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

NUKU'ALOFA, TONGA

NEMO Initial Damage Assessment Guidelines

Aerial View of Patangata Village after TC Harold April 2020

Version 3 6 April 2021

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Foreword

I am proud and pleased to support this all of government approach for conducting an initial damage assessment in Tonga. In any disaster affected communities are the true first responders – supporting each other, checking on neighbours and sometimes looking after the injured until the machinery of government and agency arrive to support them in their hour of need. In the same way that communities know almost instinctively how to do that for each other it is incumbent on us that our response is equally instinctive and focussed. A coordinated Initial Damage Assessment will allow decision makers to make early decisions, it will help us communicate to partners and NGO's our response priorities and will set us on the path to recovery.

This is also a critical time for Tonga with the introduction of the proposed DRM Bill 2021 and on-going risks relating to COVID – 19 as well as our ever present exposure to re-current damaging cyclones which present the single biggest threats to Tonga as well as tsunami and earthquakes.

I want to acknowledge the New Zealand Government Ministry of Foreign Affairs for their support through the IDA process as well as our own cluster leaders and coordinators in government who have led important work that is already underway.

I want to encourage us all to continually improve our damage assessment capability in partnership with clusters, NGO's, business and the community.

Mafua-'i-Vai'utukakau Maka

Director of NEMO

Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications. (MEIDECC)

Introduction

Over the last three months NEMO staff, cluster coordinators and NGO's have contributed to the development of initial damage assessment guidelines to enhance our response to future disaster events.

Tonga is one of the most disaster-prone regions in the world in terms of the recurrence, severity and scope of natural hazards, with high exposure to cyclones, earthquakes, tsunamis, floods, tidal surges, and drought. The current global pandemic adds another layer of risk, compounded even further by the negative impacts of climate change.

Together we decided that long term it is our goal to improve our Initial Damage Assessment capability across Tonga so that NEMO, Clusters, NGO's and first responders can respond together to a request to deploy a nationally lead IDA team. We will achieve this by focussing on our people, building robust processes and using technology.

Preparing for and responding to natural disaster events is something that many of us have experienced. However, despite our familiarity with the likelihood and consequences of natural events, it is important that we collectively understand the importance of robust, well-managed and timely damage assessments. Accurate timely assessments allow early decisions to be made, with confidence, to assist those most impacted and to ensure that our transition from response to recovery is both timely and well thought through.

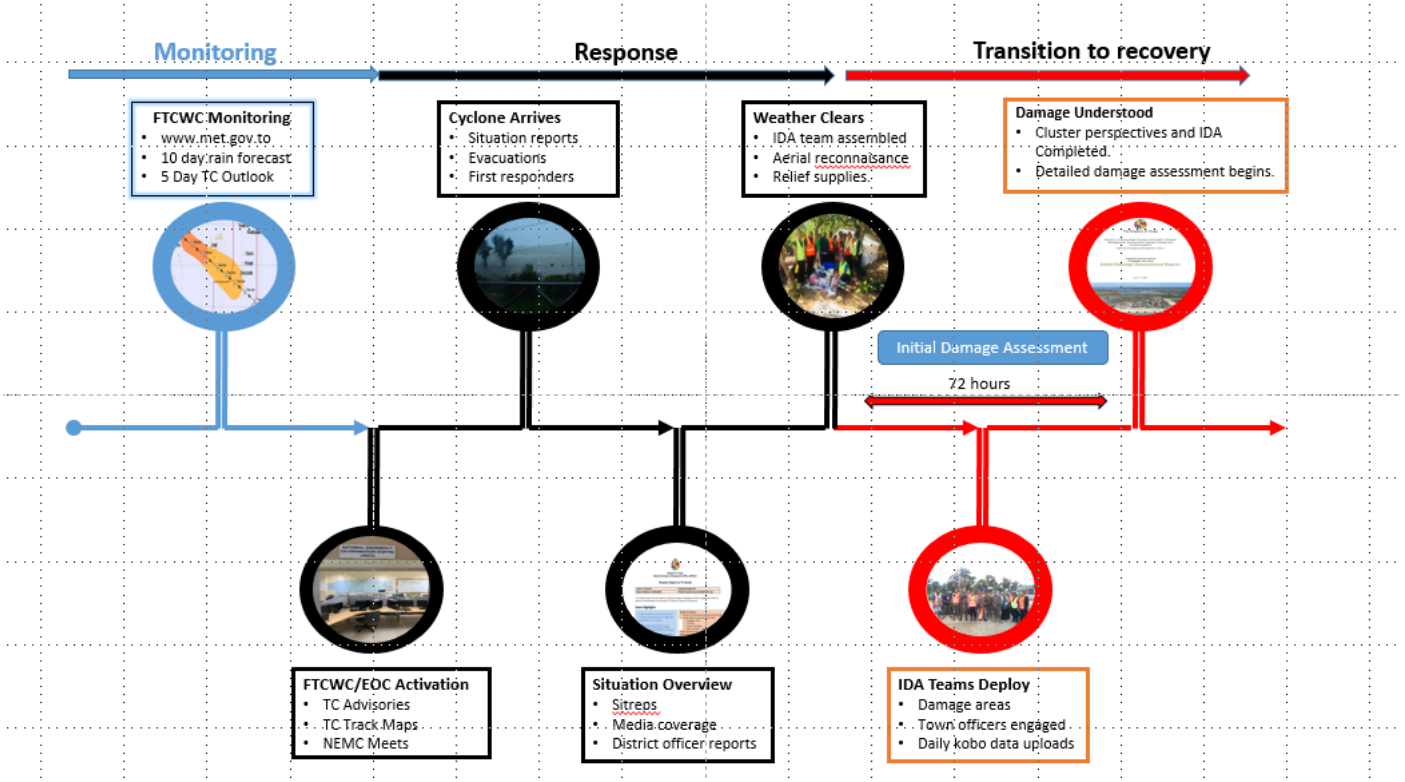
There are a number of initiatives and actions already underway. For example the Ministry of Agriculture, Food and Fisheries which sits inside the Food Security and Livelihoods Cluster is working at pace to capture data using drones and GIS technology in order to develop baseline data sets. Similarly the essential services cluster is working closely with utility providers like Tonga Power so that when a disaster occurs good working relationships help with the flow of information.

We know that we will encounter future challenges. This is not simply about preparing our built environment and communities, and it's not about bouncing back to the way things used to be. These guidelines are about understanding the risks and challenges we face as leaders. We must learn to respond better including how we understand our pre-disaster environments, how to collect data both during and after the event, how we deploy our teams into affected areas and develop ways to turn data into insights so that those who are responsible for making decisions can do so with confidence.

Initial Damage Assessment Process in Tonga

Damage Assessment Timeline

The IDA process is a rapid assessment that needs to be done quickly – in the case of a cyclone ideally within 72 hours from when the weather clears. It is the responsibility of the national controller and is lead by staff in the Emergency Coordination Centre supported by staff from other departments and ministries. The diagram below shows where the process sits within a disaster event timeline.



The Disaster Risk Management Bill 2021

Section 23(3) of the proposed National Disaster Risk Management Bill requires the National Disaster Risk Management Office (the Office) to establish national assessment teams to conduct initial damage assessments post disaster:

Functions of the National Disaster Risk Management Office

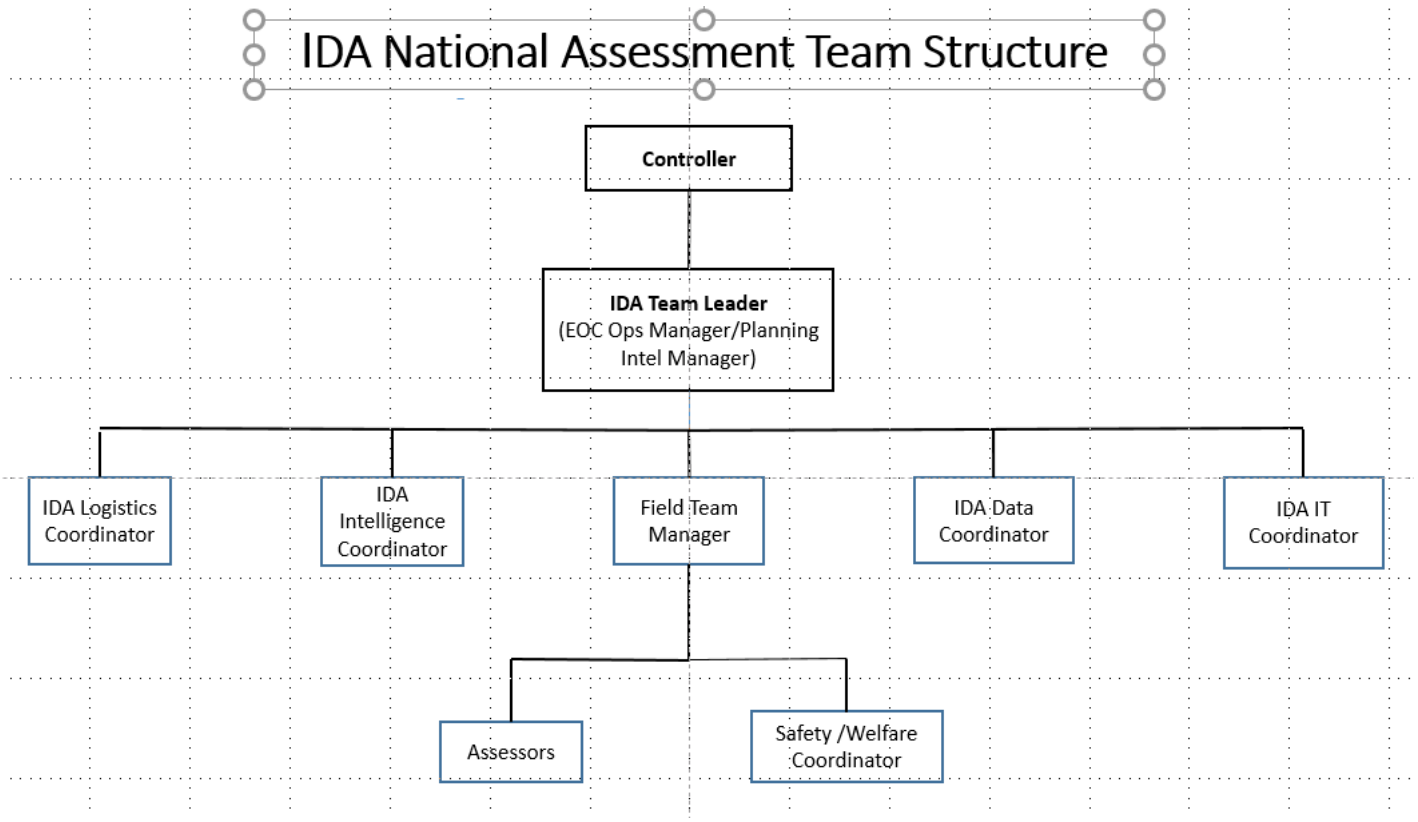
(3) At the time of disaster, the Office shall -

(a) establish one or more national assessment teams to conduct initial damage assessments following a disaster or an event, the report of which shall contribute to the formal report of the Government on the disaster or event;

It is unlikely that there will be any significant changes to this provision of the Bill as it makes its way through the consultation and legislative process to ultimately become law.

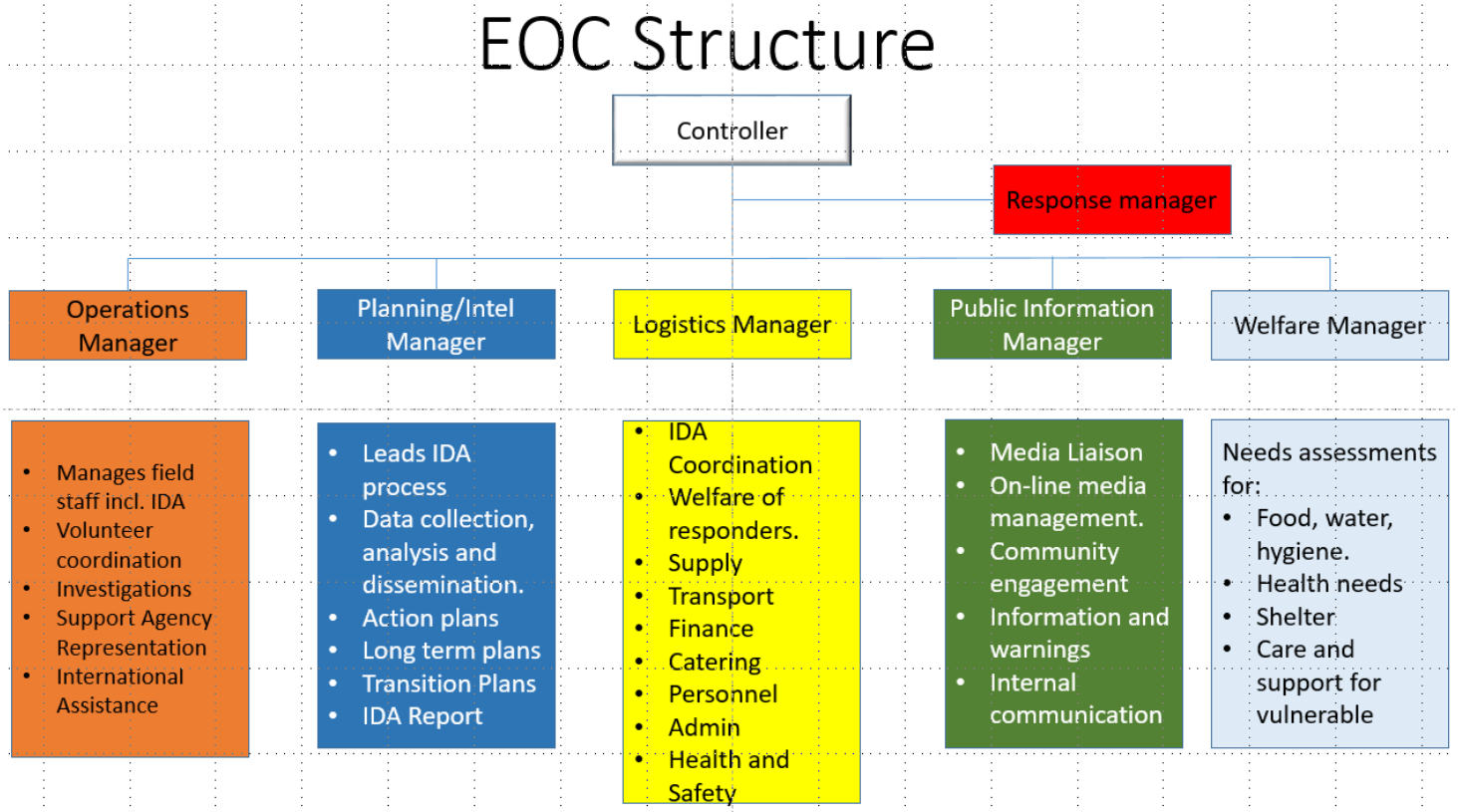
IDA Team Structure

In order to meet the intent of the Bill the following structure could be used for a national IDA team acting under the direction of the national controller in the emergency coordination centre. The following diagram shows a possible national assessment team structure.



In terms of aligning the IDA team structure to the functional areas of a typical EOC there are a number of options. Some roles can fall to EOC functional managers and their teams. For example, the EOC Operations Manager and the EOC Planning and Intelligence Manager could equally fulfil the role of IDA team leader. Similarly report writing and data analysis are core competencies of the planning and intelligence function which means delivery of the final assessment report can sit with that function. The roles of IT and data coordinator can also sit within the planning and intelligence team and can be seconded in on an as needed basis if they are not immediately available.

The following diagram is an example of where the IDA could sit within a typical EOC structure.



This is a typical coordinated incident management structure for an emergency operations centre. The controller is supported by an incident management team within the EOC. In this example the incident management team comprises the following functional managers:

- Operations manager
- Planning and intelligence manager.
- Logistics manager
- Public information manager
- Welfare manager

The diagram shows the typical functions of each area. In this example IDA leadership is sitting within the planning and intelligence function and is supported by the operations and logistics functions.

The purpose and responsibilities of each role are included in the following table. The controller will need to ensure that each person within the IDA team knows the purpose of their role and what they are responsible for delivering.

Role	Purpose	Responsibilities
Controller	To define IDA scope and area of operations.	Appoint IDA team leader Approve deployment plan Approve IDA report
IDA Team Leader	To provide leadership to IDA national team . To ensure the IDA deliverables are met and achieved.	Identify and assemble IDA team Develop IDA Deployment Plan Develop final IDA report
Logistics Coordinator	To procure and supply all resources for IDA teams across all deployment phases.	Ensure right people, right time and right place. Source and procurement of accommodation, transport, food, water, PPE, salaries/expenses, rostering of IDA staff, provide specialist equipment, work closely with IT Coordinator to procure IT needs.
Intelligence Coordinator	To provide intelligence to support IDA deployment.	Provide situational awareness across weather, all hazards, known damage, sea state, local context (analysis of political, environmental, social and technological.)
Communications Coordinator	To liaise between NEMO, local government, the public, and the media to ensure that affected communities receive accurate information about the IDA process	Prepare a media plan Develop key messages for IDA Liaise with and develop relationships with media. First point of contact and coordinator of responses to all media and public enquires.
Data and Analytics Coordinator	To design end to end process for data capture (Kobo), analysis and reporting.	Identification of - data capture methodology, IT resource needs, composition of assessment teams, receive and analyse data. Produce final IDA report
IT Coordinator	To provide IT support including hardware, software and connectivity to IDA teams across all phases	Prepare an IT plan to support the deployment Provide technical support for the design of survey forms using Kobo or similar platforms. Support both field teams and data analysis teams with connectivity, troube shooting and all IT related issues.
Safety and Welfare Coordinator	To provide for the health and safety of deployed teams and to liaise between NEMO and affected communities on welfare related issues.	Prepare health and safety plan including briefing and debriefing pre and post deployment. Provide welfare advice to IDA teams relating to impacts on communities including psycho-social impacts, interview techniques and to act as first point of contact for urgent referrals during the field phase.
Field Team Manager	To lead and coordinate all field operations	To identify and assemble assessment teams and assessors. Co-ordination of all aspects of field work including pre-deployment, deployment and close-out. Ensure status reports, quality assurance and debriefing of teams.
Assessors	To conduct field surveys in impacted areas	Collect data using a variety of mediums – face to face interviews, digital and field operations. Prepare updates and status reports as required.

Pre-deployment, Deployment and Data Capture Process

Depending on how much training and preparation is done pre-event the pre-deployment process will take no more than 24 hours. A successful damage assessment relies on three critical elements:

- **Roles and responsibilities** and how they fit into the overall process need to understood by everybody. No two disaster events are the same, however having a generic process that brings together the "who" and the "what" provides a starting point that can be adapted to suit. Attached at appendix one is a work flow diagram (also known as a "swimming lane" diagram).

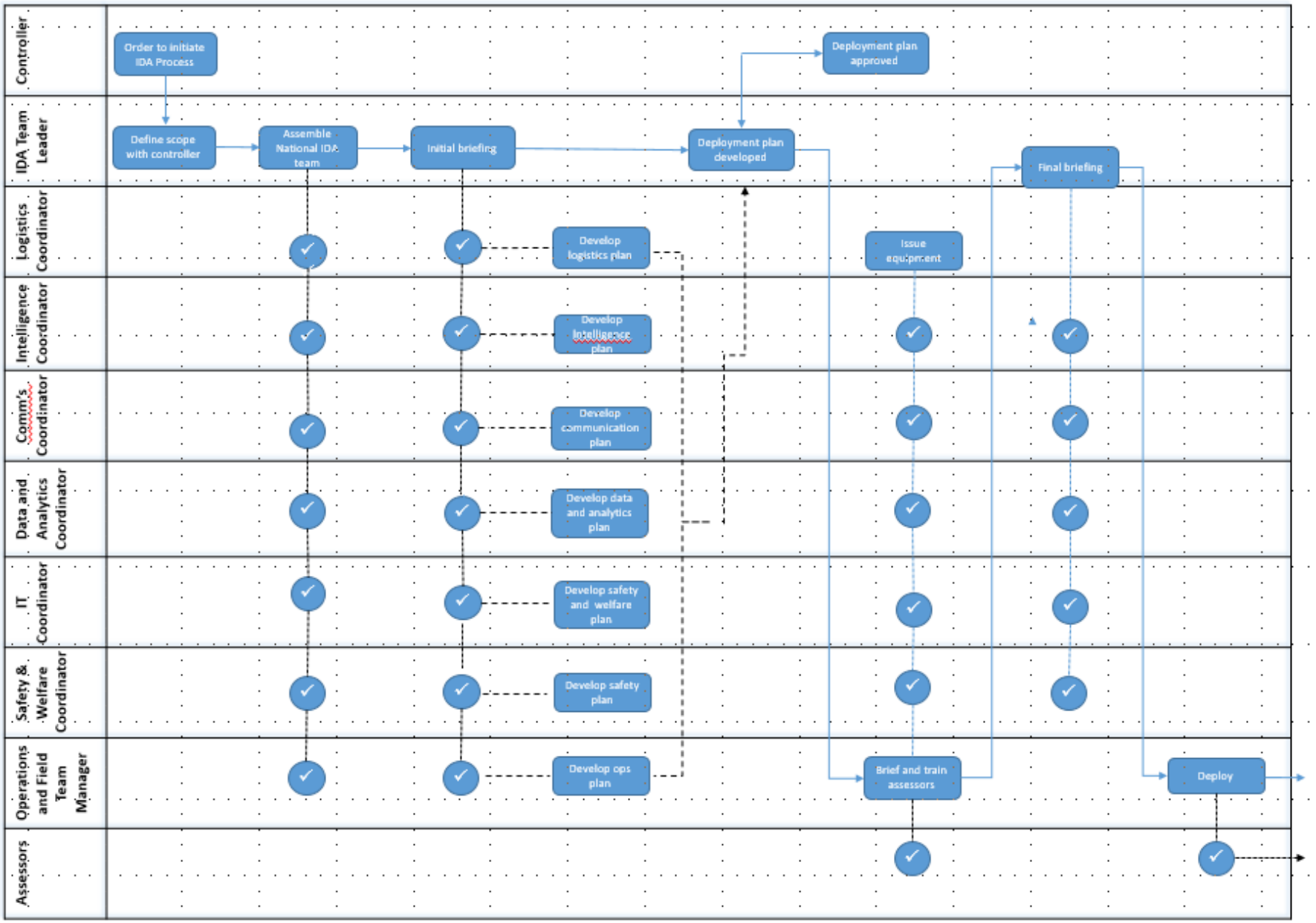
- **The Scope** of the IDA needs to be clear and well communicated to the entire team. The controller will consult with the NEMC and IDA team leader to determine the scope of the IDA. It will define the area of operations, time-frame for completion, the type of data and information required and who will be the key participants in the IDA process. The scope will also acknowledge that other Ministries, partners and NGO's will be active at the same time and will also signal to them what their contribution to the assessment and report will be. A draft scope is attached at appendix two.

- **The IT Environment** needs to be well established prior to an event in order to enable real time data capture and eliminate post- processing data after it has been captured in the field. An immediate priority for NEMO at this point (e.g pre-activation) involves setting up the IT infrastructure (server, device configuration, connectivity and connection protocols), acquiring and maintaining devices, setting up the IDA form in Kobo Tool Box, and training for NEMO staff and field assessors. The IT process for the pre-activation and activation phases including IDA Data Capture as well as roles, responsibilities and key tasks is attached at appendix three.

The IDA Report Template

In many respects the IDA report is similar to a situation report with standard headings. The difference is that sitreps are usually compiled from multiple status reports from functions within the ECC as well as from Incident Control Points and remote Emergency Operations Centres. Where an IDA differs is its intense focus on acquiring field data from affected areas in a short timeframe and then applying some analysis to achieve insight into what has happened across the Kingdom. The following template and guidance notes are designed to streamline the process and provide a starting point for the writing of the final IDA report.

Appendix One Work Flow Process



Appendix Two – IDA Scope Example

TC [Insert Name]

1 Situation

TC [Insert Name] has caused significant damage across Tonga, including damage to housing, crops and infrastructure. The direct effect of the cyclone has included wind damage and flooding which in turn has had a cascading effect of coastal inundation and erosion. Some of the greatest damage has occurred in the areas of [insert locations]. To date, NEMO has received reports of potential damage for these areas.

2 Mission

The National Emergency Management Committee has directed that a coordinated Initial Damage Assessment be undertaken by a national IDA team over the next [insert timeframe either 48 or 72 hour] period.

Because of the limited timeframe within which the assessment is to be completed the scope of the IDA will be as follows:

1. Field assessment teams are to deploy to the following towns and districts [insert towns and districts]
2. Initial damage assessment of other areas across Tonga is to be done remotely and collated via phone and email reports under the direction of the national IDA team leader.
3. The assessment is to be completed and signed off by the controller by [insert date and time].

3 Execution

1. The assessment will be conducted in three phases and broadly follow the process identified in NEMO standard operating procedure xxxxx with modifications to suit local context and operational requirements.

2. **Phase One – Predeployment.**

   This phase will commence immediately and be completed within 24 hours [insert date and time for completion]

3. **Phase Two – Data collection, analysis and field assessments.**

   This phase will commence at [insert date and time – it should be the end of the pre-deployment phase] and will be completed within 48 hours [insert date and time for completion].

4. **Phase Three – Reporting and close-out.**

   This phase will be commence at [insert date and time – it should be the end of the data collection phase] and will be completed within 48 hours.

4. Administration and Logistics

The assessment process will be lead by NEMO with all coordination, administration and logistical support being provided by the emergency operation centre.

- Cost recovery/budgets
- Any other admin and logistic requirements e.g. allowances, hours of work, location of the EOC, reporting times, meals, accommodation, transport,?

5. Command and Control

1. Key leadership and coordination roles for the IDA have been assigned as follows:
    - National controller [insert name]
    - IDA team leader [insert name]
    - IT coordinator [insert name]
    - Data and analytics coordinator [insert name]
    - Logistics coordinator [insert name]
    - Welfare coordinator [insert name]
    - Safety coordinator [insert name]
    - Operations/Field team leader [insert name]

Appendix Three – IDA Data Capture Process

IDA Data Capture, Roles, Responsibilities and Key Tasks.				
	Roles	**Purpose**	**Responsibilities**	**Key Tasks as at 25 March 2021**
Pre-activation phase	NEMO Kobo Coordinator	Ensure IT systems and processes are in place prior to an event for IDA field data capture.	Equipment Data collection SOP's Training.	• Obtain tablets and devices. • Identify and train field teams. • Review/revise and maintain IDA form for Kobo. • Develop terms of reference for assessors.
	IT Advisor	Support NEMO Kobo coordinator.	Ensure all aspects of IT infrastructure are functional prior to an event.	• Configure devices, install apps • Set up IT infrastructure – servers, passwords, design and develop connection protocols. • Develop data privacy policy for teams.
	NEMO officers (outer islands)	Support NEMO Kobo coordinator.	Maintain readiness to support IT data capture.	• Maintain tablets and devices in their locations • Support NEMO Kobo coordinator and train teams in their locations.
Activation Phase	IDA IT Coordinator	To ensure IT support is available within the EOC including hardware, software and connectivity to IDA teams across all phases for the event.	Prepare an IT plan to support the deployment	• Issue/distribute devices • Support IDA team leader to develop schedules, brief and train teams prior to deploying. • Support field teams – end of day down load, charging and daily re-issue
	IT Advisor	To provide IT support to the EOC including hardware, software and connectivity to IDA teams across all phases for the event.	Provide technical support for the design of survey forms using Kobo or similar platforms. Support both field teams and data analysis teams with connectivity, trouble shooting and all IT related issues.	• On-hand support to trouble shoot connectivity and device functionality issues.
	IDA Data Coordinator	To design end to end process for data capture (Kobo), analysis and reporting for the event.	Identification of - data capture methodology, IT resource needs, composition of assessment teams, receive and analyse data. Produce final IDA report	Ensure data is uploaded daily. Compile data sets into logical groupings for analysis. Compile data tables and analysis to support reporting

Appendix Four - IDA Report Template

Initial Damage Assessment For [Event Name]

This Initial Damage Assessment (IDA) has been prepared by the National Emergency Management Office to update the National Emergency Management Committee as well as partners and stakeholders on the impacts of [Event Name] in [Location e.g. all of Tonga, Ha'apai, Vava'u etc….]

Scope of this assessment:

See Appendix 1 for an example of an IDA Scope. Insert relevant sections of the scope here to inform the reader of what was assessed and where. Do not repeat the entire scope in this section. If necessary it can be included as an appendix. The controller will consult with the NEMC and IDA team leader to determine the scope of the IDA. It will define the area of operations, time-frame for completion, the type of data and information required and who will be the key participants in the IDA process. The scope will also acknowledge that other Ministries, partners and NGO's will be active at the same time and will also signal to them what their contribution to the assessment and report will be.

Period covered by this assessment:

Insert the start and end dates from the IDA from the scope.

Date of Release:

Insert the date the IDA was endorsed by the NEMC or alternatively approved by the controller.

Executive Summary

Use this section to provide a high-level summary of key findings organized under the following headings.

See appendix 1 for an example. Keep the executive summary short and limit the content to the first page of the IDA. ***It must include recommendations and should be written last.***

Event Milestones

Points to include under this heading will come from the situation overview section

Impact and Damage Assessment Summary

Points to include under this heading will be the key points from the damage and impact assessment section

Response Summary

Points to include under this heading are:

Recommendations

-
-
-

Situation Overview

Use this section to communicate how the situation has unfolded to the present point. In the case of a tropical cyclone for example describe origin, pathway, changes in category, relevant Fuamotu Tropical Cyclone Warning Centre (FTCWC) updates. Consider inserting graphic of forecast track map. Include information on tides and wind speeds if relevant to the assessment. See appendix 6 for an example of an IDA situation overview.

Initial Impacts and Damage Assessment

This section combines data and insights from the EOC, field assessors, and where relevant, clusters, ministries, partner agencies and NGO's. It is broken down into two main sub-sections – an Impact Assessment and a Damage Assessment. Each of these subsections can be broken down into more headings to suit the context. See appendix 7 and 8 for an example of IDA impact and damage assessment.

Impact Assessment

Consider organizing this section under geographic headings starting with the most impacted areas first and the least impacted last. Describe the impacts starting with date and time. What caused the damage in these locations – e.g. wind, storm surge, sea swell, king tide. Where was the most damage? Where was there no damage? See appendix 7 for an example of an impact assessment.

Damage Assessment

This section will describe what has been damaged the most e.g. houses, crops, public infrastructure. Use this section to display data captured by assessors in the field. Actively seek cluster coordinator comments as well as comments from town officers, relevant ministries and partners for their insights on the data. Consider using tables to display data and photos to reinforce key issues and findings. See appendix 8 for an example of a damage assessment.

Response Overview

The response overview will set out the key activities carried out by agencies (Police, HMAF, TFES, Red Cross etc) since activation. The focus should be on the activities that supported communities and households and the agency involved. Restoring services like power, water and communications, clearing roads for access, distribution of relief items and essential supplies such as food, tarpaulins and fuel for generators are to be included. See appendix 9 for an example of response overview.

Conclusion

This section provides key insights for the next stage of the response and transition to recovery. Consider developing some end-state objectives for the response to signal to agencies the point at which response finishes and the machinery of recovery takes over. Insights can come from a variety of sources – the EOC, clusters, ministries, NGO's and town officers.

Appendix Five - IDA Executive Summary Example

Executive Summary for TC Harold

Event Milestones

Date	Event
7 April	FTCWC was activated to provide 'Tropical Cyclone Advisory' to trigger the preparedness and response.
8 April	Government of Tonga declared 'State of Emergency' for the preparedness and response to TC Harold.
9 April	TC Harold entered Tongan waters around 1am in the morning; impacted Tonga, mainly Tongatapu, 'Eua and Ha'apai. NEMO mobilized Initial Damage Assessment (IDA) team to the field. No loss of life reported. Damages to some households in Tongatapu and 'Eua. Storm/sea surge combined with high tide inundated coastal areas in Tongatapu, 'Eua and Ha'apai. There are some reports of major damage to public infrastructure in coastal areas, especially to the wharf and roads around the coastal sides in Tongatapu, 'Eua and Ha'apai. HMAF and Tonga Police mobilized to clear the road blockade from fallen trees, fallen archway, debris and other materials deposited by cyclone on main roads. 7pm- NEMC meeting called to discuss the impact of TC Harold to Tonga and plan for the response.
11 April	9am- Joint NEMC and National Task Force meeting was called to discuss COVID - 19 and TC Harold Response 2pm- Development Partners meeting was called to update on impact and plan for response
14 April	Inter cluster meeting called at 12pm to discuss the IDA report and response.

Impact Damage Assessment Summary

No loss of life and serious injuries were reported across all of Tonga. A number of people required shelter in evacuation centers. All have returned to their homes after the cyclone except 1 family in Angaha village on 'Eua Island.

People sheltered in Evacuation Centers (ECs)	
Tongatapu	2254
Eua	289
Ha'apai	135
Vava'u and Niuas	None

Impact Assessment by Island Group	
Tongatapu	• 16 houses totally damaged, 68 have major damage and 298 minor damage. • 754 Households (HHs) are needing Non Food Items (NFIs) and other supports including agricultural tools. • 189 HHs reporting damage to their toilets and 75 HHs have reported problem on water tanks
'Eua	• 15 houses have been completely damaged. 14 has major and 17 minor. The wharf has been damaged. • Road connecting Tufuvai village to 'Ohonua has been damaged. • Government office buildings of MOI, Fisheries, Tourism and others have been damaged.
Ha'apai	• The Wharf in Pangai, Holopeka Road, the causeway to Foa damaged

Response Summary

- NEMO with Tonga Police, Tonga Geology and Caritas distributed tents to houses with major/complete damage, and other Non-Food Items (Hygiene kits, Water container, and solar lights) to the affected communities in Tongatapu 4 houses in 'Atataa Island and 24 houses in Tongatapu.
- Relief Team sent to 'Eua on 13 April, severely damaged 15 houses in 'Eua already provided relief items.

Recommendations

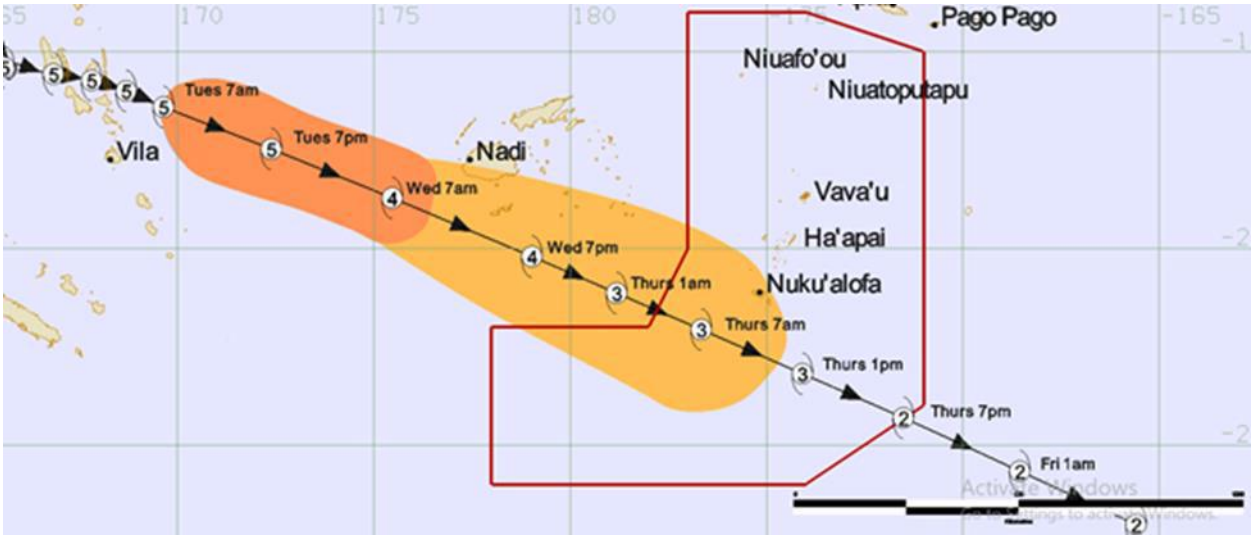
-
-
-

Appendix Six IDA Situation Overview Example

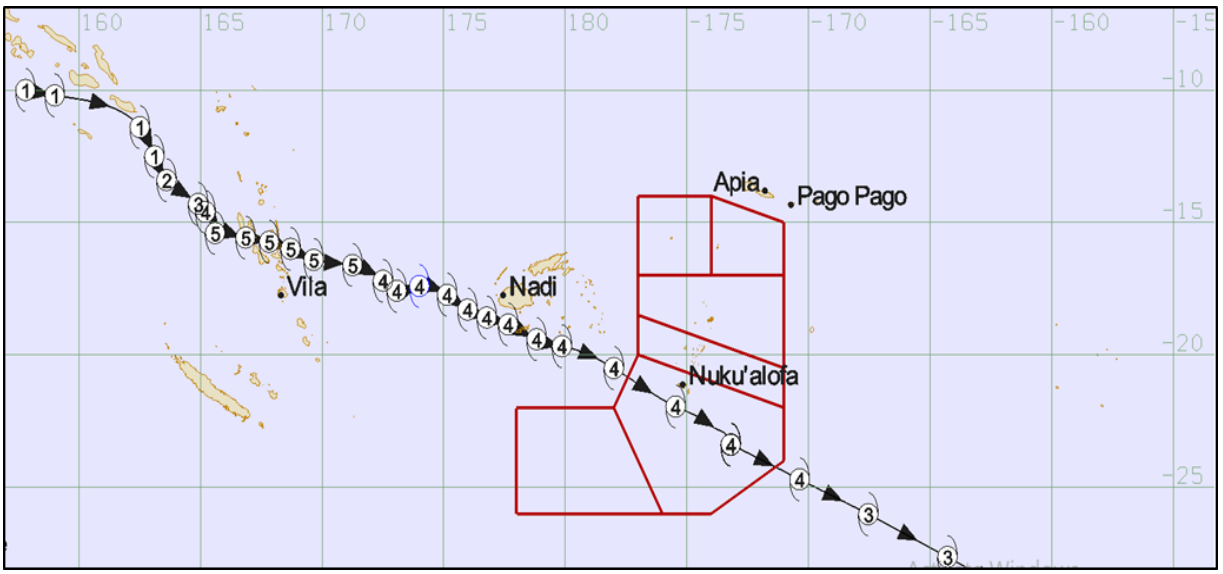
Situation Overview for TC Harold

Tropical Cyclone Harold (cat-5 made landfall on the island of Espiritu Santo in northern Vanuatu on 7th April with destructive winds as high as 235km/h. The cyclone passed directly over Santo where hundreds of people sheltered in evacuation centres. TC Harold tracked towards Fiji with Category-4 strength and caused widespread flooding across Fiji as heavy rain and strong winds hit the country on 8th April. TC Harold then moved towards Tonga still with Category-4, entered Tonga water around 1am, 9 April. The cyclone left Tongan water by around 7pm 9 April.

As per the report/presentation from Met Service at NEMC meeting at 11 April, the conditions of the cyclone's arrival was combined with the high tide and the full moon, therefore, sea was running inland about one metre above its usual highest level. Tsunami-like waves hit Tongatapu and 'Eua coastlines. The below is a real timeline track of TC Herald recorded by FTCWC.



The forecast track map and the associated time of travel for Severe TC Harold, which was expected to arrive within 48hrs: FTCWC activation track.



The analysis track of Severe Tropical Cyclone Harold. This Analysis track still needs to be finalized by FTCWC.

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Appendix Seven IDA Impact Assessment Example

Impact Assessment for TC Harold

All of Tonga Assessment:

TC Harold started impacting Kingdom of Tonga starting 1:00am 9 April, 2020. Strong winds were felt across Tongatapu, 'Eua, Ha'apai and Vava'u. Sea surge and heavy damaging swells combined with a king tide impacted most of the coastal areas. No injuries or deaths were reported in Tonga. There are some serious damages to wharves and public infrastructure along the coastal areas in Tongatapu,

Ha'apai and 'Eua. There is minimal damage in Vava'u. The crops in Tongatapu and 'Eua also suffered significant damages. No damages have been reported from Niuatoputapu and Niuafo'ou.

'Eua Island Assessment

'Eua has been hit hardest by TC Harold. Total 289 people were sheltering in Community Evacuation centres, Later Day Saints Church Hall, Free Wesleyan Church halls and to the Catholic Church facilities. All evacuees have now returned to their home but 1 family of 6 members in Angaha village. Storm surge caused severe damage to the wharf, roads and infrastructure. Coastal area of 'Ohonua and Tufuvai has suffered serious damage. The road connecting Tufuvai village to 'Ohonua village has been completely damaged. The cemetery in the area was also inundated and has been damaged. The power/electricity went off in some parts of Island. Restoration work is ongoing. 15 houses are completely destroyed and 31 houses suffering some level of damage.

Damage to the structure at MoI Office, 'Ohonua

Building damaged by the cyclone in 'Eua

Tongatapu Assessment:

A storm surge nearly a metre above the king tide running inland flooded the areas and brought sand, gravel and debris. Storm Surge and wind affected coastal areas with inundation to infrastructures. The wind and sea sprays affected the plantation. No major damage to infrastructures but road blockades in many areas. The power was off in some places due to fallen poles but restored quickly in many parts. Some houses reported damage. Due to

flooding on coastal areas, the roads were blocked by debris deposited by were cleared early by His Majesty's Armed Forces (HMAF), Tonga Police and Tonga Fire and Emergency Services with the support from NEMO. Some minor damage was observed at international berths at Queen Salote Wharf in Nuku'alofa but now operational. Houses including beach resorts, for example, Liku'alofa Beach Resort along the south coast line of Tongatapu have been damaged by winds and floods from storm surge.

Cyclone damage in Atata Island

Naval base damage in Tongatapu

Atata area damage.

House flooding Tongatapu.

Vava'u Islands Assessment.

There are no major damages to people's properties. Plantations are also unharmed. There is minor damage to the wharf in Falevai. Families residing in coastal areas of 'Utungake experienced some impacts of storm surge but no serious harm to the individual and property. There was no major impacts regarding the hospital. All public services in Vava'u are under control despite the strong wind and heavy rainfall.

Ha'apai Islands Assessment.

There has been no serious damage to individual buildings and property in the Ha'apai Island groups. The storm/sea surge combined with high tide has rendered some damage to roads and infrastructure. The main Wharf in Pangai, Foa causeway and Holopeka road which were damaged during TC Tino have suffered major damages again during/by TC Harold too. Electricity went off for the period but has since been restored. Total number of self-evacuees to Later Day Saints (LDS) chapels in Pangai, Fangale'ounga, Faleloa, Loto Foa and Ha'ano were 135 who have returned back to their home after the cyclone passed.

Wharf in front of Velata HMAF base

Foa causeway

Appendix Eight - IDA Damage Assessment Example

The major impact of TC Cyclone was felt around the coastal areas, mainly due to storm/sea surge and strong winds. NEMO mobilised the IDA team comprised of with MOI, HMAF, Tonga Police, TEFS and humanitarian agencies, Tonga Red Cross, Caritas, Tonga National Youth Congress (TNYC) and MORDI mobilised IDA team to conduct the IDA. The IDA team covered 1,700 households in Tongatapu and 889 in 'Eua. There are a total 31 houses destroyed and around 400 houses have suffered some level of damages all together across Tongatapu and 'Eua.

In Tongatapu:

- 23% of households have damage to their house, kitchen or toilet
- 12% of households have poor access to clean drinking water
- 56% of households require non-food item household support

The report from 'Eua is still in verification process. The initial findings indicates similar scenarios in 'Eua too. See the tables below for more detail.

IDA team members reaching to houses during the survey

Damage to Infrastructure

Public Infrastructure around the coast has been severely affected in Tongatapu, 'Eua and Ha'apai. The wharf in 'Eua is completely damaged and not operational. The wharf in Pangai, Ha'apai has also suffered secondary damage after TC Tino. The wharf in Nuku'alofa was also inundated by tidal surge but fortunately there is no serious damage, only debris collected by water. Fortunately sea wall projects in 'Ahau, Kolovai and Navutoka suffered no damage by sea surge and cyclone.

The following table identifies public infrastructure suffering major damage by the cyclone.

Location	Damage
Eua	• The Nafanua Wharf and area around the Wharf • Costal Road from Tufu to 'Ohonua Makaunga Cemetery • Structure at Ministry of Infrastructure, Tourism, Forestry, Government Representative Office building, Fisheries, Building of Women in Crises Centre have varying degree of damage, some are completely damaged.
Ha'apai	• Wharf at Pangai • Holopeka Road • Costal Road at Nomuka • The causeway to Foa

Damage by sea surge to the Nafanua Wharf in 'Eua

Coastal Road at Nomuka, Ha'apai islands

Damage to households

A total of 16 houses in Tongatapu and 15 houses in 'Eua heavily damaged by the cyclone. Out of 1700 houses surveyed in Tongatapu, 366 houses have reported some level of damage to their house. The number in 'Eua is relatively less, total 31 reporting some level of damage out of 889 surveyed. The main problem as seen during the survey and coming out of reports is mainly by inundation of households. Kitchen supplies, bedding and other non-food items are the need for those households which were inundated.

A house damaged by the cyclone in Tongatapu

Inundation by the cyclone

Damage to Public Services

The electricity as it happens in all cyclones was off across the Islands in Tongatapou, 'Eua and Ha'apai. Partly it was switched off by Tonga Power Limited to avoid injuries from fallen power poles and the current flowing on water. It has been restored fully in Vava'u and Ha'apai. Some parts in Tongatapu and 'Eua are still out of electricity. Internet services has been also interrupted during the cyclone, now coming back to normal. Water services to individual households in Nuku'alofa and 'Eua has suffered minor damages, but mostly functioning well. The problem is with the inundation of water source and supply during the cyclone.

Damage to Food and Agriculture

As most of the houses around coastal areas were inundated, existing food reserve in some houses have been damaged by flood water. Agriculture is another main sector impacted by TC Harold. Banana trees and have fallen down in many cases and there is impact into existing food crop, for example tapioca, and also root crops too.

Damage to Tourism sector

Tourism sector, the business which is already to almost closure due to COVID-19 impact, have again been hit hard by TC Harold. The infrastructure supporting tourism, access road and resort itself has been severely damaged in many places, in Tongatapu, ‘Eua and Fafaa Island resort

Fafaa Island, Tongatapu

Damaged house in ‘Atataa island

Appendix Nine IDA Response Overview Example

Response Overview

Timeline

- 9 April- HMAF, TFES and MOI were mobilized on ground to clear the road blockage in main passages. They also cleared fallen trees and branches in residence in Havelu.
- TPL team mobilized on 9th April to restore power in Tongatapu, 'Eua and Ha'apai. Power fully back in Ha'apai. In Tongatapu and 'Eua, around 90% areas have now running electricity. TPL team working to recover power to all places.
- NEMO mobilized Initial Damage Assessment team comprised of inter-agencies both from the government and NGOs in Tongatapu, 'Eua and Ha'apai immediately after the cyclone.

TPL staff members restoring electricity

• On 9 April, NEMO sent the team with tarpaulin to temporarily cover the roof blown away from TC Harold of medical ward in Vaiola hospital.

- Tonga Power Limited has restored power in most of the places and continues working to bring services back to normal in all places
- Joint NEMC/NTF meeting was called at 9am 11 April to discuss response on both COVID-19 and TC Harold. Development partners meeting was called at 1pm to update the situation and discuss the response.
- NEMO has mobilized team on 13 April to 'Atataa and Pangaimotu and distributed
    - 4 tents

- 4 Hygiene kits
- 8 Water container (jerry-cans)
- 16 solar light

Response Activities in Eua

- NEMO has sent an immediate response team to 'Eua with relief items, as below, for the distribution to the families who are on urgent need. Team comprised of NEMO and Tonga Geology.

List of relief items sent to 'Eua

Items	Quantity
Diesel	2 drums (2@200Literes)
Drinking water	20 pack
Hygiene Kit	40
Solar Light	40
Water Container	30
Small tents	10
Chainsaw	2
Oil Pack	30x4@1 litres
Stroke Oil	2x2@4 litres
Petrol drum	1@200 litres

Other Activities

NEMO, in coordination with Caritas, Tonga National Youth Congress and Tonga Red Cross is covering immediate relief distribution to the houses in districts of Kolofo'ou, Kolomotu'a, Kolovai, Nukunuku and Vaini and sending

- 12 tents for the houses completely destroyed
- 36 tarpaulin for the houses with the major damages and
- 48 Hygiene kits for total 48 houses needing hygiene kit supply.