

MINISTRY OF METEOROLOGY, ENERGY,
INFORMATION, DISASTER MANAGEMENT,
ENVIRONMENT, CLIMATE CHANGE AND
COMMUNICATIONS (MEIDECC)

NUKU'ALOFA, TONGA



Volcanic Eruption/ Ash Preparedness and response plan

(Rapid onset hazard)

TOC

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Volcanic eruption/ ash

Preparedness and Response plan

Introduction

Tonga is currently listed as the second most vulnerable country to disasters, with Vanuatu also located in the South Pacific, as the most vulnerable, according to the World Risk Report (2020).

The development of this preparedness and response plan is based on a range of documents on volcanic eruptions and ash fall and how best to respond in this event based on what is available in Tonga.

This plan is to be reviewed on an annual basis and does not detail the preventative components or the long-term recovery as these will be covered in other plans and through regular NEMO business, in close consultation with other Departments and Ministries.

This plan has been prepared by the National Emergency Management Office (NEMO) and **approved** by the National Emergency Management Committee (NEMC), with technical guidance from the Department of Meteorology (Tonga MET) at MEIDECC and the Geological Services at the Ministry of Land, Survey and Natural Resources (MLNR) as the early warning system and technical advisors.

Purpose

This plan is prepared for NEMO and disaster related stakeholders to reduce risks by enhancing Tonga's preparedness and readiness to respond to volcanic eruptions and the related potential spread of volcanic ash that is likely to cause further negative impacts across communities.

This plan aims to achieve the following objectives:

- Prepare Tonga's communities by:
 - providing accurate, timely warnings and information to enable quick, informed decisions to keep potential affected people safe and protected from any negative impacts,
 - responding immediately and providing relief when safe and as safely and quickly as possible to reduce any further potential negative impacts to communities,
 - reducing risks and minimising community's vulnerability when exposed to volcanic eruptions and related after effects,

This plan will strive to achieve the following outcomes before, during and immediately after a disaster event:

- (a) no loss of life or serious injury;
- (b) minimal negative impact on Critical Infrastructure or Essential Services;
- (c) limit and contain any negative impact on the environment;
- (d) minimal negative impact on Government services through an effective business continuity program;
- (e) timely and effective response in light of the State of Emergency with COVID19;

- (f) effective communication and liaison between and within support agencies at all levels at all times;
- (g) accurate safeguarding of prepositioning of supplies for affected communities;
- (h) timely and accurate information is disseminated to the public enabling informed and proactive decision making for individual and family responses to events; and
- (i) restoration of disrupted services as rapidly as possible.

The following assumptions have been made in the development of this plan:

1. Many of Tonga's residents are familiar with the impacts and the region's susceptibility to volcanic eruptions,
2. Tongan residents will take on some responsibility to adequately prepare and take heed of the alerts and warnings and will make informed decisions to keep themselves safe (whether by remaining at home or by seeking shelter with family and friends or at evacuation centres).
3. Tonga Meteorological Services (Tonga MET) and the Geological Services of the Ministry of Lands, Survey and Natural Resources (MLNR) will provide timely warnings and alerts when possible, though not guaranteed as volcanic eruptions can be a rapid onset hazard;
4. The National Emergency Operations Centre (NEOC) and, if also required, District Emergency Operations Centres (DEOC) will be activated based on established triggers and protocols;
5. Tonga MET and the Geological Services of the Ministry of Lands, Survey and Natural Resources (MLNR) will continue to maintain accurate mapping and associated data that will be available to all stakeholders and the public;
6. The Cluster system will be activated, as recommended by NEMO, and have standard operating procedures and trained, equipped and available personnel to perform the roles and responsibilities of that specific Cluster.
7. NEMO through the NEOC will coordinate distribution of resources to ensure response capacity is sustainable over an extended period, and in the event of consecutive disaster events to volcanic eruption/s.
8. Should there be another crisis, the lead agency, if not NEMO, will provide a representative at NEMO and NEOC as an immediate technical advice expert to ensure the complexities with a dual crisis are considered and handled appropriately. For example, in the case of the pandemic, with COVID 19, the Ministry of Health will provide a representative. As in this case, *it is expected that the MLNR Geological Services and Tonga MET will provide a representative for technical guidance.*

NEMO aims to minimise risk and negative impact in the event of a disaster by ensuring the community is also responsible in making informed decisions so there is also a focus to protect and provide critical services continuously while being prepared to provide a quick response.

Background

Volcanic eruption and ash - hazard

A volcano is an opening in the Earth's crust that allows molten rock, gases, and debris to escape to the surface.

A volcanic eruption may release acid, gases, rocks, and ash into the air. Lava and debris can flow at up to 100 mph, destroying everything in their path.

Volcanic ash

- can travel 100s of miles and cause severe health problems,

- Can contaminate water supplies, damage machinery, and reduce visibility,
- exposure can cause serious harm as it can be hard to breathe for the elderly, infants and those with chronic respiratory diseases. There is increased exposure for those living in low-lying areas.
- exposure can also irritate the skin, eyes, nose, and throat and make it difficult to breathe.

Volcanic earthquakes generally occur at shallower depths than Tectonic Earthquakes.

There are several classifications of Volcanic Earthquakes.

- A-type volcanic earthquake – Takes place in and beneath volcanoes with foci between 1 – 10km deep.
- B-type volcanic earthquake – Originates usually in and adjacent to active craters at very shallow depths (foci at depths of 1km or less).
- Explosion earthquake – earthquakes taking place at the very surface of the Earth.
- Volcanic Tremor – These earthquakes are due to long duration, more or less, volcanic vibration. This is associated with flow or underground magma, oscillation in magma reservoirs or explosion of volcanic gases.

Tonga has a history of volcanic activity, recorded from 1839. There is an active volcano on the island of Niufo'ou. The last major eruption was in 1946, when the island was completely evacuated.

A violent volcanic eruption with extensive destruction caused the population of about 1,300 people to be evacuated to 'Eua.

Due to Tonga's location along the subduction zone, the islands are exposed to the risk of volcanic eruptions.

The subducting Pacific plate begins to melt as it is pushed closer to the hot core of the earth. This melting produces extra magma below the Australian tectonic plate. This magma then rises to the surface and produces a volcanic eruption.

The eruption type reportedly most common to Tonga is called a Volcanic Back Arc with Surtseyan eruption style, which typically occurs, in the ocean. This is because the extremely hot magma interacts with the cold ocean water making it cool extremely quickly producing lots of small ash sized fragments.

Volcanic activity typically has three stages:

- Active: where there is ongoing eruptions, steam or regular obvious activity occurring
- Dormant: where the volcano currently has no activity but has the potential to move back into an active phase
- Extinct: where the volcano no longer has a magma source beneath it. They typically haven't erupted for thousands of years and won't erupt again.

The strength of a volcanic eruption is typically measured by the Volcanic Explosivity Index (VEI), based on a scale of 1 (small) to 8 (large).

It is reported that the recent 2009 eruption between Hunga Tonga and Hunga Ha'apai was a VEI 2.

In addition, the previously mentioned undersea eruption that occurred to the west of the islands of Hunga Tonga and Hunga Ha'apai in Tonga in 2009.

High risk areas of volcanic eruption and ash

Tonga's geographical location within the Pacific Ring of Fire, and within the subduction zone of the Australian and Pacific tectonic plates render it highly vulnerable to volcanic, seismic and tsunami hazards.

Tonga is also situated approximately 200km west of the Tonga Trench, which is considered a high potential source for seismic activity. Historical data shows that there has and continues to be high seismic activity in Tonga.

This area contains a particularly active chain of marine volcanoes that runs north-south. However, despite there being no recent highly destructive eruptions, this remains an ever-present hazard.

Fortunately, the risk of serious impacts directly to infrastructure and life is low due to the low exposure of people within reach of destructive volcanic impacts in Tonga.

However, the risk of disruption due to ash fall is relatively high.

The high risk is related to the impact on supplies and tourism due to the disruption of flights in and out of the country, impacting tourism and supplies being imported into the country by air

Tonga has 18 reported volcanoes throughout its wider region. 11 of Tonga's 18 active volcanoes are under water and are reported to pose little threat to human life and infrastructure. Nevertheless it is necessary for Tonga to be prepared and have an appropriate response plan in the event of a significant volcanic eruption with ash flow.

FURTHER INPUT REQUIRED FROM GEOLOGICAL SERVICES

Other areas across the Kingdom of Tonga to be considered are:

Eua

Tongatapu

Ha'apai

Tofua volcano is based in the Ha'apai Island group, which poses a high risk to Ha'apai communities particularly those in XXXX

In 2009 an undersea eruption occurred in the central island group 'Hunga Tonga - HungaHa'apai' region. The eruption was visible from the capital Nuku'alofa with emissions of steam and ash reaching more than 1km in height. The steam and ash column first appeared following a series of sharp earthquakes that were experienced in Nuku'alofa, resulting in the cancellation of both domestic and international flights, and causing detrimental impacts on the surrounding marine ecosystem.

Vava'u

Niufo'ou

Niafo'ou island is a high risk zone as the X communities could be more exposed to the volcanic ash following volcanic eruptions

As recently as February 2021, the Geological Services advised that frequent earthquakes observed at Niufo'ou can be considered Volcanic Tremor.

Niuatoputapu

Potential risks to Tonga

The following are at risk in the event of a disaster:

- people (and communities)– possible injury and fatalities
- infrastructure and property – infrastructure including private buildings damaged and destroyed
- environment – damage to the environment, impacting agriculture and aquaculture
- economy and livelihoods – effect on the economy as a result of negative impacts from volcanic eruption disrupting travel and transportation of people, agriculture (imports and exports) (for example, planes and ships can be severely damaged from ash fall)

Vulnerable populations

Tonga's vulnerable population is more likely to be exposed and susceptible to the risks of the immediate impact of a volcanic eruption due to the ash. It is even more imperative than usual to ensure their needs are considered in NEMO's preparedness, relief and response plans and that the safety and protection of women and children, persons with disabilities and elderly and the sick are always included. Also important to note that people with respiratory issues may be at higher risk. (impact of plumes?)

Currently through the established Cluster system, the Safety and Protection cluster focus is on populations that are deemed to be at a higher risk to the negative impacts such as the elderly, persons with disabilities and women and children. As per key messaging, everyone in the community is encouraged to be prepared in the first instance, including vulnerable persons and communities by preparing food, water and shelter items that will enable affected persons to have food, water, clothing and temporary shelter for 72 hours while awaiting immediate relief efforts to reach them.

NEMO also works closely with the Safety and Protection Cluster to ensure that persons with disabilities and other groups are included in the planning process for their own preparedness and NEMO's relief and response efforts.

Once the Director activates the National Emergency Operations Centre (NEOC), Cluster Leads who are also members of NEMC are advised by the NEMC Chair. These members will need to notify and action their response plans as soon as possible which includes alerting the Cluster focal point. It is imperative the Cluster Lead & Cluster focal point of Safety and Protection immediately notify their key stakeholders and provide as much information as possible on the

volcanic eruption based on the update provided by Tonga MET and/or MLNR Geological Services for their safety, as per Clusters SOPs.

NEMO may also engage directly with the vulnerable populations and their advocates as required, where possible to further reduce risks.

Key agencies for volcanic eruptions

The key agency in Tonga for volcanic eruption and ash is the:

1. Ministry of Land, Surveys and Natural Resources, with the Geological Services providing the technical information,
2. with support from Tonga Meteorological Services, particularly with regards to aviation.

NEMO through the National Emergency Operations Centre (NEOC), once activated, will provide the usual support in a disaster to communities. While MLNRs Geological Services and Tonga MET provide the warning information, NEMO will continue to coordinate the immediate relief and response to affected communities, with the first responders' team and through the Cluster system.

The Geological Services monitors the seismic and volcano activity through a number of websites that provide information on this activity as well as volcanic cloud monitoring which detects ash in the air. Tonga Met also plays a key role and works closely with in the early warning and monitoring of the hazard. Both these agencies as well as the response support agencies to NEMO have their own standard operating procedures, all relevant alerts, warnings and information is immediately shared with NEMO – to the Director and staff for the EOC.

The key support agencies assisting NEMO with risk reduction based on their technical expertise and responding to and recovering from volcanic eruptions are as follows:

Organisation/ Department		Responsibilities
1.	His Majesty's Armed Forces (HMAF)	First responder, safety, evacuation support, COVID19 support team
2.	Tonga Fire and Emergency Services (TFES)	First responder, security, safety, evacuation guidance, COVID19 support team
3.	Tonga Police	First responder, security, safety, evacuation lead, COVID19 support team
4.	Tonga Geological Services Ministry of Land, Surveys, and Natural resources	Provide technical advice including volcanic and seismic activity and ongoing monitoring
5.	Tonga MET	Provide weather advice on conditions and warnings including sulphuric acid levels and ongoing monitoring
6.	Department of Communication MEIDECC	Direct communication with media, Communication with public (quell misinformation/ info-demic) via media

7.	Ministry of Health	Advice on current COVID19 status and protocols and other health matters. Also advise on post volcanic eruption and ash health concerns (e.g. respiratory infections, water contamination etc.)
8.	Ministry of Infrastructure Department of Transport	Critical infrastructure maintenance, general public infrastructure maintenance, general community infrastructure Provision of transport, COVID19 support team
9.	Ministry for Internal Affairs	Focus on disability, women and youth, elderly populations, engage closely with NGOs
10.	Ministry of Public Enterprise	Critical services cluster lead agency – with Tonga Power, Tonga Water Board, Tonga Communications Corporations and Digicel within cluster, essential services providers
11.	Tonga Red Cross	community engagement, relief items, psychosocial support – with MORDI & Caritas

There are 10 clusters currently operational in Tonga, listed in the table below. Senior Ministry staff are members of the National Emergency Operations Committee and are alerted at the same time the NEMC is placed on standby. NEMC members (who are Cluster Leads) should also advise their Cluster focal point immediately when they are advised that the NEOC is activated, based on Cluster activation procedures.

Cluster	Lead Agency	Supporting agency	Co-lead Agency/ Body
Logistics & coordination	NEMO, MEIDECC	First Responders	World Food Programme (WFP)
Health & Nutrition, Water and Sanitation and Hygiene (HN WASH)	Ministry of Health		World Health Organisation (WHO)
Education	Ministry of Education		UNICEF
Shelter (Reconstruction)	Ministry of Infrastructure		International Federation of Red Cross (IFRC)
Food Security & Livelihood	Ministry of Agriculture, Food and Forestry	Ministry of Fisheries	WFP

Safety & Protection	Ministry of Internal Affairs	National Disability Council, Women's Crisis Centres, Youth Councils	UNICEF, UNWOMEN
Emergency Shelter & Non-Food-Items	NEMO, MEIDECC	Tonga Red Cross	IFRC
Emergency Telecommunications	Communications Department, MEIDECC		WFP
Critical Services	Ministry of Public Enterprise	TCC and Digicel	World Bank (WB) and Asian Development Bank (ADB)
Economic & Social recovery	Ministry of Finance		UN, WB and ADB

Preparedness

Unlike cyclones and drought, which are slow onset events in relatively predictable times of the year, volcanic eruption with associated ash fall can occur at any time with little to no warning. This emphasises the urgent need for ongoing preparedness by NEMO with advice from technical agencies to always be at a level of readiness to provide an appropriate response to communities.

For a volcanic eruption, NEMO has highlighted the following critical services based needs for consideration with preparedness and readiness.

Critical services

- Fuel management
- Transport restrictions
- Food supply management
- Water supply management

Preparedness also relates to prepositioned stock and well maintained machinery and equipment that is available at NEMO warehouses with the bulk of the equipment and stock in Tongatapu.

For any of the equipment to be used, NEMO will need to be advised on the risk level as in the event of a volcanic ash fall, this could also cause damage to the equipment. This information on risk needs to come from Geological Services.

Activation of the National Emergency Operations Centre (NEOC)

As per usual activation practices for NEOC, for volcanic eruptions and ash fall, Tonga Met and/ or the Geological Services MLNR will need to immediately contact the Director, NEMO who in liaison with the Chair of the NEMC, will place the NEOC on standby or activate. This decision is based on the technical advice provided which will include the type of hazard, the risk to the Tongan community, which Tongan communities are at higher risk (and why), if possible, and all

relevant information for NEMO to make a calm, informed decision, to make that immediate assessment.

Depending on the area, NEMO will determine which Island/ District Emergency Management Committees will also be activated (or placed on alert/ stand by) as there may be a situation where Tongatapu is not affected, however one of the northern Island groups is heavily affected.

For NEOC to commence operations, in the event of a volcanic eruption, ash fall, plumes they need to be in the following activation level:

Level	NEMO action for NEOC	Alert/ Warning from Geological Services & Tonga Met	Aviation Colour Code (Tonga MET)
Readiness	<ul style="list-style-type: none"> Business as usual 	<p>Normal – Business as usual No alerts from Geological Services or Tonga MET - Info: Volcano dormant (or has returned to non-eruptive state after X weeks)</p>	Green
Standby	<ul style="list-style-type: none"> The Director of NEMO will declare this stage in force and alert relevant parties to prepare for next stages. 	<p>Advisory from Geological Services/ Tonga Met Advice: Increase in volcanic activity, increased slightly from the normal level.</p>	Yellow (return to yellow)
	<ul style="list-style-type: none"> The Director of NEMO will declare this stage in force and alert relevant parties to prepare for next stages. 	<p>Watch – Geological Services/ Tonga MET Advice: Volcanic activity heightened with potential eruption though timeframe unknown</p>	Orange
Activation	<ul style="list-style-type: none"> NEMO Director and NEMC Chair will formally advise that NEOC (and relevant DEOCs) should be activated 	<p>Warning - Geological Services/ Tonga Met Advice: that the impact of the volcanic eruption includes lava and volcanic ash and is about to directly impacting communities.</p>	Red (and return to Orange)
Stand down	<ul style="list-style-type: none"> NEMO Director recommend to NEMC Chair (with support from NEMC) advise of stand down activation level 	<p>Advisory/ Normal - Geological Services/ Tonga Met advises that there is no further threat from the volcanic eruption, ash, plumes as there has been no activity for <identified> timeframe</p>	Return to green

Early warning systems

Geological Services and Tonga Met provide information about potential risk and impending (where possible) or impact of volcanic eruption and/ or ash fall to NEMO, from their monitoring systems.

At any point that there is an increased risk of immediate / impending impact both agencies need to notify NEMO Director immediately via telephone.

Information collected from other early warning systems such as traditional knowledge and general observation should also be included and considered, where possible, in the advice provided to NEMO (and the public).

Volcanic eruptions may also occur without any warning, as has previously occurred in Tonga with direct physical observation of clouds and ash sprouting from the volcano.

In the event of minor tremors/ earthquakes, as advised by Geological Services with officers in potential affected areas, close monitoring is required and regular updates needed (it will be at the discretion of Geological Services and Tonga Met to determine and mutually agree, based on the potential risk to Tonga's communities, the frequency of updates) to also support NEMO in preparing response efforts.

Communication – public messaging

It is imperative that all messaging is consistent to avoid confusion and to enable the Tonga's communities to make the best informed decision for their (family and community's) safety.

It is NEMO's role to reduce risks with communities by:

- develop key messages to educate, inform and advise the Tongan public on the risks of volcanic eruptions based on technical guidance from Geological Services (and Tonga MET) and with Cluster support and advice (esp Safety & Protection)
- develop and conduct awareness campaigns through radio program/ interview or television, interviews, social media or other relevant platforms (including NEMO website) that will reach everyone in the community, to educate and empower Tongan communities on what to do before, during and after a volcanic eruption,
- work with the community to increase safety and resilience in the event of a volcanic eruption,
- work with the community to provide advice on how best to seek shelter,
- regularly communicate and update the community in the event of a volcanic eruption,
- coordinate immediate relief and response options to, for and with the community
- ensure the needs of the most affected especially the most vulnerable communities are addressed appropriately.

NEMO with Geological Services and Tonga MET input will develop messages around the warning stages that will be provided to Tongan communities to be better prepared and empowered to be able to react immediately for safety purposes.

During the event, due to the immediacy of the impact, Tongan communities will be encouraged to refer to reliable sources such as the Government of Tonga websites, NEMO's website, dashboard and social media platforms, and the radio will be the main sources of information.

Immediately after the event, NEMO while continuing to focus on saving lives, with first responders/ Logistics and Coordination Cluster, will also provide key messages to ensure

communities are encouraged to remain where they are until safe enough to move around and assess damage and progress with clean up. Town and District officers (and Village Emergency Management Committees) will assist with communication and advise of assessments that will occur within the first 48 hours when safe to do so. NEMO will reiterate that the assessments will focus on damage as a result of this hazard's impact, which will then be followed by a comprehensive detailed damage and loss assessment.

All damage and loss data collected through these assessments belong to NEMO and will be shared/ exchanged with stakeholders, as required.

>messaging/ warnings/ alert< *Information required from Tonga MET or Geological Services.*
NOTE – NEMO will liaise with Clusters also for information relevant to their cluster with regards to actions required by each Cluster in minimising risk, vulnerability and exposure.

This messaging with regards to ash fall / zones (safe and unsafe) / impact on water/ food/ infrastructure and on people.

Alert level & Aviation colour code	Key messages/ warnings for each phase
<p>Normal –Business as usual No alerts from Geo Services/ Tmet Info: Volcano dormant (or has returned to non-eruptive state after X weeks) Green</p>	<p>Ongoing community awareness on what to do before, during and after (see annex as example)</p>
<p>Advisory from Geo Services/ Tmet Advice: Increase in volcanic activity, increased slightly from the normal level. Yellow</p>	<p>~ What actions to take to minimise risk – eg – review evacuation route – if may be impacted (for island/ coastal communities close to volcano)</p> <p>Return to Yellow (following eruption)</p> <ul style="list-style-type: none"> - do not enter hazardous zones - do not fish in area
<p>Watch – Geo Services/ Tmet Advice: Volcanic activity heightened with potential eruption though timeframe unknown. Orange</p>	<p>~ What actions to take to keep safe – (as per HHTH – detach water connection / ash fall</p> <ul style="list-style-type: none"> - travel warnings
<p>Warning – Geo Services/ Tmet Advice: that the impact of the volcanic eruption includes lava and volcanic ash and is about to directly impacting communities. Red</p>	<p>Actions required:</p> <ul style="list-style-type: none"> - evacuate? - Stay indoors -

Shelter (remain in place or evacuate)

NEMO will provide information on where Evacuation Centres are located for each Island group on the NEMO website, so it is accessible all the time. These will be shared in the event of a hazard (as it is during a Tropical Cyclone).

This information will be reposted on the NEMO Tonga social media pages and via text message through the Communications Cluster to ensure that the information is easily accessible before and during volcanic eruptions. This information will also be broadcasted over the radio, repeatedly.

NEMO will encourage, based on technical advice, communities, especially vulnerable populations to either seek shelter in place, if deemed safe or to evacuate as soon as possible.

A mandatory evacuation is to be decided by the National Emergency Management Committee in direct consultation with the Director, NEMO and upon advice from Tonga MET and MLNR Geological Services, with directions of safest areas/ evacuation centres to go to.

MLNR Geological Services has provided safe zone areas on Niuafu'ou. (Annex 2). (Note – this was from March/ April volcanic activity report)

MLNR Geological Services will provide safe zones on the other islands. (Annex 3)

Evacuation routes are *(to be included)* at Annex 4.

NEMO working closely with the Safety & Protection cluster will need to ensure that all vulnerable communities, especially those who may be in the impact zone have received the evacuation messages and are supported by their family, community, village when seeking shelter.

Response

NEMO will coordinate the response with the first responders, based on the safety advice of Geological Services, MLNR (and Ministry of Health), as per usual practice.

At all times the safety and welfare of the first responders needs to be considered before deploying to provide relief to impacted communities. NEMO, as part of their messaging with the community, will advise that, the initial assessments will focus on damage and on the directly affected communities.

Similar to other hazards, a series of assessments will be undertaken. Prior to commencing these, GHU MLNR with Tonga Met and Ministry of Health will review the data, for example, aftershocks of a volcanic eruption, ash fall, review the level of sulphuric oxide in the air and the direction and speed of the wind and duration and determine the area it will affect and the deemed safety.

Only following the advice from health and these agencies will first responders (search and rescue team/ logistics and coordination) be deployed and assessment teams be ready to conduct immediate assessments for completion within 48 hours that has been deemed safe to do so. The first responders and NEMO will be in regular contact with the Town and District Officers.

This initial damage assessment will be conducted in a manner that will assess the immediate damages and verify information provided during the event. This will be included in the regular 4 page report (IDA report) for the National Emergency Management Committee to determine relief efforts, the next stage of a response.

Recovery

The National Emergency Operations Committee, will hand over to the National Disaster Recovery Committee who will commence the development of the recovery plan for the volcanic eruption. The recovery plan will be developed based on the recommendations from the detailed disaster assessment which considers and provides information (including an analysis) on needs based on damage with an enhanced focus on Safety and Protection cluster as it provides details on vulnerable population needs and is also considered by other clusters.

As per usual practice, the recovery plan for this will be funded through the National Emergency Fund with eventual plans to transition into usual development while focussing on building back better through a risk informed lens to further minimise community vulnerability. .

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Annex

FACT SHEET: Communication – public awareness messages

Before

- Learn about the warning systems in place in the event of a volcanic eruption.
- Learn where the difference evacuation routes take you to
- Learn where the assembly/ evacuation centres are located
- Prepare a plan for you and your family, as the volcano may erupt when you are not in the same place (for example, you may at work and your children at school).
- Have a battery operated radio ready (with spare batteries)so you can tune into the local station
- Prepare 72 hour bag/ evacuation bag in advance
- Ensure you know what station/s to tune into
- If there is an eruption predicted, follow the advice provided by the authorities

During - Pending the impact, some of these will be shared with the public

- Listen to your local radio station on a battery operated radio or television for the latest updates
- Follow evacuation orders and if advised to evacuate, do so early
- Stay indoors, even at evacuation centres, and if possible seal doors and windows (where ventilation comes in), using damp towels, where possible avoid opening windows
- Wear a dust mask to protect you from the particles,
- Wear goggles or eye glasses so your eyes are protected, this is probably better than contact lens in this situation
- Keep your skin fully covered to protect yourself from the ash
- Keep children and elderly indoors and where possible, avoid opening windows
- Disengage water pipes in the potential event of rain following a volcanic eruption
- When possible do not drive or travel during ashfall
- If you are outdoors, seek shelter indoors immediately

After

- Listen to your radio station and follow instructions provided by Tonga MET or Ministry for Lands, Survey and Natural Resources
- Contact family /friends to advise that you are safe
- If you have trouble breathing, please remain indoors and wear masks
- Do not approach the eruption area if you are in the vicinity
- Use another source of drinking water if there is ash suspected to be in the water, as it may be contaminated.
- Check for household and property damage

Annex 2 – hazard map of Niuafo’ou (from Mar 2021)

Annex 3 – hazard map of Vava’u, Ha’apai, Tongatapu and ‘Eua – if available

Annex 4 – evacuation route

Evacuation routes are (to be included) at Annex 4.

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