing of equipment
Dec	

Table III: The Annual Cycle of Hurricane Preparedness in Barbados

In addition to safeguarding the fishing fleet, the hurricane preparedness plans usually contains measures, and allocates staff to secure property and records of the fisheries division as required of all government offices.

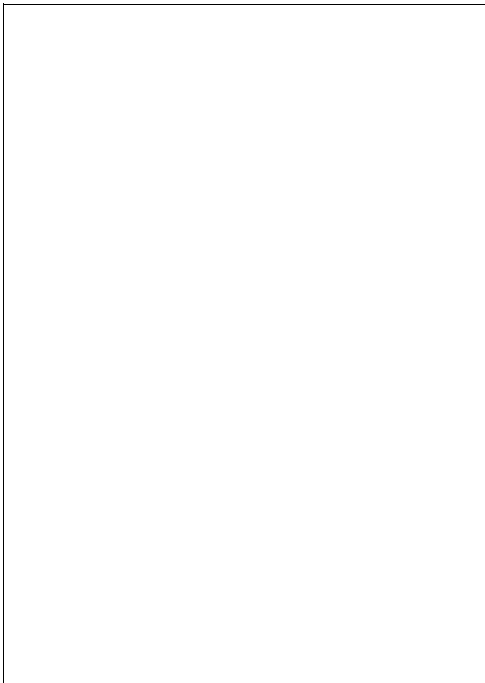
In most islands, a VHF radio network system designed to provide day-to-day link within the fleet and ship-to-shore linkage are in place. In some islands, such as Grenada and St. Lucia, the fisheries division is responsible for maintaining the Network.

An important feature of the VHF radio network in Grenada is a 'phone-patch' maintained for channelling, twice daily, weather reports to the fishing community, one around 06.00 hrs and the other at 18.00 hrs, approximately. This phone-patch is maintained at the home of a fishing technologist. A private operator (Vega One) also maintains a daily weather system. The phone-patch of the Fisheries Division merely relays reports from the Meteorological Office, while the private operator interprets weather reports sourced elsewhere.

The communication of preparedness information to the fishing industry and general public is done through different media. In addition to pamphlets, posters and hand-outs, communication with the fishing industry on preparedness has been through:

- call-in radio programmes;
- special hurricane supplements in the newspapers;
- lectures organized by the fisheries division or the national emergency agency;
- brief informative spots on television; and
- word of mouth from extension officers and others.

Despite the variety of delivery formats and methods, there is the general perception that people in the fishing industry are not adequately prepared for hurricanes. The degree of preparedness is, as expected, higher in islands such as



Antigua and Barbuda, and St. Kitts and Nevis, which have recently (1995, 1998) experienced hurricanes than in islands such as Barbados and Grenada which experienced tropical storms about ten years ago.

Generally, boatowners and fishers were aware of the fisheries divisions' preparedness plans, and most knew what they wished to do in the event of a hurricane or rough seas. However, few had actually written down instructions, made arrangements with colleagues for assistance or practised their course of action to determine feasibility.

Governments of the region, through the national disaster co-ordinating agencies and the fisheries divisions, should improve current efforts at hurricane preparedness in order to further diminish the loss and damage due to hurricanes, storms and rough sea events, through the following:

- Elaboration of a more comprehensive disaster preparedness plan for the fishing industry. The plan must include measures to promote greater preparedness in order to minimize damage to the capital stock of the fishing industry, including fishing traps. The use of coastal space for securing boats, emergency funding and the post-harvest

sector should also be addressed in the plan

- Where it does not exist, a VHF or HF bands radio network should be put in place to provide weather advisory bulletins and ship to shore linkages;
- A programme of public education and training for fishers and the fishing community should be organized to generate more awareness of the fisheries sector disaster-preparedness plan, and for the preparation of an individual written plan, which should be practised every year;
- Allocation of funds annually for disaster preparedness and simulation exercises to fine-tune the fisheries sector disaster-preparedness plan;
- Integration of fisherfolk organizations and fishing communities into the preparedness plans; and
- A group vessel insurance scheme for fishing vessels should be put in place. A regional insurance scheme is recommended in order to generate numbers so as to minimize insurance costs.

A loan scheme, through development banks or fisher organizations, to be used in times of disasters for the replacement of the productive capacity (boats and gear) of fishers. ¶

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