FACTS ABOUT NATURAL HAZARDS IN TONGA

Tonga is vulnerable to a number of natural hazards due to its location and topographical nature. The main hazards are earthquake, tsunami, tropical cyclones and drought. With the increasing global reach of viruses in the world today, an additional hazard includes the Ebola virus. It is important that the people of Tonga understand what these hazards are, how they come about, the impact of these hazards and how to prepare for them. The following includes some important facts about hazards. However it is advised that you seek information beyond this fact sheet to understand the hazards and the implications fully and your responsibilities in keeping you and your family safe.

EARTHQUAKES

Four out of 5 of the world's earthquakes take place along the rim of the Pacific Ocean, a zone called the Pacific Ring of Fire. Sometimes there are many small earthquakes before the big one. These small ones are called foreshocks. After the big earthquake, the main shock, again there may be many small quakes. These are called aftershocks. Most earthquakes last a minute or less. Many earthquakes happen on the ocean floor. Big ocean waves can form after an earthquake resulting in a tsunami. The main killers in earthquakes are falling buildings, fires, landslides, avalanches and tsunamis.

What do I do during an earthquake?

- If you are outside, move away from power lines, trees and buildings.
- If you are inside, stay away from windows, mirrors, cupboards, and shelves.
- Seek shelter under a door frame, table, desk, bed or bench. You can also stand under a doorway, they are one of the strongest foundations of a house.
- Be prepared for possible shaking after the main quake.
- If you are in a high building, stay out of the elevators and stairways.

Prepare for an earthquake by having flashlights, helmets and sturdy shoes, a first aid kit, a fire extinguisher, bottled water, canned food and a can opener.

TSUNAMI

A tsunami is caused from anything that rapidly displaces a large volume of water. Typically, tsunamis are caused by underwater earthquakes, but landslides, volcanic eruptions, calving icebergs, and (very rarely) meteorite impacts can also generate tsunamis. These types of events can cause large disturbances in the surface of the ocean causing large volumes of water to move.

How can I prepare for a tsunami?

It is difficult to give a lot of warning for a tsunami so the best you can do is prepare as best you can by doing the following:

- Prepare a family response plan and know where to evacuate to in the event of a tsunami warning, ideally move inland at least 2 km
- Prepare an emergency kit, including a battery operated radio, food and drinking water for at least 3 days, spare clothes, torch and spare batteries. Keep a list of emergency numbers handy
- Listen for official tsunami warnings through sirens, loudspeakers, radio, television, SMS and Internet that Tonga Meteorological Service (www.met.gov.to) may issue.

What should I do when a tsunami warning is issued?

One of the earlier signs of a tsunami is a strong prolonged earthquake. You may also see the ocean drop/recede or hear an unusual roaring sound from the ocean. If you receive an official tsunami warning, listen to your local radio, TV announcements and emergency service messages.

- If you are at the beach or near the ocean and you feel the earth shake, move immediately to higher ground. If you cannot move inland, seek shelter in the upper levels of a sturdy multi-storey building if possible. DO NOT wait for a tsunami warning to be announced.
- When a *Tsunami Marine Warning* is issued evacuate beaches, harbours and reefs.

- When an *Urgent Tsunami Warning* is issued move immediately away from the coast to higher ground inland.
- If possible walk to safety to avoid traffic jams and only take essential items that you can carry
- Check that your neighbours have received this advice and if possible, assist the disabled, young, elderly and other vulnerable groups
- If your boat is in deep ocean water, maintain your position until further advised. If your boat is moored or in shallow water, secure your vessel and move inland to higher ground.

After a tsunami warning and you have taken the appropriate action, continue to listen to your radio/TV for announcements after the tsunami is over and if possible, help others who may need it (injured, disabled, young, elderly and other vulnerable). The authorities will inform the public when it is safe to return to the affected area.

TROPICAL CYCLONE

A tropical cyclone is a low-pressure system which develops in the tropics with sustained gale force winds of at least 63km/hour. The cyclone season in Tonga is from November to April, however the peak time for tropical cyclones in Tonga is from January to March with most events occurring in February.

The Tonga Meteorological Service is also continuing to monitor El Niño conditions. Usually in an El Niño year Tonga can expect to receive 2 cyclones.

How can I prepare for a tropical cyclone?

Given the nature of cyclones, it is difficult to accurately predict how many and at what intensity will directly impact Tonga. It is always better to be over-prepared than under-prepared, and keep up to date with the latest weather forecasts. Here are some things you can do to prepare you and your family:

- Trim tree branches well clear of your home and clear your property of loose material that could cause injury or damage during extreme winds
- Secure your roof and fit window shutters (or at least metal bars or screens to keep airborne objects out
- Have an emergency kit on hand, including a battery operated radio, enough food and drinking water for at least three days, spare clothes, torch and spare batteries. Keep a list of emergency numbers handy.
- Listen to progress of a cyclone through information distributed through radio, TV, and SMS and internet messages provided by the Tonga Meteorological Service
- Depending on predicted wind speeds and storm surge heights, evacuation may be necessary. Be prepared early to evacuate immediately you are told to and know where you are going to go. This could be to family and friends or to an evacuation centre. Official advice may be provided on local radio/TV/SMS about safe routes and when to move.

How do I know what impact the cyclone will have?

When the Tonga Meteorological Service provides cyclone warnings, they will refer to what Category it is. That is, it's level of intensity. Each level is categorised according to sustained wind speed, wind gust speeds and potential impacts. There are 5 categories of cyclones:

Category 1 – Sustained gale force winds of 63 – 87 km/hr. Wind gusts of less than 125 km/hr (damaging winds). Negligible house damage. Damage to some crops and trees. Boats may drag anchor e. g. TC CILLA.

Category 2 – Sustained gale force winds of 88 – 117 km/hr. Wind gusts between 125-169 km/hr (destructive winds). Minor house damage. Significant damage to trees. Heavy damage to crops. Risk of power failure. Small boats my break anchor e.g. TC HINA.

Category 3 – Sustained gale force winds of 118 – 157 km/hr. Wind gusts between 170-224 km/hr (very destructive winds). Some roof and structural damage. Power failure likely e. g. TC KINA.

Category 4 – Sustained gale force winds of 159 – 200 km/hr. Wind gusts between 225-279 km/hr (very destructive winds). Significant roofing loss and structural damage, dangerous airborne debris e. g. TC WAKA.

Category 5 – Sustained gale force winds of over 200 km/hr. Wind gusts over 280 km/hr (very destructive winds). Extremely dangerous with widespread destruction e. g. TC IAN.

What do I do during the cyclone?

It is natural that you are anxious prior to and during a cyclone. Do not panic and do not underestimate the potential impact or the period of time the damaging winds will last. Also be aware that a cyclone has an eye in the middle of it which causes a period of calm before the cyclone completes its path through the impact area. During the cyclone you should:

- Disconnect appliances, stay indoors and in the strongest part of the building
- Stay clear of windows and doors
- Open the window away from the direction of the wind to relieve pressure on the roof
- If the building breaks up protect yourself with rugs and mattresses under a strong table or similar and hold on to something solid.

What about after the cyclone?

After the cyclone has passed, it will be tempting to see what damage has been done. Be aware of some of the hazards in moving around an impacted area and how to support and survive in the aftermath.

- Stay a minimum of 8 metres away from fallen power lines
- Boil all drinking water and make use of available crops and fallen fruit before they spoil
- Help others who may need it such as people who are injured, disabled, young and elderly and other vulnerable groups.

DROUGHT

Drought is often a slow complex emergency that can affect livestock and the livelihoods and health of those impacted. Major droughts usually occur in Tonga during El Niño years.

What is El Niño?

El Niño is an ocean and atmospheric phenomenon that has a significant impact on our weather. The effects of El Niño is mainly felt in the Pacific area, especially Australia, Indonesia and south-west America.

El Niño results in a hotter average temperature by about 0.1 to 0.2 degrees. During an El Niño event, trade winds from the east weaken or may even reverse, allowing the area of warmer than normal water to move into the central and eastern tropical Pacific Ocean. The associated change in winds lead to the release of heat from the ocean to the atmosphere. The movement of warm, moist air also causes drier than normal conditions in much of the Western Pacific, but wetter than normal conditions leading up the north-west coast of South America into Central America.

When the converse 'La Niña' conditions occur, we get wetter than normal conditions in much of the West Pacific, and drier than normal conditions in the north-west region of South America.

El Niño is a natural occurrence and happens about every 3 to 7 years. Typically, an El Niño develops around May/June, strengthens through September/October and November to peak over December/January, then starts to decay in late February with weather conditions returning to normal around March.

Current indications are that we are heading towards an El Niño later in 2014. Tongan temperature and rainfall patterns in the last 5 to 7 months have been El Niño like with drought affecting the entire country since June.

Traditional knowledge indicates that when drought conditions are more severe during the dry season (resulting in the fruiting of most fruit trees) such as that currently being experienced, enhanced tropical cyclone activity is to be expected in the upcoming cyclone season. It is estimated that Tonga may receive 2 cyclones in an El Niño year.

Being prepared for a drought means being able to manage water, so that it lasts for longer, even when there is no rain for a long time. Planning a year ahead can help reduce shortages of food and water by planting drought resistant crops and conserving water.

How do I conserve water?

- Make sure that water is used wisely in the home and around the garden
- Check for dripping taps, leaky pipes and reducing waste water.
- Install a rainwater tank and have shorter showers.

EBOLA

Ebola is an infectious and generally fatal disease marked by fever and severe internal bleeding, spread through contact with body fluids infected by the Ebola virus. The virus is transmitted to people from some wild animals and spreads in the human population through human-to-human transmission. The most severely affected countries are, Guinea, Sierra Leone and Liberia, however other countries in Central and West Africa are also affected.

The time interval from infection with the virus to onset of symptoms is 2 to 21 days. Humans are not infectious until they develop symptoms. First symptoms are the sudden onset of fever fatigue, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, symptoms of impaired kidney and liver function, and in some cases, both internal and external bleeding (e.g. oozing from the gums, blood in the stools).

Ebola then spreads through human-to-human transmission via direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people, and with surfaces and materials (e.g. bedding, clothing) contaminated with these fluids.

How can I avoid being exposed to bodily fluids of someone possibly with Ebola?

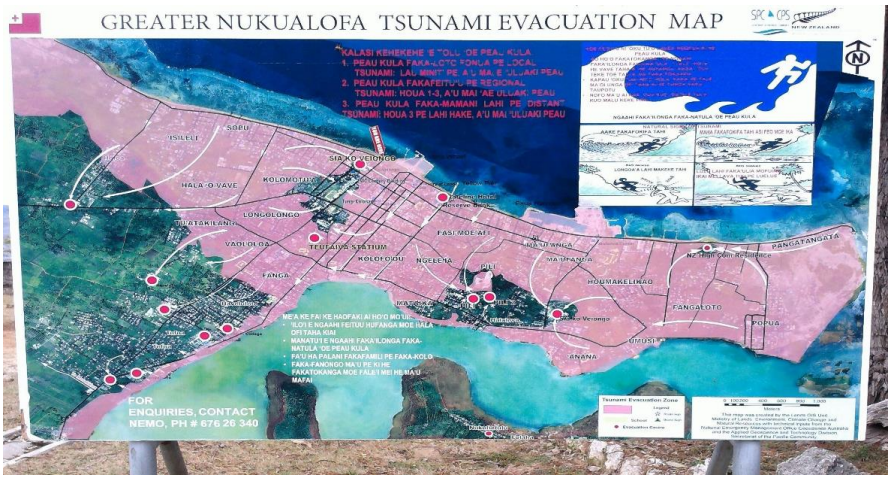
- Do not visit countries impacted by the Ebola virus, in particular Guinea, Sierra Leone and Liberia
- Never touch the dead body of anyone who died of Ebola
- Keep a distance of more than 15 meters from suspected Ebola cases
- Eliminate the habit of kissing dead bodies of deceased relatives.

As there is no vaccine or cure for Ebola, an extremely high risk exposure to it would be of very serious concern to Tonga. Being careful of where you travel when overseas and ensuring you do not have close contact with people who may have Ebola is of national importance.

For more information about Disaster Risk Management contact:

The National Emergency Management Office
Ministry of Environment, Energy, Climate Change, Disaster Management, Meteorology, Information and Communications
Vaololo
Nuku'alofa
Tel: (676) 26340
Fax: (676) 28220
Email: tonganemo@gmail.com
or

Tonga Meteorological & Coast Radio Services
Ministry of Environment, Energy, Climate Change, Disaster Management, Meteorology, Information and Communications
Domestic Terminal
Fua'amotu Airport
Nuku'alofa
TONGA
Phone: (676) 35355 (Forecaster) or 35008
Fax: (676) 35123
Email: metstaff@met.gov.to
Website: www.met.gov.to



Tsunami Evacuation Map sign, Vuna Rd, Nuku'alofa *Image credit: NEMO*

BE PREPARED

Check your Tsunami Evacuation Map local sign

KNOW YOUR PLAN
KNOW WHERE TO GO
KNOW WHAT TO DO