

# POST DISASTER RAPID ASSESSMENT

**TROPICAL CYCLONE GITA // FEBRUARY 12, 2018**  
**GOVERNMENT OF TONGA**





Photo: Malani Wolfigramm/World Bank. Aerial view of damaged building in Tongatapu

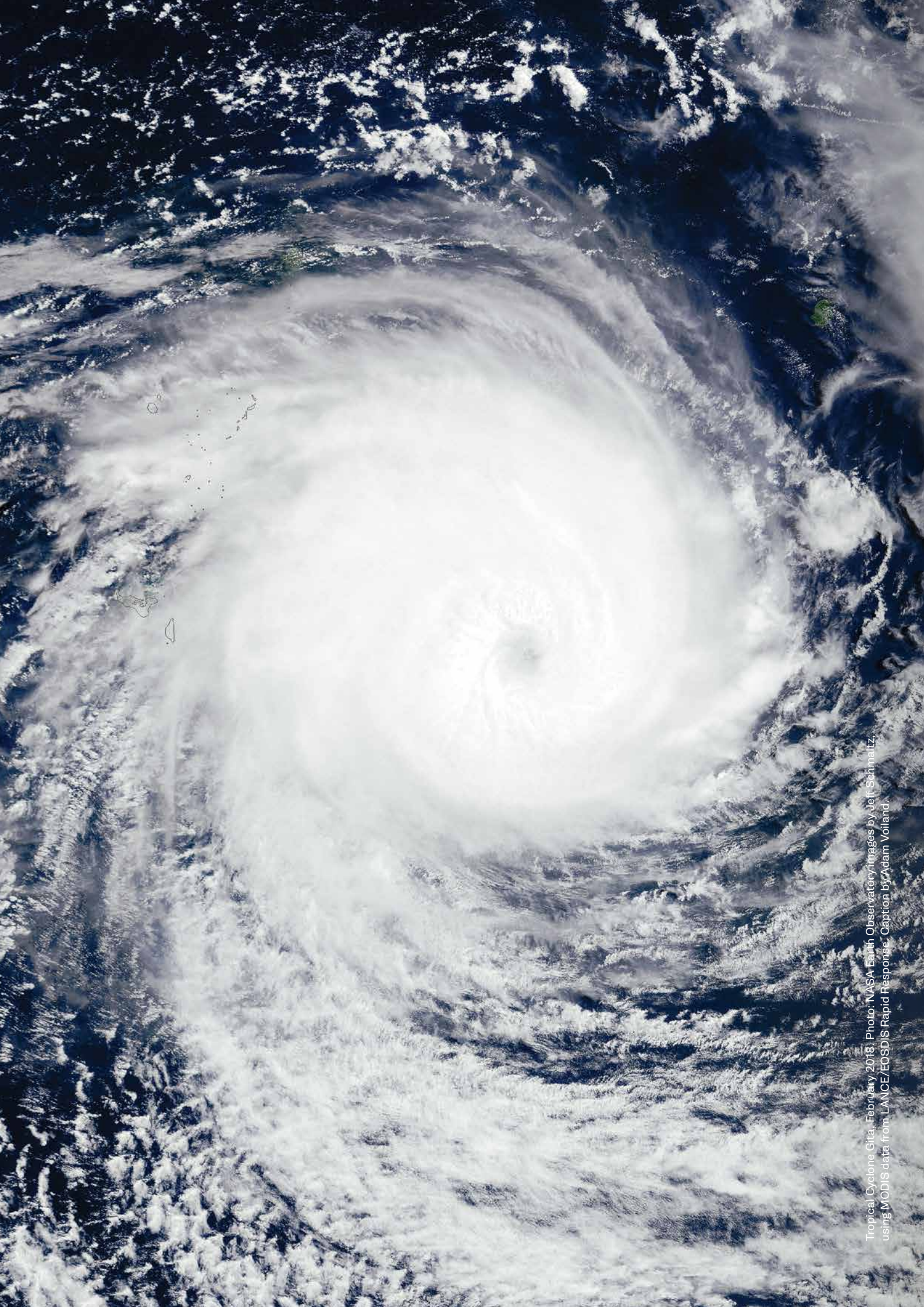




PREPARED BY THE GOVERNMENT OF TONGA, WITH THE SUPPORT OF







Tropical Cyclone Gita, February 2018. Photo: NASA Earth Observatory images by Jeff Schmaltz, using MODIS data from LANCE/EOSDIS Rapid Response. Caption by Adam Voiland.



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# ABBREVIATIONS

|       |   |
|-------|---|
| ADB   | Asian Development Bank                                |
| BBB   | Building back better                                  |
| BNPL  | Basic Needs Poverty Line                              |
| DFAT  | Department of Foreign Affairs and Trade               |
| DRF   | Disaster recovery framework                           |
| DWS   | Disability Welfare Scheme                             |
| ECE   | Early childhood education                             |
| EIIP  | Employment Intensive Infrastructure Programs          |
| FTWC  | Fua'amotu Tropical Cyclone Warning Centre             |
| FY    | Fiscal year   |
| GBV   | Gender-based violence                                 |
| GDP   | Gross domestic product                                |
| GWh   | Gigawatt hour   |
| HIES  | Household Income and Expenditure Survey               |
| ISPS  | International Ship and Port Facility Security         |
| JICA  | Japan International Cooperation Agency                |
| kph   | Kilometers per hour                                   |
| kV    | Kilovolt  |
| MAFFF | Ministry of Agriculture, Food, Forests, and Fisheries |

|         |   |
|---------|---|
| MCCTIL  | Ministry of Commerce, Consumer, Trade, Innovation and Labour  |
| MEIDECC | Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications |
| MFAT    | Ministry of Foreign Affairs and Trade (New Zealand)   |
| MIA     | Ministry of Internal Affairs  |
| MLSNR   | Ministry of Lands, Survey and Natural Resources   |
| MOET    | Ministry of Education and Training  |
| MOFNP   | Ministry of Finance and National Planning   |
| MOI     | Ministry of Infrastructure  |
| MORDI   | Mainstreaming of Rural Development Innovation   |
| MW      | Megawatt  |
| NEMO    | National Emergency Management Office  |
| NGO     | Non Government Organization   |
| NNUP    | Nuku'alofa Network Upgrade Project  |
| NRBS    | National Retirement Benefits Scheme   |
| OIREP   | Outer Islands Renewable Energy Project  |
| PAT     | Ports Authority Tonga   |
| PSA     | Public Service Association  |



|                 |   |
|-----------------|---|
| <b>PV</b>       | <b>Photovoltaic</b>   |
| <b>RSMC</b>     | <b>Regional Specialized Meteorological Centre</b>                             |
| <b>SME</b>      | <b>Small and medium enterprise</b>  |
| <b>TAL</b>      | <b>Tonga Airports Limited</b>   |
| <b>TC</b>       | <b>Tropical Cyclone</b>   |
| <b>TCCI</b>     | <b>Tonga Chamber of Commerce and Industry</b>                                 |
| <b>TDB</b>      | <b>Tonga Development Bank</b>   |
| <b>TNCWC</b>    | <b>Tongan National Centre for Women and Children</b>                          |
| <b>TNYC</b>     | <b>Tongan National Youth Congress</b>   |
| <b>TPL</b>      | <b>Tonga Power Limited</b>  |
| <b>TVNUP</b>    | <b>Tonga Village Network Upgrade Project</b>                                  |
| <b>TWB</b>      | <b>Tonga Water Board</b>  |
| <b>TWMF</b>     | <b>Tapuhia Waste Management Facility</b>                                      |
| <b>UN Women</b> | <b>United Nations Entity for Gender Equality and the Empowerment of Women</b> |
| <b>VWC</b>      | <b>Village Water Committee</b>  |
| <b>WAD</b>      | <b>Women's Affairs Division</b>   |
| <b>WAL</b>      | <b>Waste Authority Limited</b>  |
| <b>WASH</b>     | <b>Water and sanitation</b>   |





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# EXECUTIVE SUMMARY

Tropical Cyclone (TC) Gita passed over the Tongatapu and 'Eua island groups around 11 pm on Monday February 12, 2018. Anticipating the storm to be a destructive Category 5 system, the acting prime minister preemptively issued a Declaration of a State of Emergency on the morning of February 12. Upon landfall, TC Gita had not reached the expected intensity, but it is still the strongest tropical cyclone to impact Tongatapu and 'Eua since TC Isaac in March 1982, with average wind speeds of 130 kph and gusts of up to 195 kph<sup>1</sup>. An accompanying storm surge reached 1 m above normal high-tide levels, and 200 mm of rainfall fell over a 24-hour period, resulting in localized flooding.

Following TC Gita's passage from Tonga, there were reports of significant damage on both Tongatapu and 'Eua. The storm impacted approximately 80,000 people, which is around 80 percent of Tonga's population. The storm brought down power lines; damaged and destroyed schools, resulting in closures; destroyed crops and fruit trees; and damaged public buildings, including the domestic airport, the Parliament building, and Tonga meteorological services. TC Gita also significantly impacted housing, with over 800 houses destroyed and a further 4,000 damaged.

## 1.1 SUMMARY OF DAMAGE AND LOSSES

The total economic value of the effects caused by TC Gita was estimated to be approximately T\$356.1 million (US\$164.1 million). This is equivalent to 37.8 percent of the nominal gross domestic product (GDP) in Tonga<sup>2</sup> and suggests the scale of impact. Of these effects, T\$208.8 million (US\$96.2 million) is attributable to damage and T\$147.3 million (US\$67.9 million) is attributable to losses. Table 1 shows the breakdown of the damage and losses by sector.<sup>3</sup>

TC Gita produced different effects across the different economic and social sectors. The sector that sustained the highest level of damage was the housing sector, which accounts for 53 percent of the total damage cost, followed by the tourism sector, which accounts for 13 percent. The largest level of economic losses is expected in the agriculture sector, which is estimated at 63 percent of the total losses.

1. MEIDECC, "Tropical Cyclone Gita Meteorological Report," February 23, 2018.
2. The share is calculated for the nominal 2017 GDP, which is estimated at T\$941.9 million.
3. All data shown in tables and figures were collated by the Post-Disaster Rapid Assessment teams unless otherwise noted.

**TABLE 1. Summary of Disaster Effects by Sector (T\$ millions)**

|                               | DAMAGE        | LOSSES        | TOTAL         |
|-------------------------------|---------------|---------------|---------------|
| <b>Productive Sectors</b>     | <b>54.88</b>  | <b>138.47</b> | <b>193.35</b> |
| Agriculture                   | 5.10          | 92.38         | 97.48         |
| Commerce and Industry         | 23.48         | 31.79         | 55.27         |
| Tourism                       | 26.30         | 14.30         | 40.60         |
| <b>Social Sectors</b>         | <b>131.48</b> | <b>2.74</b>   | <b>134.22</b> |
| Housing                       | 111.60        | 0.02          | 111.62        |
| Education                     | 19.78         | 2.17          | 21.95         |
| Health                        | 0.10          | 0.55          | 0.65          |
| <b>Infrastructure Sectors</b> | <b>22.46</b>  | <b>6.08</b>   | <b>28.54</b>  |
| Energy                        | 13.41         | 3.73          | 17.14         |
| Public Buildings              | 5.47          | 1.00          | 6.47          |
| Transport                     | 2.32          | 0.76          | 3.08          |
| Water and Sanitation          | 1.26          | 0.59          | 1.85          |
| <b>TOTAL</b>                  | <b>208.82</b> | <b>147.29</b> | <b>356.11</b> |

Source: Estimations by Assessment Team based on government figures.

Although the cyclone destroyed physical assets in February 2018, production losses and associated higher costs of production will linger for some time. The negative impact of the disaster on overall economic conditions in the country will thus be felt for several years to come.

## 1.2 SUMMARY OF MACROECONOMIC IMPACT ASSESSMENT

Growth has remained relatively robust in Tonga in recent years, averaging over 3 percent during the three years from FY2013/14 to FY2015/16 (fiscal years end in June). Growth was projected to be to around 3.0 percent in FY2017/18 and 3.9 percent in FY2018/19 before moderating to around 3 percent in FY2019/20. Over the medium term, growth was expected to ease to around 2 percent as construction projects wound down.

The outlook for economic activity over the next two to three years is now likely to be significantly affected by Cyclone Gita-related recovery and reconstruction activities and the extent to which losses in the agriculture and tourism sectors persist. Losses are expected to be substantial in both FY2017/18 and FY2018/19 but to diminish rapidly from FY2019/20 onward. Over the next three to four years, losses will be partially offset by reconstruction and repair activity for housing, public buildings, and schools, which is projected to begin in the last few months of FY2017/18 and ramp up over the two following years before scaling back in FY2020/21 and after. Growth is now expected to slow to around 0.3 percent in FY2017/18, before a strong rebound in FY2018/19 and FY2019/20.



Given the proportion of the population living in rural areas, the cyclone is likely to have had substantial impacts on Tonga's poorest and most vulnerable, mainly through its effect on small-scale and subsistence farming activities. While reconstruction activities are expected to provide a substantial boost to the economy, these should be carefully sequenced and prioritized, given domestic capacity and financing constraints. Overall, in light of the limitations of the Rapid Assessment, which reflects only the information available at the time of writing, the projections for domestic economic activity should be treated with a substantial degree of caution.

In the wake of TC Gita, imports will rise markedly above the levels forecast before the cyclone, while exports of agricultural produce will likely decline, in line with the projected effects on economic activity in the agricultural sector. Looking forward, imports will likely remain higher than previously expected, in line with the additional reconstruction activity now forecast to take place over the next three to four years.

In the immediate aftermath of the cyclone, donor contributions and insurance payouts contributed significantly to the government's Emergency Fund (in the order of T\$23 million), and this will be used to finance many of the most urgent recovery needs. The cabinet has approved exemptions to the consumption tax and various excise taxes for individuals and businesses affected by the cyclone. Some ministries have reallocated some resources to cyclone recovery activities, which will require additional spending to ensure the continued delivery of important services.

In FY2018/19 and over the next few years, the budget position will be critically affected by the total cost of cyclone recovery and reconstruction needs, the proportion of these needs that are financed by government, and the extent of financial assistance from development partners. If it is assumed that around half of the projected T\$326.8 million in recovery needs is ultimately financed through the government budget, this could create an additional fiscal need of up to 6 percent of GDP per year over the next three fiscal years (FY2018/19 to FY2020/21). On the other hand, domestic revenue collection is likely to be lower than previously thought, in line with the projected decline in economic activity (relative to pre-cyclone forecasts), and given the tax exemption measures mentioned above.

### 1.3 HUMAN AND SOCIAL IMPACTS

Communities and individuals affected by TC Gita will require continuous support, intervention, and monitoring to recover. Vulnerable groups in particular will require intervention. Disaster events can also create new vulnerabilities by impacting employment and livelihood-generating abilities, personal safety, public health and sanitation, household efficiency, and food production. Accordingly, restoration of schools, housing, and water supply is considered a priority to minimize the cyclone's social and human impacts.

In response to the cyclone, the Government of Tonga for the first time used existing social protection systems to disburse emergency disaster assistance to the most vulnerable. Under the government's two core social assistance programs, namely the Social Welfare Program for the Elderly and the Disability Welfare Scheme, existing beneficiaries received a one-time top-up payment, in addition to their regular monthly payment, to help them meet their most pressing needs. It is estimated that the disaster assistance reached over 3,500 beneficiaries, or 20,000 people (20 percent of the population), totalling T\$800,000.

### 1.4 SUMMARY OF RECOVERY AND RECONSTRUCTION NEEDS

Table 2 provides a summary of the estimated costs for recovery and reconstruction. Total recovery and reconstruction is estimated at T\$326.8 million (US\$150.6 million). Of this amount T\$73.0 million (US\$33.7 million) is required for immediate recovery (to June 30, 2018), T\$95.4 million (US\$43.0 million) is required for short-term recovery (FY2018/19), and T\$158.3 million (US\$72.9 million) is required for medium-term recovery (FY2019/20–FY2020/21).

**TABLE 2.** Recovery Needs by Sector (T\$ millions)

|  | IMMEDIATE<br>RECOVERY<br>NEEDS | SHORT-TERM<br>RECOVERY<br>NEEDS | MEDIUM-TERM<br>RECOVERY<br>NEEDS | TOTAL<br>RECOVERY<br>NEEDS |
|--|--------------------------------|---------------------------------|----------------------------------|----------------------------|
| <b>Productive Sectors</b>                            | <b>37.79</b>                   | <b>12.63</b>                    | <b>6.61</b>                      | <b>57.03</b>               |
| Agriculture  | 0.99                           | 2.73                            | 5.11                             | 8.83                       |
| Commerce and Industry                                | 4.30                           | 7.00                            | 1.50                             | 12.80                      |
| Tourism  | 32.50                          | 2.90                            | NA                               | 35.40                      |
| <b>Social Sectors</b>                                | <b>14.40</b>                   | <b>77.60</b>                    | <b>48.50</b>                     | <b>140.50</b>              |
| Housing  | 5.80                           | 72.10                           | 40.50                            | 118.40                     |
| Education  | 8.50                           | 5.50                            | 8.00                             | 22.00                      |
| Health   | 0.10                           | NA                              | NA                               | 0.10                       |
| <b>Infrastructure Sectors</b>                        | <b>15.61</b>                   | <b>2.68</b>                     | <b>87.78</b>                     | <b>106.07</b>              |
| Energy   | 13.38                          | 0.00                            | 86.20                            | 99.58                      |
| Public Buildings                                     | 0.31                           | NA                              | 0.70                             | 1.01                       |
| Transport  | 0.68                           | 1.58                            | 0.88                             | 3.14                       |
| Water and Sanitation                                 | 1.24                           | 1.10                            | NA                               | 2.34                       |
| <b>Employment, Gender,<br/>and Social Protection</b> | <b>5.23</b>                    | <b>2.52</b>                     | <b>15.45</b>                     | <b>23.20</b>               |
| <b>TOTAL</b>   | <b>73.03</b>                   | <b>95.43</b>                    | <b>158.34</b>                    | <b>326.80</b>              |

Source: Estimations by Assessment Team based on government figures.

Note: NA = not applicable. A detailed breakdown of needs is included in each sector assessment.



## 1.5 WAY FORWARD

The recovery needs that were identified during the Post-Disaster Rapid Assessment process are not linked to the availability or form of recovery funding, but are driven by the analyses of sectoral needs. Given the extent of identified needs and the limited resources, the first step should be to prioritize the sectors for recovery and reconstruction based on the available financial envelope and a number of strategic considerations. A criteria-based prioritization of recovery needs across competing sectors will be necessary and could include the following principles:

- Potential for direct and widest humanitarian impact;
- Potential to generate sustainable livelihoods;
- Inclusiveness (pro-poor and pro-vulnerable strategies);
- Balance between public and private sector recovery; and
- Restoration and rebuilding of critical infrastructure and services.

The recovery program, while implemented under the government's leadership, will be carried out in close collaboration and partnership with international donors, the private sector, civil society, and the community as a whole.

### 1.5.1 DEVELOPMENT OF A DISASTER

#### RECOVERY FRAMEWORK

The Post-Disaster Rapid Assessment and similar disaster assessments are an essential component of a successful disaster recovery framework (DRF), which should (i) develop a central vision for recovery; (ii) define guiding principles; (iii) identify primary recovery sectors; (iv) assess government capacity to manage recovery; (v) appoint an appropriate recovery leader; (vi) establish appropriate institutional arrangements; (vii) clarify institutional roles and responsibilities; and (viii) establish coordination mechanisms, conduct funding gap analysis, and mobilize funds.

The DRF will outline needs for the first three years of recovery (2018–2021) as identified in this Post-Disaster Rapid Assessment, including immediate needs (for the first three months), short-term needs (for FY2018/19), and medium-term needs (FY2019/20–2020/21).

### 1.5.2 INSTITUTIONAL AND POLICY SETUP

#### (INCLUDING GOODS AND SERVICES)

Policy and institutional gaps related to implementation can cause challenges for agencies involved in recovery in affected communities. The government will need to immediately identify and address these gaps in order to support an efficient and effective recovery. Currently, there is the need to

- Finalize the housing policy/strategy and other recovery-related policies that have yet to be finalized;
- Confirm coordination mechanisms on the ground among government stakeholders, the private sector, development partners, communities, and civil society organizations;
- Ensure the availability and on-time release of funds to line ministries for implementing projects; and
- Increase implementation capacity within ministries to support reconstruction activities.









# 2

## INTRODUCTION

### 2.1 DISASTER RISK PROFILE OF TONGA

Tonga is exposed to a range of natural hazards and is frequently impacted by severe weather. It is ranked second (behind Vanuatu) as most disaster-prone country in the world, according to the 2016 World Risk Index.<sup>4</sup> The country is located in an area known for the occurrence of frequent tropical cyclones with damaging winds, rain, and storm surge. It is also located within the Pacific Ring of Fire, which aligns with the boundaries of tectonic plates and is associated with extreme seismic and volcanic activity, and hence with strong earthquakes and tsunamis.

Tonga has been affected by multiple devastating disasters in the last few decades, the most recent being Tropical Cyclone Ian in 2014, which destroyed almost 1,000 homes and buildings in the Ha'apai island group. In 2009, a magnitude 8.1 offshore earthquake generated a tsunami that resulted in nine fatalities and destroyed over half the houses on the Tongan island of Niuatoputapu.

The effects of natural hazards in Tonga are far-reaching and pose a threat to (among other things) social infrastructure and well-being, agriculture, housing, transport infrastructure, public utilities, and tourism.

Tonga is expected to incur, on average, US\$15.5 million per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Tonga has a 50 percent chance of experiencing a loss exceeding US\$175 million and more than 440 casualties, and a 10 percent chance of experiencing a loss exceeding US\$430 million and more than 1,700 casualties (World Bank 2011). These figures could increase if the impacts of climate change are taken into account.

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4. This index uses “globally available data” to measure every country’s exposure and susceptibility to natural disasters, together with their coping and adaptive capacities. It is available at <http://weltrisikobericht.de/wp-content/uploads/2016/08/WorldRiskReport2016.pdf>.

## 2.2 SOCIOECONOMIC CONTEXT OF TONGA

Situated in the South Pacific, the Kingdom of Tonga consists of 172 islands (36 of which are inhabited) with a total population of around 107,000 people. Almost two-thirds of the population lives on Tongatapu, home to Nuku'alofa, the country's capital. The country stretches over a distance of approximately 800 km from north to south, covering a total land area of 748 km<sup>2</sup>.

Over the last 20 years, per capita GDP has grown by around 1 percent a year; current GDP is US\$428 million (FY2016/17 estimate) and current gross national income is US\$4,060 per capita (FY2015/16 estimate).

Tonga faces many of the geographic and structural challenges common to countries in the Pacific region. Its remoteness, combined with its small size, geographic dispersion, and limited natural resources, provides a narrow economic base and imposes additional costs of trade and transportation. These factors mean that domestic markets tend to be too small for industries to benefit from economies of scale. Tonga is highly dependent on remittances from abroad (estimated at around 30 percent of GDP) and donor aid flows. Agriculture, fishing, and tourism account for most export earnings.

Tonga remains vulnerable to external shocks (due in part to its narrow economic base), and this vulnerability has been compounded significantly by a number of recent natural disaster events, including TC Ian in 2014, which resulted in total damage and losses of approximately US\$50 million (11 percent of annual GDP). In any given year, Tonga is likely either to be hit by a major natural disaster or to be recovering from the previous one.

The government has been successful in controlling debt in recent years, with the ratio of public and publicly guaranteed external debt in present value terms to GDP gradually declining, from 35.7 percent in FY2011/12 to 34.1 percent in FY2014/15.

## 2.3 TROPICAL CYCLONE GITA

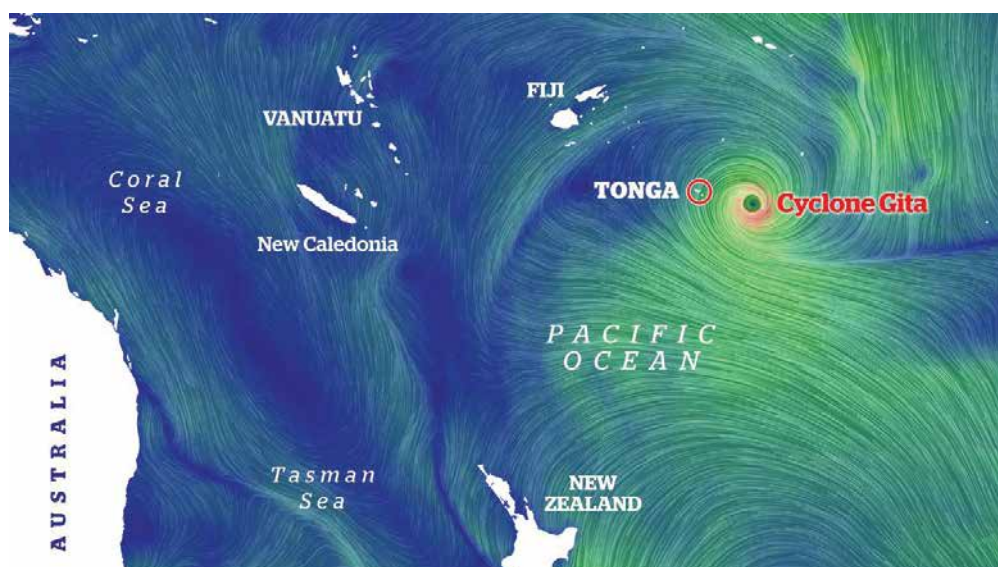
TC Gita passed over the Tongatapu and 'Eua island groups around 11 pm on Monday February 12, 2018. Anticipating the storm to be a destructive Category 5 system, the acting prime minister preemptively issued a Declaration of a State of Emergency on the morning of February 12. Upon landfall, TC Gita had not reached the expected intensity, but it is still the strongest tropical cyclone to impact Tongatapu and 'Eua since TC Isaac in March 1982.

The center of the tropical cyclone system was approximately 100 km in diameter and passed just to the south of Tonga's capital, Nuku'alofa. Nuku'alofa sustained constant winds and was affected by the strongest section of the cyclone's eyewall, with average wind speeds of 130 kph, and gusts of up to 195 kph recorded. An accompanying storm surge reached 1 m above normal high tide levels, and 200 mm of rainfall fell over a 24-hour period, resulting in localized flooding. The preemptive State of Emergency declared the morning of February 12 was accompanied by a 9 pm curfew in Nuku'alofa's central business district. Over 4,000 people self-evacuated to 120 evacuation centers, of which 108 were in Tongatapu and 'Eua. Owing in part to these precautionary measures, there was no loss of life.

Following TC Gita's passage from Tonga, there were reports of significant damage on both Tongatapu and 'Eua. The storm impacted approximately 80,000 people, or around 75 percent of Tonga's population. It brought down power lines; damaged and destroyed schools, resulting in closures; destroyed crops and fruit trees; and damaged public buildings, including the domestic airport, Parliament building, and Tonga meteorological services. TC Gita also significantly impacted housing, with over 800 houses destroyed and a further 4,000 damaged.



**FIGURE 1.** TC Gita as it approaches Tonga on February 12, 2018.



Source: Wikimedia Commons

## 2.4 GOVERNMENT AND HUMANITARIAN RESPONSE

On February 12, before TC Gita made landfall, the government issued a 28-day Declaration of a State of Emergency and encouraged people to seek shelter. This declaration was later extended to April 9, 2018. In total, 108 shelters were activated in Tongatapu and 'Eua, while 12 were activated in the Ha'apai group of islands. Other precautionary measures were undertaken as well, such as shutting down the power grid on Tongatapu, and imposing an evening (9 pm) curfew in the Nuku'alofa central business district on February 12. The curfew was extended to April 9.

In the wake of TC Gita, the Government of Tonga has led and continues to lead response efforts, with the assistance of 10 humanitarian clusters led by government ministries: these clusters include shelter, education, water and sanitation (WASH), food security and livelihood, safety and protection, telecommunications, essential services (primarily electricity), logistics, economic and social recovery, and infrastructure and transportation. Humanitarian partners, international and national Non Government Organizations (NGOs), foreign governments, donors, and civil society are supporting the government-led response. The government has also implemented a range of social protection programs to support households, including provision of additional funds to the elderly and people with disabilities.

To assess the socioeconomic impact of TC Gita and assist in mobilizing the resources needed for recovery and reconstruction, the Government of Tonga requested that a Post-Disaster Rapid Assessment (Rapid Assessment) be conducted. The assessment was supported by the European Union, United Nations, World Bank, and Asian Development Bank (ADB), as well as other regional organizations and bilateral partners, including the Pacific Community (SPC).

## 2.5 METHODOLOGY

This assessment was led by the Government of Tonga, and was conducted by a multidisciplinary, multi-agency team comprising the World Bank, ADB, UN agencies, and other relevant stakeholders. The Post-Disaster Rapid Assessment methodology is based on World Bank damage and loss assessment guidelines (Jovel and Mudahar 2010). It is an approach to analyzing disaster effects and disaster impacts for the purpose of identifying recovery needs, as they are understood from human, sociocultural, economic, and environmental perspectives. The methodology has three main elements: assessment of disaster effects, assessment of disaster impact, and recovery strategy and needs.

### 2.5.1 ASSESSMENT OF DISASTER EFFECTS

The assessment of the disaster effects is based on a bottom-up approach; it captures information about the effects of the event on a sector-by-sector basis, and then aggregates the data to arrive at the total effect of the event on the society and the economy. Assessment of disaster effects is based on the quantification of damage and losses.

- Damage to infrastructure and physical assets is the quantification of public and private sector infrastructure and assets destroyed in the disaster. Damage includes either total or partial destruction of the assets.
- Losses due to disruption of access to goods and services are defined as changes in economic flows and higher costs in production arising from the disaster. They occur until full economic recovery and reconstruction is achieved, in some cases lasting for several years. Typical losses include the decline in output in productive sectors (i.e., agriculture, industry, commerce, mining, and tourism).

### 2.5.2 ASSESSMENT OF DISASTER IMPACT

The assessment of the impact of a disaster encompasses the impact on the macro economy, employment, livelihoods, and households.

- Economic impact at the macro level includes the estimation of the disaster's likely effects on economic performance and the temporary macroeconomic imbalances that may arise from the disaster.
- Social and household impact includes the impacts of the disaster on household and community livelihoods and employment, gender-specific impact, and impact on vulnerable groups such as people with disabilities and the elderly.

## 2.6 RECOVERY STRATEGY AND NEEDS

The assessments of disaster effects and disaster impacts collectively assist with the determination of recovery needs and incorporate the concept of “building back better” (BBB).<sup>6</sup> The Government of Tonga has reiterated the importance of BBB to ensure avoidance of a similar disaster event in the near future. BBB has been selectively applied across sectors and within sectors to ensure a cost-optimized multi-hazard reconstruction.

The identified recovery needs form the basis for determining recovery and reconstruction interventions through a recovery framework. Accordingly, the main goal of this Rapid Assessment is to assist the Government of Tonga in assessing the full extent of TC Gita's impact on the country and, on the basis of these findings, to produce an actionable and sustainable recovery framework for mobilizing financial and technical resources. Recovery time frames considered within this assessment are as follows:

- Immediate (to be completed prior to June 30, 2018)
- Short term (to be completed during the 2018/19 financial year)
- Medium term (to be completed between July 1, 2019, and June 30, 2021)

## 2.7 SPECIFIC CONTEXT OF THIS RAPID ASSESSMENT

The geographical context of this Rapid Assessment covers the two island divisions of Tongatapu and ‘Eua, which were impacted by TC Gita. Annex 1 provides a map of Tonga that shows these two islands.

## 2.8 LIMITATIONS OF THIS RAPID ASSESSMENT

This assessment was completed 38 days after the cyclone event of February 12–13, 2018, and reports only on data received at the time of writing. The estimates of damage, losses, and needs may therefore be underestimated.

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6. BBB is an approach to reconstruction that seeks to reduce vulnerability and improve living conditions while promoting more effective and sustainable reconstruction. BBB uses the opportunity of having to rebuild following a disaster event to examine the suitability and sustainability of reconstruction practices.













# ECONOMIC AND SOCIAL IMPACTS

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## 3.1 MACROECONOMIC IMPACT

### 3.1.1 GROSS DOMESTIC PRODUCT

Growth has remained relatively robust in Tonga in recent years, averaging over 3 percent during the three years from FY2013/14 to FY2015/16 (fiscal years end in June). Growth in FY2016/17 was estimated at 2.8 percent, a slight slowing from the 3.4 percent growth observed in FY2015/16, but still relatively fast in historical terms; it was supported by infrastructure construction and strength in the agriculture and tourism sectors. In addition, private consumption growth has been strong in recent years, supported by remittance flows, in line with the growing number of Tongans participating in seasonal worker programs in Australia and New Zealand.

Prior to Tropical Cyclone Gita, it was projected that the economy would continue to show robust growth over the next few years; the mid-year (December) forecast was for 3.0 percent growth in FY2017/18 (down from the 3.4 percent projected in the FY2017/18 budget), with construction (including of sports facilities), agriculture, and tourism continuing to be the main drivers.

Growth was projected to pick up to around 3.9 percent in FY2018/19 before moderating to around 3 percent in FY2019/20, underpinned by continued strong growth in tourism receipts and construction related to government- and donor-funded investment projects. Over the medium term, growth was expected to ease to around 2 percent as construction projects wound down.

### 3.1.2 PRICES

Inflation was very subdued during the four years from FY2012/13 to FY2015/16, averaging around 0.6 percent, reflecting lower global food and fuel prices. However, it spiked to 7.2 percent in year-average terms in FY2016/17, due to policy-driven tax increases on fuel, alcohol, tobacco, and less-healthy foods and drinks, as well as the effects of dry weather, which pushed up domestic food prices.

Prior to Tropical Cyclone Gita, the outlook was for inflation to ease in FY2017/18 with the passing of one-off effects that pushed up prices in 2017. Over the medium term, the International Monetary Fund (IMF) expected inflation to moderate to around 2.5 percent.

### 3.1.3 TRADE AND BALANCE OF PAYMENTS

The current account deficit has remained sizeable over recent years, driven by construction-related imports, which have largely been financed by capital grants. In FY2016/17, the deficit was estimated to remain at around 12 percent of GDP. Notwithstanding the increase in imports, the strong performance of exports (particularly squash) increased donor grants, and rising remittances have kept foreign reserves at relatively comfortable levels, at around six months of imports.

Prior to the cyclone (i.e., as of the end of 2017), the current account deficit was projected to remain large in FY2017/18, mainly due to capital imports related to construction. Reserves were expected to decline slightly in the medium term due to continued strength in imports and large principal repayments of external debt.

### 3.1.4 FISCAL POSITION

Despite some volatility, Tonga's fiscal balance has averaged a modest deficit of 1 percent of GDP over the eight years to FY2016/17. This reasonably prudent fiscal stance has been supported by the government's continued focus on increasing domestic revenues, which have risen by over five percentage points of GDP from FY2012/13 to FY2016/17, supported by a series of policy and administration reforms. At the same time, total public expenditure has also increased, including for civil servant wages and government-financed capital spending. The government has successfully maintained a stance of avoiding any new nonconcessional borrowing.

The FY2017/18 budget was modestly expansionary, estimating a deficit of 1.3 percent of GDP for the year, while being based on quite optimistic domestic revenue projections. Fiscal results received up to mid-December 2017 indicated that both tax revenues and public spending had been lower than projected in the FY2017/18 budget. Prior to the impact of Tropical Cyclone Gita, the government forecast a broadly balanced budget for FY2018/19 with growing revenues and stable expenditure, although this reflected lower productive spending due to an increase in debt repayments. A much larger fiscal deficit, of about 4.5 percent of GDP, was projected for FY2019/20, however, due to projections of declining grants and higher capital expenditure.

### 3.1.5 POST-DISASTER ECONOMIC OUTLOOK

#### 3.1.5.1 Gross Domestic Product

The outlook for economic activity over the next two to three years is now likely to be significantly affected by TC Gita-related recovery and reconstruction activities and by the extent to which losses in the agriculture and tourism sectors persist. Growth is now expected to slow to around 0.3 percent in FY2017/18, a substantial drop from the mid-year projection of 3 percent and the FY2017/18 budget projection of 3.4 percent. This change reflects the impact of the cyclone on agricultural production, tourism, and the commercial sector, which together account for a 3.5 percentage point reduction in FY2017/18 growth relative to the pre-cyclone baseline. Losses in these sectors are also expected to be substantial in FY2018/19, but then to diminish rapidly from FY2019/20 onward. Over the next three to four years, these losses will be partially offset by reconstruction and repair activity for housing, public buildings, and schools, which is projected to begin in the last few months of FY2017/18 and ramp up over the next two years before scaling back in FY2020/21. The forecast profile depicted in red in Figure 2 accounts for each of these effects.

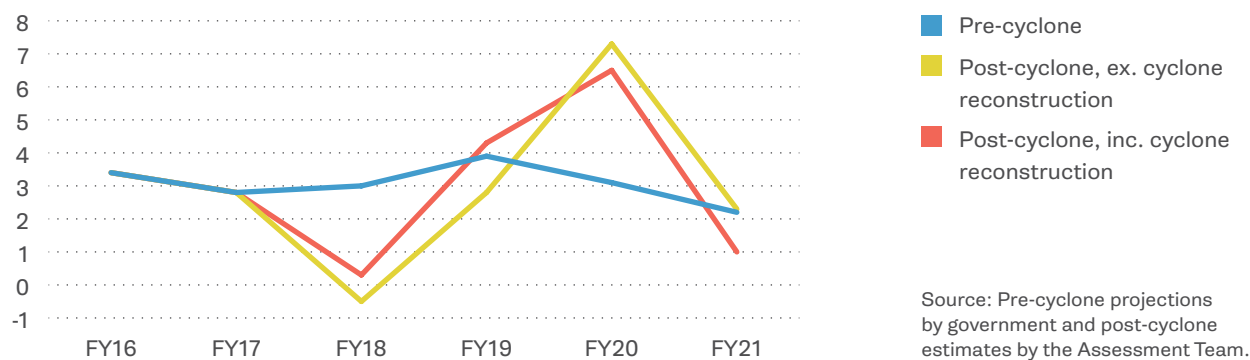
TC Gita's impact on economic activity is expected to be most heavily felt in the agriculture sector. Perennial crops, such as fruit trees, kava, and vanilla, were the most impacted by the cyclone, but annual crops, such as cassava, yam, and taro, also suffered significant losses, while the effects on forestry, livestock, and fisheries were more minor. With around three-quarters of the population living in rural areas, the cyclone is likely to have had a particularly serious impact on some of the poorest and most vulnerable Tongans through its effect on small-scale and subsistence farming activities.

While reconstruction activities are expected to provide a substantial boost to the economy (as shown in Figure 3 and Figure 4), these should be carefully sequenced and prioritized given domestic capacity and financing constraints. The forecast profile assumes that the bulk of housing and public building reconstruction activities will be completed in FY2018/19 and FY2019/20, which would be somewhat faster than the historical experience (e.g., after TC Ian), but still possible if sufficient attention is paid to planning and execution.

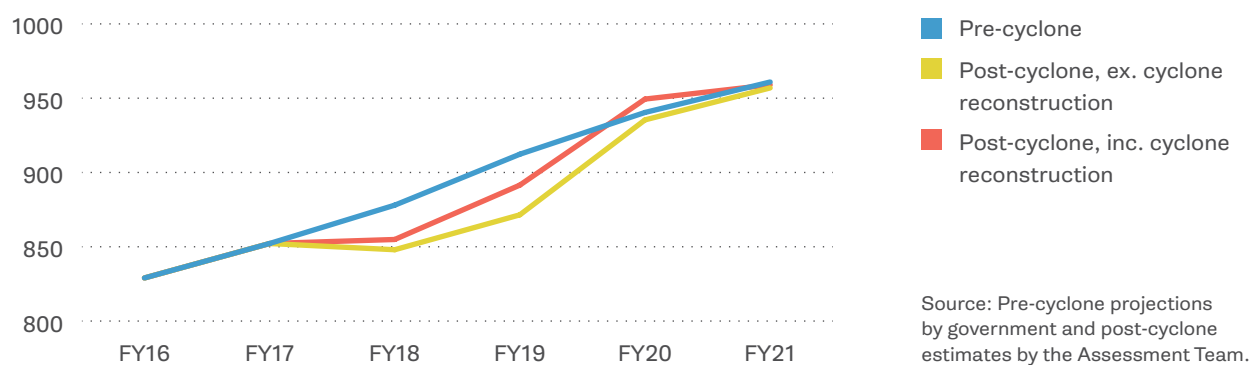
Overall, the projections for domestic economic activity should be treated with a substantial degree of caution, with wide error bands around these central estimates. Given the information collected during preparation of this Rapid Assessment, the economic impacts of the cyclone are quite difficult to estimate with any degree of certainty, particularly for service industries.



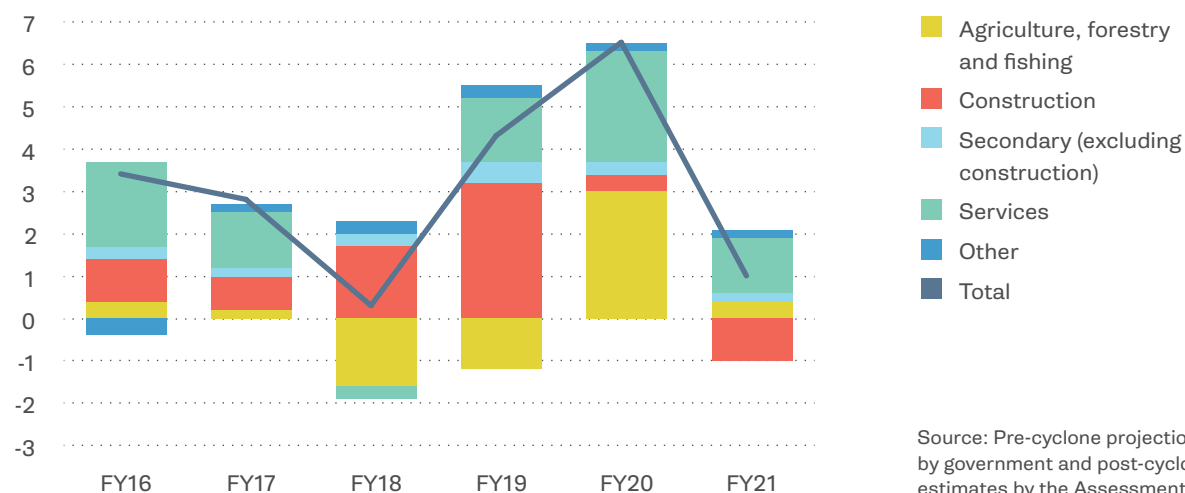
**FIGURE 2. Pre- vs. Post-TC Gita GDP Growth Projections (%)**



**FIGURE 3. Pre- vs. Post-TC Gita GDP Projections (constant FY2010/11 T\$ millions)**



**FIGURE 4. Contributions to Growth, Post-Cyclone Projections, Including Cyclone Recovery (%)**



### 3.1.5.2 Prices

Over the short to medium term, TC Gita is likely to put upward pressure on food prices; there is anecdotal evidence of local market shortages of some fruits and vegetables. While inflation should eventually return to more modest rates as domestic production picks up, year-end inflation may remain somewhat faster than the National Reserve Bank's inflation reference rate of 5 percent a year over the coming quarters, particularly if the prices of imported food and fuel continue to rise relatively quickly.

### 3.1.5.3 Trade and Balance of Payments

Compared with the pre-cyclone forecasts, imports will rise markedly in the wake of TC Gita, while exports of agricultural produce will likely decline, in line with the projected effects on economic activity in the agricultural sector. In the near term, imports of building materials will pick up to meet the most urgent repair and reconstruction needs, while shortages of locally produced fruits and vegetables will also cause imports of food to increase. Looking forward, imports will likely remain higher than previously expected in line with the additional reconstruction activity now forecast to take place over the next three to four years. Foreign exchange reserves had been projected to decline in the medium term even before TC Gita, so there could be some additional pressure on the balance of payments, to the extent that foreign currency needs are not met by increased aid and remittance flows.

### 3.1.5.4 Fiscal Position

In the immediate aftermath of the cyclone, donor contributions and insurance payouts enabled substantial contributions to the government's Emergency Fund (in the order of T\$23 million), which will be used to finance many of the most urgent recovery needs over the next three months. The cabinet has approved exemptions to the consumption tax and various excise taxes for those individuals and businesses affected by the cyclone, though the fiscal cost of these measures (in terms of reduced revenue collection) is not yet clear. A number of government ministries have also reallocated some resources to cyclone recovery activities, so there may be a need for additional spending to ensure the continued delivery of important services.

In FY2018/19 and over the next few years, the budget position will be critically affected by the total cost of cyclone recovery and reconstruction needs, the proportion of these needs that are financed by government, and the extent of financial assistance from development partners.

If it is assumed that around half of the projected T\$326.8 million in recovery needs is ultimately financed through the government budget, this could create an additional fiscal need of up to 6 percent of GDP per year over the next three fiscal years (FY2018/19 to FY2020/21). On the other hand, domestic revenue collection is likely to be lower than previously thought, in line with the projected decline in economic activity (relative to pre-cyclone forecasts), and given the tax exemption measures mentioned above.

In this light, it will be important for the government to

- Prioritize recovery and reconstruction activities based on needs, given limited financial resources and domestic capacity;
- Transparently account for the projected cost of these activities in the budget projections (in part to send a clear message to donors on the scale of cyclone-related financing needs);
- Seek support from development partners to cover these needs, to the extent possible on grant terms so as to avoid adding to Tonga's already substantial public debt burden;
- Preserve fiscal space for critical social spending, including in health and education; and
- Ensure that any policy responses that could hurt revenues are carefully targeted at those affected by the cyclone and are time-bound to contain their fiscal impact.

## 3.2 SOCIAL IMPACT

### 3.2.1 SUMMARY

Tonga faces high unemployment, particularly among youth and women. Gender disparities exist in employment (across all activities) and income distribution. In the 2016 census (Tonga Statistics Department 2017), the primary reasons given for being unemployed were disability, the belief that no paid work was available, and discouragement about by the labor market. There are relatively higher rates of informal sector employment; however, this affords workers little social protection and is most vulnerable to shocks such as disasters.

In response to TC Gita, the Government of Tonga for the first time has used its existing social protection system to disburse disaster assistance to the most vulnerable. Under the government's two core social assistance programs, the Social Welfare Program for the Elderly and the Disability Welfare Scheme, existing beneficiaries received a one-time top-up payment in addition to their regular monthly payment.

**TABLE 3. People in Paid Employment in Tongatapu and 'Eua by Activity, Rural/Urban Split**

| MAIN ACTIVITY<br>(PAID EMPLOYMENT) | TOTAL | TONGATAPU |                                | 'EUA   |                                | NATIONAL<br>(NUMBER OF PEOPLE) |       |
|------------------------------------|-------|-----------|--------------------------------|--------|--------------------------------|--------------------------------|-------|
|                                    |       | NUMBER    | NATIONAL<br>LABOR<br>FORCE (%) | NUMBER | NATIONAL<br>LABOR<br>FORCE (%) | URBAN                          | RURAL |
| Employer                           | 710   | 580       | 81.5                           | 15     | 5.7                            | 300                            | 410   |
| Self-Employed                      | 6,262 | 4,313     | 67                             | 381    | 6.0                            | 904                            | 5,358 |
| Private Sector<br>Employee         | 7,055 | 5,398     | 76                             | 296    | 4.2                            | 2,118                          | 4,937 |
| Public Sector<br>Employee          | 9,296 | 7,818     | 84                             | 241    | 2.6                            | 3,251                          | 6,045 |

Source: Tonga Statistics Department 2017.

The top-up payments were intended to help beneficiaries living in the two affected areas (Tongatapu and 'Eua) meet their most pressing needs in the immediate recovery phase. It is estimated that the disaster assistance has reached over 20,000 people (20 percent of the population), entailing a budget amount of approximately T\$800,000.

Pre-disaster statistics in Table 3 show that the majority of those in paid employment reside on Tongatapu, the island most affected by the disaster. The data indicate the risk that those affected by Gita could transition to informal employment. They also indicate that the majority of the recovery efforts need to focus on rural areas of Tongatapu.

### 3.2.2 EMPLOYMENT

#### Labor Market

According to the 2016 census (Tonga Statistics Department 2017), Tonga's total population is 100,651, with youth (those aged 15-24 years) comprising 18.6 percent of the total. People of working age make up 63 percent (63,754 people). Some 40,623 people, most of them living in the disaster-affected islands of Tongatapu and 'Eua, are economically active. Of these, 33,973 are employed and 6,650 are not; hence the national unemployment rate of 16.4 percent.<sup>6</sup> Among those who are employed (including those who are self-employed), the majority are in the private sector and reside in Tongatapu.

#### Income

According to the 2015/16 Household Income and Expenditure Survey (HIES) (Kingdom of Tonga 2017), total annual household income in Tonga is estimated at T\$586 million. The average per household income is T\$32,530, with average per capita income of T\$5,890. Around three-quarters of total income earned in Tonga is earned by households on Tongatapu (26 percent in urban areas and 52 percent in rural areas) and about 4 percent is earned in 'Eua.

The 2015/16 HIES shows further that only 36.6 percent of those employed are in paid work. The majority are unpaid family workers or workers who receive in-kind gifts, etc. in lieu of cash payment. The majority of those in paid employment live on the disaster-affected islands of Tongatapu and 'Eua. Wages and salaries, business profits, and subsistence (the net value of home-produced and consumed items) generate 65 percent of household income; 20 percent of income is generated from remittances and gifts, 12 percent is generated through rents; and the remainder is made up of income from capital (dwelling and land lease), transfer income (pension, social security, grants, and scholarships) and casual receipts (sale of assets).

6. If subsistence workers are included, the unemployment rate is 34.8 percent (of this share, 27.9 percent are male and 42.9 percent are female).



**TABLE 4. Total Number of People in Paid Employment in Tongatapu and 'Eua by Gender and Youth**

| MAIN ACTIVITY<br>(PAID EMPLOYMENT) | TONGATAPU     |              |                           | 'EUA       |            |                           |
|------------------------------------|---------------|--------------|---------------------------|------------|------------|---------------------------|
|                                    | MEN           | WOMEN        | YOUTH<br>(15–24<br>YEARS) | MEN        | WOMEN      | YOUTH<br>(15–24<br>YEARS) |
| Employer                           | 355           | 213          | 37                        | 12         | 3          | 0                         |
| Self-Employed                      | 2,587         | 1,726        | 440                       | 196        | 185        | 22                        |
| Private Sector Employee            | 3,472         | 1,926        | 1,203                     | 225        | 71         | 48                        |
| Public Sector Employee             | 4,508         | 3,310        | 1,231                     | 151        | 90         | 34                        |
| <b>TOTAL</b>                       | <b>10,922</b> | <b>7,175</b> | <b>2,911</b>              | <b>584</b> | <b>349</b> | <b>104</b>                |

Source: Tonga Statistics Department 2017.

In terms of cash-based income, wages and salaries make up 66 percent of income (ranging from 40 percent in 'Eua to 73 percent in Tongatapu), followed by sales of agricultural produce and handicrafts at 18 percent (Kingdom of Tonga 2017).

### High youth unemployment

The total youth labor force participation rate is 29.6 percent, which includes both paid and unpaid work (the rate for males is 37.3 percent and for females 21.6 percent). Youths comprise about 53 percent of the total labor force (Tonga Statistics Department 2017). Among people aged 15 to 24 engaged in employment, approximately 80.2 percent are engaged in waged labor; this group is divided about equally between the public and private sector. While only 19.8 percent of young people are engaged in self-employment, the majority of self-employed youths reside in the disaster-affected islands of Tongatapu and 'Eua. The particularly high youth unemployment rate for those seeking work—30.3 percent for 15- to 19-year-olds and 21 percent for 20- to 24-year-olds—is concerning, especially since it could be further exacerbated by the cyclone.

### High gender disparities

Not only are there significantly fewer young women than young men in the labor force, there are also significant national aggregate disparities between employed men and women. The national unemployment rate for women is 26.8 percent, compared to 7.6 percent for men.

Only 28.4 percent of women are in paid employment, compared to 45.2 percent of men. In the informal sector, women make up 33 percent of those working in agriculture, fisheries, and handicrafts, while men make up 67 percent.

Table 4 indicates that gender disparities in all activities predated TC Gita in the disaster-affected islands. There is a risk that women and youth affected by the disaster may transition into informal employment and/or unpaid work. Recovery efforts need to tailor programs to focus on women and youth.

### Marginalization of persons with disabilities

According to Tonga's 2016 Population and Housing Census (Tonga Statistics Department 2017), approximately 10.6 percent of the population has some form of disability. Approximately 1.6 percent of the working age population with some form of disability (641 people) is unemployed, approximately 59 percent of which are male and 41 percent of which are women. In addition, 77 percent of persons with disabilities who are of working age and unemployed live in Tongatapu, and 4.2 percent live in 'Eua. Given the lack of employment opportunities in the formal sector, it can be assumed that most working age persons with disabilities would be engaged in the informal sector, particularly as home-based/own-account workers. Because the majority live on Tongatapu, the island most affected by the disaster, it is imperative that recovery efforts include persons with disabilities.

## Large informal sector

Approximately 78 percent of the labor force works in rural/informal sectors. Out of the total employed (33,973), the largest group—comprising 46 percent—is engaged in professions related to agriculture, fishing, and handicraft. Approximately 15 percent of youths (aged 15–24 years) are engaged in these areas.

At the household level, 48 percent of households derive all or some income from agriculture, and 25 percent derive all or some income from handicrafts, with women dominating the handicraft professions (5,199 women obtain income from this area). Of people in professions related to agriculture, fishing, and handicrafts, 9,475 reside in Tongatapu, while 1,312 reside in ‘Eua.

### 3.2.3 GENDER

#### 3.2.3.1 Summary

The Women’s Affairs Division (WAD) of the Ministry of Internal Affairs collaborated with the safety and protection cluster to assist in the planning and conduct of the Rapid Assessment in Tongatapu immediately after TC Gita struck. The findings of the Rapid Assessment made clear that a more detailed survey was needed to capture in detail both the immediate and longer-term needs of women, girls, and children, and in particular the needs of pregnant women, lactating women, and women with disabilities. With close reference to the findings from the safety and protection cluster Rapid Assessment, the situational reports, and other cluster reports produced immediately after TC Gita, the WAD collaborated with UN Women in conducting an assessment in ‘Eua with the intention of filling in data gaps related to safety and other sensitive issues.<sup>7</sup> The survey was conducted on March 13 and 14, 2018, and sought to identify key issues for and needs of women, girls, and persons living with disabilities; identify and connect women and girls with needs arising from gender-based violence (GBV) and support them with services available; and provide informed recommendations for support based on the real needs and issues of women and girls interviewed.<sup>8</sup> The survey intended to explore women’s and girl’s views, experiences, and practices in the post-disaster situation in relation to key aspects of their livelihoods, including economic empowerment, safety issues (GBV, services and psychosocial support), disabilities, social cohesion and integration, and displacement/separation.

Though conducted in ‘Eua, the survey provides a case study of the impacts of TC Gita on both ‘Eua and Tongatapu. The survey found that the effects of TC Gita pose potential risks to the lives of women, girls, and other minority groups, in particular their rights to economic independence, safety and security, and food and nutrition. Women’s livelihoods were and continue to be affected by TC Gita, which caused extensive damage to the plants women use in making their handicrafts. Affected women and children will remain at risk if the impacts of the cyclone are not properly addressed.

#### 3.2.3.2 Assessment of Disaster Effects on Gender

##### Economic empowerment

‘Eua’s economy is driven both by handicrafts and agriculture, with handicrafts predominantly practiced by women. The agricultural and commercial farming in ‘Eua is shared by both men and women. The impacts of TC Gita caused extensive damage to the *fau*, *lou’akau* (pandanus), *hiapo* (mulberry trees), *lafo*, and *alu* (*Epipremnum pinnatum*), which women use to make their handicrafts. The majority of the women in ‘Eua sell their crafts locally, regionally, and internationally, and the sales contribute to the family income. Although some women stated that they were able to salvage some needed plant materials, those materials will eventually be depleted, forcing women to explore other options for producing handicrafts or to consider other small business ventures.

7. The participants were identified in part through a list (compiled by Mainstreaming of Rural Development Innovation, or MORDI) of immediate relief distributions in ‘Eua to affected women and girls. The Women’s Affairs Division identified the number of participants to include in its assessment. The total general population of the overall 15 villages was also considered. A total of 60 participants were identified; however, only 39 were able to attend the four focus group discussions.
8. This section of the Post-Disaster Rapid Assessment report has been informed by the safety and protection cluster initiative for assisting women and girls immediately after TC Gita, which was funded by UN Women and WAD. The project was managed by WAD for the Ministry of Internal Affairs.

### Safety for women and girls (GBV, services and psychological support)

There are no service providers in ‘Eua that offer psychosocial support or counseling. Community members must rely on Tongatapu to access these services, assuming that personal funds are available to cover this expense. Health care providers noted that when women are physically injured through family violence, nothing is reported to the health care system; victims prefer to seek medical treatment in a Tongatapu hospital to avoid the shame and lack of privacy experienced closer to home. This is also the case for sexually transmitted infections or other sensitive health care needs. Following the cyclone, female-headed households reported they felt particularly vulnerable when on the outskirts of town due to lack of power for lighting or charging of phones and the resulting difficulty in calling for help/police. Women in ‘Eua noted that following TC Gita, they sometimes did not feel safe due to their physical location close to the edge of the village and bush area, or due to nearby gatherings with alcohol consumption. Female students also felt unsafe walking home from school after dark. Many female-headed households reported that the damage and loss caused by TC Gita increased their level of stress, which caused them to become easily irritated.

### People living with disabilities

Some feedback from ‘Eua following TC Gita indicated that the needs of people living with disabilities were not met during the emergency response, in particular the need for communication and information. Many evacuees with disabilities did not want to be moved to shelters that lacked facilities to cater for their needs; this situation caused added anxiety and stress. Some female-headed households had the added anxiety of finding extra income to support their families as well as provide for those with disabilities who were not receiving benefits.

### Social cohesion and integration

While repairs to homes are ongoing, reports following TC Gita indicated that the distribution of tarpaulins and other materials did not always meet demand, and that female-headed households were often overlooked. Female-headed households are vulnerable to being overlooked by aid distribution because town officers and district officers record only households headed by widows; they do not record households as female-headed if the women in question have been abandoned or are divorced or separated from their partner. Lactating and young mothers commented on the lack of consideration for their needs in distribution of necessary items such as powdered milk and nappies for babies.

### Displacement/separation

For most of the families that moved to evacuation centers in response to TC Gita, the main concerns were personal safety, access to food and water, and access to working bathrooms. There were reports following the cyclone that shelters often lacked adequate supplies to support the number of evacuees housed there, or did not have the means to provide safe and private spaces for women, children, and lactating mothers. There were also reports that many centers ran out of drinking water quickly, forcing families to ration out what supplies were available. Evacuation centers and church and community halls were often unable to provide facilities such as ramps, bathrooms, or toilets that cater for the specific needs of the elderly and those with disabilities.

### 3.2.3.3 Gender based Recovery Needs

#### Economic empowerment

Recovery efforts aimed at rebuilding agricultural livelihoods for both women and men are needed. Plans should be designed not only to quickly support recovery of economic livelihoods, but also to identify mutually beneficial ways for men and women to work and support each other. New skills need to be taught to women and other craft-producing members of the community using alternative natural materials, recycled materials, or nontraditional materials; skills for producing other types of marketable products should also be taught. WAD should work with key partners such as the Ministry of Agriculture, Food, Forests, and Fisheries (MAFFF), Mainstreaming of Rural Development Innovation (MORDI), and relevant NGOs to address this need.

Seedling programs that distribute non-forest materials used for traditional handicrafts should target women. Programs should seek other plant alternatives to alu, fau, hiapo, and lou’akau, which are in low supply. To aid women who rely on raw materials in making handicrafts, there is a need for coconut replanting as well as sourcing of raw materials from unaffected islands. It may take up to two years to produce enough coconuts for handicrafts. For the women most affected by the crop devastation, microloans and financial literacy assistance will help promote recovery of economic livelihoods. Microlending can provide needed capital to source raw materials needed for handicrafts from unaffected islands. Immediate support should be provided to women to empower them to pursue alternative means of income generation and promote economic independence. Women farmers and female-headed households should receive training in new farming techniques that can accelerate production of fast-growing crops and should be educated on new varieties of food crops that can generate income.



### Safety for women and girls (GBV, services and psychological support)

Many community members were traumatized by the effects TC Gita. Communities need more information about providers of psychological support services—specifically what providers are available, what type of support they can provide, and how to reach them in times of urgent need. Awareness and outreach programs on GBV and its causes are needed to provide information, remove the stigma and shame surrounding GBV, and increase reporting of incidents.

Given that many people turned to church and community leaders following TC Gita, offering those leaders specific training on victim-centered support would be beneficial, as would training for students in school. Counselors are needed in the community and in schools to provide psychosocial support to women and to children returning to school who need individual attention following the cyclone. There is also a need for increased policing of areas where female-headed households are close to the edge of the village and bush areas. Distribution of solar-powered torches for all female-headed households or families with many women under the age of 25 will increase personal safety and avoid risk.

### People living with disabilities

A strong communications network should be created for people living with disability and the elderly. For example, town officers, the Ministry of Police, the Disability Division of the Ministry of Internal Affairs, and other relevant stakeholders should share information on people with disability and the elderly in order to assist with disaster preparedness and response. This effort requires that relevant stakeholders collaborate closely to identify the needs of those with a disability. Workshops and training in disaster preparedness and response should be made available to those with disabilities and the elderly so that they know how to prepare for disasters such as TC Gita. There is also a need for programs that involve disabled persons in socializing and meeting people; this will increase their safety network in preparation for future disaster events. People with disabilities should be invited to information sessions on what government benefits are available to them to assist with disaster recovery. Currently, only a small portion of people living with disabilities in Tonga receive monthly financial assistance from the government, and most disabled people are not entitled to a financial allowance.

### Social cohesion and integration

There is a need for improved social mapping, including updated lists of people with disabilities female-headed households, and elderly people. This information should be shared among town officers, police, the Ministry of Internal Affairs, and aid partners prior to every cyclone season to aid with community preparedness and response. Disaster preparedness training should be made available to the public to help them prepare for future disaster events. This could include training in how to understand and respond to disaster warnings, or what essential items should be stocked by the community in advance of a disaster event.

Feedback from ‘Eua indicates that better mechanisms need to be in place to inform the population of what types of items will be distributed and to whom following a disaster event. In the future, such mechanisms will allow impacted communities to better understand why more vulnerable members of the community are targeted first for aid distribution. For those distributing aid, it will be important to ensure in the future that the needs of lactating and young mothers are considered and items such as milk and nappies for babies are distributed. If powdered milk is discouraged because of limited access to clean water, this decision needs to be communicated. Training should be made available to those responsible for distributing humanitarian relief, such as town/district officers.

### Displacement/separation

During TC Gita, particularly in ‘Eua, church halls were commonly used as evacuation centers. These buildings were not designed or built to house the numbers of people that inhabited them during and after the cyclone. There is a long-term need to ensure that evacuation centers are adequate for their purpose. All shelters should ideally be wheelchair accessible, and they should include well-lit toilet facilities, with clearly delineated showers for both men and women. Each evacuation center should have a radio available to communicate updates and keep evacuees informed.

### 3.2.4 SOCIAL PROTECTION

TCs Gita's impact on the population has created an increasing demand on the social protection system to introduce new poverty-targeted social assistance programs and to expand the coverage of existing programs, such as the disability program.

Recommendations for recovery highlight the need to develop a Poverty Registry, create cash-for-work and public works programs for engaging unemployed youth in rebuilding homes, and promote literacy on climate change and resilience through the social protection programs.

#### 3.2.4.1 Social Protection Sector Background

##### Poverty profile

The Government of Tonga is in the process of calibrating a new national poverty line using the latest (2015/16) HIES data. For the purpose of the TC Gita Rapid Assessment, the Tonga Department of Statistics has provided preliminary results, which show that the average incidence of poverty has risen to 25 percent of households in Tonga. The population of individuals in poverty has also risen to roughly the same rate and is estimated at 25 percent of the total population, or about 26,000 people. It should be noted that this year the government is using the consensual approach for poverty estimation, which provides design-consistent (i.e., representative) household-level poverty estimates for the country (both urban and rural areas).

**TABLE 5. Percentage of Households and Population Living in Poverty in Tonga**

| REGION                  | HOUSEHOLDS (%) |             |           | POPULATION (%) |             |           |
|-------------------------|----------------|-------------|-----------|----------------|-------------|-----------|
|                         | 2001           | 2009        | 2015      | 2001           | 2009        | 2015      |
| Nuku'alofa              | 13.7           | 14.7        | 14        |                |             |           |
| Rest of Tongatapu       | 14.4           | 17.5        | 17        |                |             |           |
| Other Islands           | 9.0            | 17.0        | 47        |                |             |           |
| <b>NATIONAL AVERAGE</b> | <b>12.2</b>    | <b>16.4</b> | <b>25</b> | <b>16.2</b>    | <b>22.5</b> | <b>25</b> |

Source: Tonga Bureau of Statistics, March 2018.

Note: The Tonga Department of Statistics is currently estimating population poverty figures for the regions.

**TABLE 6. Households in Poverty in Tonga by Region (2015/16)**

| REGION                  | POOR HOUSEHOLDS (%) | TOTAL HOUSEHOLDS | HOUSEHOLDS LIVING BELOW THE POVERTY LINE 2015/16 |
|-------------------------|---------------------|------------------|--|
| <b>Tongatapu</b>        | <b>16</b>           | <b>13,096</b>    | <b>2,095</b>                                     |
| Nuku'alofa              | 14                  | 4,175            | 585  |
| Rest of Tongatapu       | 17                  | 8,921            | 1,517  |
| <b>Other Islands</b>    | <b>47</b>           | <b>5,102</b>     | <b>2,398</b>                                     |
| <b>NATIONAL AVERAGE</b> | <b>25</b>           | <b>18,198</b>    | <b>4,550</b>                                     |

Source: Tonga Bureau of Statistics, March 2018.

Note: The household figure for Nuku'alofa is based on aggregating the household figures for Kolofu'ou, Ma'ufanga, and Kolomotu'a.

In previous years (2001, 2009), the poverty estimates were calculated using an approach known as the Basic Needs Poverty Line (BNPL), which is a caloric measure. The two methodologies are very different, and the poverty results cannot be compared. However, the historical poverty rates from 2001 and 2009, along with current poverty estimates for 2015, are shown in Table 5.

The latest poverty calculations show the distribution of poverty to vary significantly in Tonga, with over half of total households in the outer islands (comprising ‘Eua, Ha’pai, Nius, and Vava’u) estimated to be poor (i.e., falling below the poverty line and/or unable to access a basic basket of goods), compared to only 16 percent of households in Tongatapu (Table 6). Tongatapu also comprises 70 percent of the total households in Tonga. Analysis shows rural households are more likely to live in poverty than those in urban areas. To analyze the distribution of poverty for each island, the government is undertaking additional surveys and expanding the sample size of small islands; this should make the data more representative for reporting and address a gap in the HIES data.

The distribution of income and expenditure among households in the 2015/16 HIES shows the outer islands to have a higher proportion of households in the lower income quintiles<sup>9</sup> than those in Tongatapu (both urban and rural), implying that Tongatapu-based households have higher income than those in the outer islands. A large degree of inequality can be apparent, with the average annual household income estimated to be T\$75,000 for the highest quintile and T\$8,500 for the lowest quintile. There is an unequal distribution of income, with around 50 percent of the lowest income households accounting for only 20 percent of national income, and subsequently half of the highest income earning households accounting for 80 percent of national income. It is also important to note that the composition of household income is far more diverse in lower quintiles, with a higher proportion of income derived from other sources, such as remittances and subsidies. The proportion of household income derived from remittances is more significant in the lower-income households than the higher-income, demonstrating the importance of this income source for the poor in Tonga.

## Social protection system

Tonga’s well-functioning social protection system, while small, has provided social assistance to its poor and vulnerable people for over five years. There are two core social assistance programs currently being implemented:

The Social Welfare Program for the Elderly was introduced in September 2012 for Tongans aged 70 years and above. The program is administered by the Tonga National Retirement Benefits Fund (NRBF) on behalf of the government; it currently has 4,043 active beneficiaries and last year paid them roughly T\$2.9 million, 0.31 percent of GDP. Under the program, beneficiaries receive monthly cash payments according to the following age brackets: ages 70–74 years receive T\$70 per month; ages 75–79 receive T\$75 per month; and ages 80 and above receive T\$80 per month. This cascading payment structure was introduced in July 2017. Originally the scheme offered a single monthly payment of T\$65 to all beneficiaries over the age of 75; this was changed to age 70 in July 2014.

The Disability Welfare Scheme (DWS) was introduced more recently (in March 2015) for severely disabled persons. The program is managed and implemented by the Division of Social Protection and Disability, which was created specifically for this purpose under the Ministry of Internal Affairs. The DWS caters to the needs of people with severe physical, intellectual, psychological, or sensory disabilities by providing them with regular cash payments of T\$75 per month (since July 2017); this is an increase from the original payment of T\$65. The scheme currently has 849 active members and in 2017 paid out T\$0.8 million—roughly 0.01 percent of GDP—to its beneficiaries.

Since the introduction of the two programs, the number of beneficiaries for both programs has steadily increased, since the first one was initiated in 2012 (Table 7).

9. To form the quintiles, households are ranked by their level of total annual income and divided into five groups. The 20 percent of households with the lowest annual income are in quintile 1, while the 20 percent of households with the highest income are in quintile 5.



**TABLE 7. Social Protection Beneficiaries and Welfare Payouts Since Program Inception**

|                    | DISABILITY WELFARE SCHEME |                  | SOCIAL WELFARE PROGRAM FOR THE ELDERLY |                   |                      |
|--------------------|---------------------------|------------------|--|-------------------|----------------------|
|                    | NUMBER OF BENEFICIARIES   | BENEFIT PAYMENTS | NUMBER OF BENEFICIARIES                | BENEFIT PAYMENTS  | OPERATIONAL EXPENSES |
| 2012/13            | -                         | -                | 1,307                                  | 1,384,097         | 150,154              |
| 2013/14            | -                         | -                | 2,274                                  | 1,760,265         | 130,652              |
| 2014/15            | 576                       | 500,000          | 3,784                                  | 2,653,550         | 94,160               |
| 2015/16            | 747                       | 675,000          | 3,964                                  | 2,850,362         | 96,000               |
| 2016/17            | 894                       | 810,000          | 4,095                                  | 2,896,888         | 96,000               |
| <b>TOTAL (T\$)</b> |                           | <b>1,985,000</b> |  | <b>11,545,161</b> | <b>566,966</b>       |

Source: Compiled by the Assessment Team based on government data.

Note: The data point for the two programs is different. The Social Welfare Program for the Elderly is from July to June, while for the Disability Welfare Scheme is from January to December.

The Government of Tonga is currently finalizing the design of a youth employability project. This will involve a cash transfer program for secondary school children and will include the development of a Poverty Registry of poor beneficiaries, which will facilitate the targeting of assistance during disasters.

### 3.2.4.2 Assessment of Disaster Effects on Social Protection

Within a week after the occurrence of TC Gita, the safety and protection cluster<sup>10</sup> carried out a Rapid Assessment to understand the immediate needs of people residing in the affected areas of Tongatapu and 'Eua. The Rapid Assessment included new data collected in the field through interviews with displaced households in residential and evacuation centers, as well as disability data provided by the Tongan Red Cross and field observations from sector partners (Safety and Protection Cluster 2018). There were a number of important findings from the Rapid Assessment. First, women would like to be more actively involved within the first 72 hours after a cyclone (this view was expressed by respondents in more than 80 percent of evacuation centers).<sup>11</sup> Women would also like to be more prepared for and involved in decision making. Second, families felt the pressure of having to prioritize emergency supplies in their household spending, which in some instances compromised the special needs of vulnerable family members such as the disabled and the elderly. Third, the evacuation centers were inaccessible for people with limited mobility, especially the elderly and disabled. Lastly, there was a lack of counseling and psychosocial support services available to people facing trauma due to the disaster.

A needs assessment survey of 230 persons with disability was carried out by the Pacific Disability Forum in Tongatapu during the first week of March 2018.<sup>12</sup> The survey highlighted some of the issues being faced by people with a disability following the cyclone, such as assistive devices being damaged and needing replacement. Over 60 percent of the disabled people surveyed had suffered partial damage to their homes, while 7 percent reported destruction of their homes and 30 percent no damage to their homes.

Following TC Gita, the Government of Tonga for the first time used its existing social protection system to disburse disaster assistance to the most vulnerable. On March 8, 2018, existing beneficiaries received a one-time top-up payment of T\$225,<sup>13</sup> which was in addition to their regular monthly payment. The top-up payments were intended to help beneficiaries living in the two affected areas (Tongatapu and 'Eua) meet their most pressing needs and to assist in the recovery process. It is estimated that the disaster assistance has reached over 3,500 beneficiary households, or almost 20,000 people (20 percent of the population), through a financial envelope of approximately T\$0.8 million (Table 8).

10. The safety and protection cluster is led by the Ministry of Internal Affairs (MIA), with representation from local and international NGOs, civil society, and development partners.

11. Interviews conducted by Women's and Children's Crisis Centre, as reported in Safety and Protection Cluster (2018).

12. The survey was funded the New Zealand Ministry of Foreign Affairs and Trade (MFAT).

13. The payment was funded by the Australian Department of Foreign Affairs and Trade (DFAT).

**TABLE 8. TC Gita Social Protection Top-Up Payments in 2018**

| PROGRAM                            | TONGATAPU                              | 'EUA                                   | TOTAL<br>BENEFICIARY<br>HOUSEHOLDS<br>REACHED | TOTAL PEOPLE<br>REACHED | TC GITA TOP-<br>UP PAYMENTS<br>(T\$ MILLIONS) |
|------------------------------------|--|--|---|-------------------------|---|
|                                    | Number of<br>Beneficiary<br>Households | Number of<br>Beneficiary<br>Households |   |                         |   |
| Disability Welfare Scheme          | 493                                    | 41                                     | 534   | <b>2,937</b>            | <b>0.12</b>                                   |
| Social Welfare Program for Elderly | 2,811                                  | 213                                    | 3,024   | <b>16,632</b>           | <b>0.68</b>                                   |
| <b>TOTAL</b>                       | <b>3,304</b>                           | <b>254</b>                             | <b>3,558</b>                                  | <b>19,569</b>           | <b>0.80</b>                                   |

Source: Compiled by the Assessment Team based on government data.

Note: Total household size of 5.5 people is used to approximate the number of people reached.

The social protection top-up payments have played a critical role in reaching the two most vulnerable groups, the elderly and persons with disabilities, who have been identified as severely impacted and immobilized by the disaster. The disaster effects could have been much worse had it not been for the government's coordinated approach to humanitarian assistance and the introduction of the top-up payments.

#### 3.2.4.3 Disaster Impact on Social Protection

While the government currently has two social assistance schemes in place, a wider poverty-targeted social assistance program for the poorest populations has yet to be established. The latest estimates indicate there are 26,000 Tongans living below the poverty line and in need of assistance, particularly following disaster events. There is a pressing need to expand the coverage of social protection in Tonga, and the government has been working to design a cash transfer program that is conditional on children's being admitted to and attending secondary school. The program will also see the development of a registry of poor households.

The 2016 census estimates that the rate of disability in Tonga is 10.6 percent of the total population (Tonga Statistics Department 2017). While the DWS considers cases of extreme disability only, it is estimated that the program currently covers only 8.3 percent of the total cases of disability within the country<sup>14</sup>. Given the disabled population's high vulnerability to disasters, there is a need to expand the coverage of the DWS and increase the number of beneficiaries under from the program.

Tonga has a sizeable youth population, which generally faces poor labor market outcomes. Over half (56 percent) of the country's population is aged 24 years or younger, with a total of about 19,200 Tongans between the ages of 15 and 24. The majority of these youth (76 percent) reside on the main island of Tongatapu, and only 25 percent live in what could be classified as urban areas (i.e., Greater Nuku'alofa). A large proportion of youth fail to transition into employment. There is a need to engage these individuals in meaningful employment and skill-building activities to assist with disaster recovery. With a significant number of homes damaged or destroyed due to TC Gita, there is an opportunity to introduce cash-for-work or public works programs that utilize this available pool of unemployed youth for the reconstruction of homes (discussed further in Section 4.2.1 of this report).

#### 3.2.5 RECOVERY STRATEGY AND NEEDS

The total funds needed to recover from the social impacts of TC Gita are estimated at T\$23.2 million, of which T\$5.2 million is needed for immediate recovery (Table 9), T\$2.5 million for short-term recovery (Table 10), and T\$15.5 million for medium-term recovery (Table 11).

14. This means DSW covers 8.3% of the total 10.6% disabled population.

**TABLE 9. Immediate Recovery Needs in the Social Protection Sector**

| SUBSECTOR         | PROGRAM OF ACTIVITY  | VALUE (T\$)          | RESPONSIBLE AGENCY   |
|-------------------|--|----------------------|--|
| Employment        | Institutional strengthening for preparedness and resilience for private sector and related government and workers' institutions, including microenterprise   | 200,000              | TCCI, MCCTIL, PSA, Skills Tonga                                      |
|                   | Response to skills demand in the construction sector through recognized qualifications and competencies (includes transport sector workers)  | 430,000              | TCCI, MCCTIL, MOET, MIA, Skills Tonga                                |
| Gender            | Gender recovery initiatives, including training for handicrafts, agriculture, and microfinance and learning exchange to diversify livelihood options for women whose livelihoods have been impacted by TC Gita | 290,000              | MIA, Langafonua, MAFFF, Skills Tonga, Tonga Chamber of Commerce, MOI |
|                   | Promotion of awareness on GBV issues (media, audio, workshops, leaflets, posters, brochures) and provision of counseling services for women impacted by TC Gita  | 105,000              | MIA, MOI, Tongan National Centre for Women and Children (TNCWC)      |
|                   | Assessment of and recommendation on safety measures in evacuation centers (to ensure the safety of women—especially pregnant, lactating, disabled, or elderly women—and children)                              | 80,000               | MIA, MOI   |
| Social Protection | Provision of psychological support training sessions for disabled persons  | 20,000               | MIA and DPOs   |
|                   | Partnership and coordination consultations with the private sectors to facilitate vendors to support purchasing power of cash assistance beneficiaries   | 100,000              | MIA and National Retirement Fund Board                               |
|                   | Provision for basic livelihoods such as food packages including, water, food, disability technical devices etc.  |                      |  |
|                   | Cash assistance top ups on existing government benefit schemes to Disability Welfare and Social Welfare Schemes benefit  | 4,000,000            | MIA and National Retirement Fund Board                               |
| <b>TOTAL</b>      |  | <b>5.225 MILLION</b> |  |

Note: GBV = gender-based violence; MAFFF = Ministry of Agriculture, Food, Forests, and Fisheries; MIA = Ministry of Internal Affairs; MOET = Ministry of Education and Training; MOI = Ministry of Infrastructure; MCCTIL = Ministry of Commerce, Consumer, Trade, Innovation and Labour; PSA = Public Service Association; TCCI = Tonga Chamber of Commerce and Industry; TNCWC = Tongan National Centre for Women and Children.

Note for Table 10: MEIDECC = Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications; MAFFF = Ministry of Agriculture, Food, Forests, and Fisheries; MIA = Ministry of Internal Affairs; MCCTIL = Ministry of Commerce, Consumer, Trade, Innovation and Labour; MOI = Ministry of Infrastructure; NEMO = National Emergency Management Office; TCCI = Tonga Chamber of Commerce and Industry; TNCWC = Tongan National Centre for Women and Children; TNYC = Tongan National Youth Congress.



**TABLE 10. Short-Term Recovery Needs in the Social Protection Sector**

| SUBSECTOR         | PROGRAM OF ACTIVITY  | VALUE (T\$)   | RESPONSIBLE AGENCY   |
|-------------------|--|---------------|--|
| Employment        | Improving business confidence through access to financial services and value chain efficiency, particularly for microenterprises headed by youth, women, and persons with disabilities in agriculture and handicraft sectors   | 350,000       | TCCI, MCCTIL, MIA, Langanua 'a Fafine Tonga (Handicraft Association), farmers associations, Tongan National Youth Congress (TNYC), Tonga Mental Health & Disability Organisation |
|                   | Promoting employment intensive infrastructure programs (EIIP) to support reconstruction and jobs   | 480,000       | MIA, private contractors, communities, Skills Tonga  |
| Gender            | Gender recovery initiatives to diversify income of women impacted by TC Gita through participation in Women's Handicraft Expo in 'Eua & Tongatapu and Women's regional exchange (knowledge exchange on handicraft making)  | 300,000       | MIA, MAFFF (women's extension), Tourism, Langanua 'a Fafine Tonga, Tonga Chamber of Commerce   |
|                   | Training to facilitate disaster response and preparedness for women impacted by TC Gita (including training in food preservation, farming practices, and budgeting). Training and media campaigns to raise awareness of family responsibilities during emergencies     | 260,000       | MIA, MAFFF, Skills Tonga, Tonga Chamber of Commerce, local experts, MEIDEC, NEMO   |
|                   | Continuing awareness programs and referral system (training of counterparts and relevant stakeholders in primary prevention strategy specifically focused on time of emergency)  | 50,000        | MIA, TNCWC, Women and Children's Crisis Centre, Talitha Project, TNYC  |
|                   | Psychosocial needs assessment for communities of 'Eua and Tongatapu; continued funding of counselor; establishment of a crisis center branch at 'Eua   | 50,000        | MIA, TNCWC   |
|                   | Consideration/implementation of recommendations from the safety assessment of the evacuation centers (Tongatapu and 'Eua)  | 800,000       | MIA and MOI  |
| Social Protection | Development of a Poverty Registry to target assistance to poor and vulnerable households in future disasters (funding already committed through a GoT-World Bank funded project)   | 36,000        | MIA  |
|                   | Expansion of the Disability Welfare Scheme to increase coverage of the exiting beneficiaries by 20 percent   | 160,000       | MIA  |
|                   | Promotion of literacy on climate change and resilience through the social protection programs, including creation of knowledge products suited to the skill set and needs of the poorest population, in particular women, children, the elderly, and disabled persons. | 35,000        | MIA  |
| TOTAL             |  | 2.521 MILLION |  |

**TABLE 11. Medium-Term Recovery Needs in the Social Protection Sector**

| SUBSECTOR         | PROGRAM OF ACTIVITY   | VALUE (T\$)          | RESPONSIBLE AGENCY  |
|-------------------|---|----------------------|---|
| Employment        | Transitioning informal businesses/workers to formality, ensuring social security and employment/disaster protection   | 200,000              | Tonga Retirement Benefits Fund, MCCTIL, PSA   |
|                   | Improving labor market information for disaster preparedness and long-term labor market outcomes  | 150,000              | National Statistics Office, MCCTIL, TCCI, PSA                                       |
| Gender            | Continuing gender recovery initiatives to diversify income of women impacted by TC Gita through participation in women's national and regional exchanges  | 300,000              | MIA, MAFFF (women's extension), Ministry of Tourism, Langafonua Chamber of Commerce |
|                   | Continuing training to facilitate disaster response and preparedness for women impacted by TC Gita (including training in farming practices, budgeting); continuing training and media campaigns to raise awareness of disaster preparedness and family responsibilities during emergencies | 220,000              | MIA, MAFFF, Skills Tonga, Tonga Chamber of Commerce, local experts, MEIDECC, NEMO   |
|                   | Continuing support for counselor and crisis center branch at 'Eua   | 60,000               | MIA, TNCWC  |
| Social Protection | Introduction of a poverty-targeted cash assistance program (for which funding is already committed through a GoT-World Bank– funded project)  | 14 million           | MIA   |
|                   | Development of an emergency policy framework on Cash Transfers in time of Natural disasters to vulnerable populations   | 50,000               | MIA   |
| <b>TOTAL</b>      |   | <b>15.45 MILLION</b> |   |

Note: MAFFF = Ministry of Agriculture, Food, Forests, and Fisheries; MCCTIL = Ministry of Commerce, Consumer, Trade, Innovation and Labour; MEIDECC = Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications; MIA = Ministry of Internal Affairs; NEMO = National Emergency Management Office; PSA = Public Service Association ; TCCI = Tonga Chamber of Commerce and Innovation; TNCWC = Tongan National Centre for Women and Children.











# 4

## **DAMAGE, LOSSES, AND NEEDS**

### **4.1 PRODUCTIVE SECTORS**

**Damage and losses to  
productive sectors totaled  
T \$193.35 million**

#### **4.1.1 AGRICULTURE**

**Damage and losses to the  
agriculture sector totaled  
T \$97.48 million**

##### **4.1.1.1 Summary**

The agriculture sector includes the following four subsectors: crops, livestock, fisheries, and forests. In total, the four subsectors made up 17 percent of 2016 GDP.<sup>15</sup> Crops and livestock constitute 13.7 percent of the sector's contribution to GDP, followed by fisheries (2.9 percent), and forestry (0.4 percent). About 75 percent of Tonga's population lives in rural areas, with agriculture and fisheries as the main source of livelihoods. Tonga has one of the highest rates of subsistence food production among Pacific Island Countries,<sup>16</sup> largely based on traditional production of root crops, which provide food security, employment, and income for many households.

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15. GDP figures for 2016 are from the Ministry of Finance and National Planning.

16. Kingdom of Tonga, "Tonga Agriculture Sector Plan 2016–2020," <http://pafpnet.spc.int/resources/574-tonga-agriculture-sector-plan-2016-2020>.

Of the four subsectors, the crops subsector was the most affected by TC Gita (contributing to 88 percent of total damage and losses for the sector), followed by forestry (7 percent), livestock (3 percent), and fisheries (2 percent). Perennial crops, including trees (fruit trees and handicraft trees such as mulberry and pandanus), kava, and vanilla, were the most impacted by the cyclone, but annual crops, such as cassava, yam, and taro, also suffered significant losses. Damage and losses in the livestock subsector occurred mainly in Vaini district and 'Eua Fo'ou and mostly involved beef cows (32 dead) and dairy cows (four dead) but also included damaged fences. In the forestry subsector, the timber industry was impacted by high winds that damaged infrastructure and trees, mostly in Nukunuku and Tatakamotonga districts. The fisheries subsector was also impacted, with the greatest effect on artisanal fisheries and commercial snapper fishing boats, mostly in Tokofou district.

The total value of damage and production losses in agriculture amounts to T\$97.5 million. Recovery needs should focus on supplying resilient fruit tree and timber seedlings and should support development of food-preservation techniques for fruits and root crops; the goal is to promote a resilient agriculture sector able to withstand future shocks. In the fisheries subsector, training should be provided in techniques to repair boats and fishing gear such as nets and to promote resilience against future shocks (prevention, mitigation, and preparedness techniques). In the livestock subsector, the loss of fruit trees, especially coconuts, had a negative impact on feed availability for livestock, hence the need for provision of feeds.

Reconstruction needs will focus on the short-term infrastructural works (incorporating BBB techniques) and on repair of livestock fences.

#### 4.1.1.2 Agriculture Sector Background

For the four subsectors crops, livestock and forestry are managed by the Ministry of Agriculture, Food, Forests, and Fisheries (MAFFF).

Agricultural land in Tongatapu comprises 42,497 acres, which is 64 percent of the total agricultural land in Tonga. 'Eua comprises 4,981 acres of agricultural land, which is 8 percent of the country's total (Figure 5). About 86 percent of households and organizations in Tonga are agriculturally active. About 71 percent of these are based in Tongatapu, and about 4 percent are in 'Eua. Of the agriculturally active workforce, 34 percent are employed in agriculture, forestry, and fishing, and women comprise about 14 percent of those employed in the sector (MAFFF, TSD, and FAO 2015). Agriculture continues to be the predominant economic activity in Tonga, although its relative importance has dwindled in recent years.<sup>17</sup> The main purpose of household engagement in agriculture continues to be subsistence and semi-subsistence.

Overall, about 5 percent of the agriculturally active households engage in commercial agricultural activities, while 95 percent are still engaged in subsistence and semi-subsistence agricultural activities. Crop cultivation and raising of livestock continue to be the main agriculture activities in Tonga. Handicraft activity has also become a major agricultural activity, particularly in rural areas and the outer islands. Export of handicrafts in FY2014/15 accounted for as much as T\$4 million (MAFFF, TSD, and FAO 2015).

Agriculture exports have steadily increased since FY2009/10, when about 90 percent of the country's exports consisted of agricultural and fishery products, with a value estimated at T\$14 million. The growth in total agricultural exports is due to an increase in exports of non-squash commodities, particularly root crops, coconuts, watermelons, and kava. Squash exports declined by 12 percent in FY2013/14, reflecting the withdrawal of a major exporter from the market (MAFFF, TSD, and FAO 2015).

Fish dominated Tonga's exports in FY2013/14, accounting for 22 percent of domestic exports, followed by crustaceans and other aquatic invertebrates (20 percent), root crops (18 percent), kava (9 percent), and squash pumpkins (7 percent). Together, these products made up 76 percent of all of Tonga's domestic exports. Exports of tuna, which constitute 40 percent of fisheries exports, more than doubled in the first half of FY2014/15.

**Crops and livestock.** Crops and livestock represent an average of 13.7 percent of total agricultural GDP. A total of 10,296 households were engaged in crop cultivation during 2015, while 12,859 households engaged in livestock rearing.

Dominant subsistence crops include cassava (manioke); this was the largest annual crop cultivated in 2015, occupying 10,207 acres (18 percent of the total cultivated land area). Other crops include yam (ufi) (5,315 acres); yautia (talo futuna) (2,565 acres); sweet potato (kumala) (1,901 acres); and swamp taro (talo Tonga) (1,627 acres). The largest perennial crops cultivated during 2015 were kava (1,257 acres), mulberry (757 acres), and vanilla (632 acres). A significant number of farming households derive income from taro, cassava, and kava. Pigs continued to be the dominant type of livestock raised during 2015. The number of cattle in 2015 was 18,762, an increase of 81 percent over the 2001 total of 10,354.

17. FAOSTAT, "Tonga," <http://www.fao.org/faostat/en/#country/219>.



## Fisheries

Fisheries represented an average of 2.9 percent of total agricultural GDP in 2016. In 2015, a total of 2,360 households in Tonga were engaged in fishing activities, mainly focused on reef finfish and tuna and to a lesser extent on shellfish, lobster, and sea cucumber. The Tongatapu and Vava'u regions had the largest number of households involved in fishing.

## Forestry

Forestry represented an average of 0.4 percent of total agricultural GDP. In 2015, a total of 2,469 households were engaged in forestry activity across the country. Most of the forest trees grown are for building purposes, although sandalwood trees are grown for their high market value.

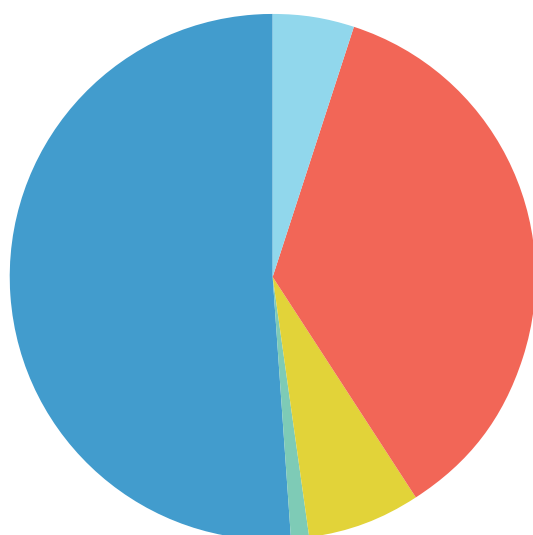
A total of 344 households, or 14 percent of households involved in forestry, engaged in forestry mainly for commercial purposes. About 64 percent of the commercial forestry households lived in the Vava'u region and were not impacted by TC Gita. 'Eua and Tongatapu also have some commercial forestry households.

### 4.1.1.3 Assessment of Disaster Effects on the Agriculture Sector

Damage to assets and production losses were assessed and estimated for the four agricultural subsectors. The total effects of TC Gita on crops, livestock, fisheries, and forestry is T\$97.47 million, of which T\$5.07 million is attributable to damage and T\$92.4 million is attributable to loss (Table 12, Figure 6). Table 13 shows the breakdown of damage and loss by districts.

**FIGURE 5.**

Agricultural Land Use in Tonga (2015)

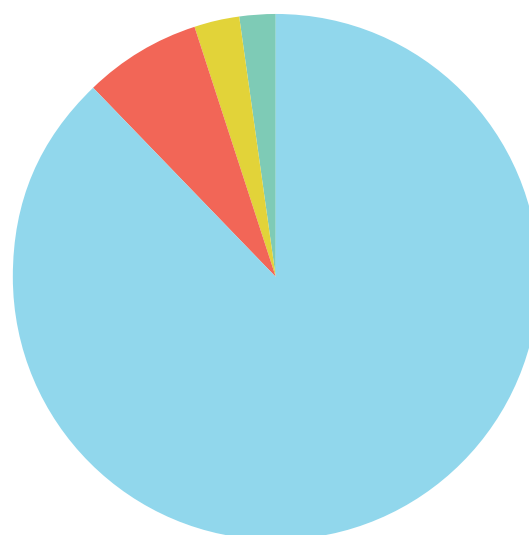


|                 |     |
|-----------------|-----|
| Perennial crops | 5%  |
| Annual crops    | 36% |
| Pasture         | 7%  |
| Livestock       | 1%  |
| Fallow          | 51% |

Source: MAFF, TSD, and FAO 2015.

**FIGURE 6.**

Share of Damage and Loss between Agriculture Subsectors



|             |     |
|-------------|-----|
| Agriculture | 88% |
| Forestry    | 7%  |
| Livestock   | 3%  |
| Fishery     | 2%  |

Source: MAFF, TSD, and FAO 2015.

**TABLE 12. Damage and Losses in the Agriculture Sector by Subsector (T\$ millions)**

|                            | DAMAGE      |             | LOSSES       |             |
|----------------------------|-------------|-------------|--------------|-------------|
|                            | Private     | Public      | Private      | Public      |
| <b>Crops</b>               | <b>0.25</b> | <b>0.33</b> | <b>85.40</b> | <b>0.00</b> |
| Crops                      | 0.00        | 0.00        | 32.28        | 0.00        |
| Fruit trees                | 0.25        | 0.00        | 47.16        | 0.00        |
| Cash crops (kava, vanilla) | 0.00        | 0.00        | 5.96         | 0.00        |
| Infrastructure             | 0.00        | 0.33        | 0.00         | 0.00        |
| <b>Forestry</b>            | <b>0.00</b> | <b>0.05</b> | <b>6.69</b>  | <b>0.00</b> |
| Handicraft/medicine        | 0.00        | 0.00        | 6.16         | 0.00        |
| Infrastructure             | 0.00        | 0.05        | 0.00         | 0.00        |
| Timber                     | 0.00        | 0.00        | 0.52         | 0.00        |
| <b>Livestock</b>           | <b>3.11</b> | <b>0.01</b> | <b>0.05</b>  | <b>0.00</b> |
| Animals                    | 3.11        | 0.00        | 0.05         | 0.00        |
| Infrastructure             | 0.00        | 0.01        | 0.00         | 0.00        |
| Fences                     | 0.00        | 0.00        | 0.00         | 0.00        |
| <b>Fishery</b>             | <b>1.24</b> | <b>0.10</b> | <b>0.25</b>  | <b>0.00</b> |
| Small-scale                | 0.57        | 0.00        | 0.00         | 0.00        |
| Snapper vessels            | 0.45        | 0.00        | 0.25         | 0.00        |
| Pearl farms                | 0.22        | 0.07        | 0.00         | 0.00        |
| Infrastructure             | 0.00        | 0.03        | 0.00         | 0.00        |
| <b>TOTAL</b>               | <b>4.60</b> | <b>0.50</b> | <b>92.38</b> | <b>0.00</b> |

Source: Estimations based on assessments by MAFFF and MORDI (Mainstreaming of Rural Development Innovation) Tonga.

**TABLE 13. Damage and Losses to the Agriculture Sector by Districts (T\$ millions)**

| DISTRICT                   | DAMAGE      | LOSSES       | TOTAL EFFECT | PRIVATE      | PUBLIC      |
|----------------------------|-------------|--------------|--------------|--------------|-------------|
| <b>Tongatapu districts</b> |             |              |              |              |             |
| Kolomotuá                  | 0.16        | 5.61         | 5.77         | 5.77         | 0.00        |
| Kolovai                    | 0.11        | 9.54         | 9.65         | 9.65         | 0.00        |
| Lapaha                     | 0.75        | 11.62        | 12.38        | 12.38        | 0.00        |
| Nukunuku                   | 0.39        | 21.72        | 22.10        | 22.10        | 0.00        |
| <b>Tatakamotonga</b>       | <b>1.70</b> | <b>13.45</b> | <b>15.15</b> | <b>15.15</b> | <b>0.00</b> |
| Vaini                      | 0.93        | 21.75        | 22.68        | 22.68        | 0.00        |
| Kolofo'ou                  | 1.03        | 0.42         | 1.46         | 0.99         | 0.47        |
| Total Tongatapu            | 5.07        | 84.11        | 89.18        | 88.71        | 0.47        |
| <b>'Eua districts</b>      |             |              |              |              |             |
| 'Eua Fo'ou                 | 0.02        | 2.96         | 2.98         | 2.98         | 0.00        |
| 'Eua Motu'a                | 0.01        | 5.31         | 5.32         | 5.32         | 0.00        |
| Total 'Eua                 | 0.03        | 8.27         | 8.30         | 8.30         | 0.00        |
| <b>TOTAL</b>               | <b>5.10</b> | <b>92.38</b> | <b>97.48</b> | <b>97.01</b> | <b>0.47</b> |

Source: Estimations based on assessments by MAFFF and MORDI (Mainstreaming of Rural Development Innovation) Tonga.



## Damage

**Crops.** The total value of damage in the crops subsector was estimated at T\$0.58 million, representing 11 percent of the total damage to the agriculture sector. Most of the damage involved the total or partial destruction of public buildings and damage to permanent crops such as coconut, mango, and breadfruit. Most of the damage in the crops subsector occurred in Kolofo’ou district and Vaini district.

**Livestock.** The estimated value of damage to the livestock subsector was T\$3.2 million, which represents around 61 percent of total damage to the sector. The cyclone damaged fences and killed livestock (beef cows and dairy cows). Most of the damage occurred in the Vaini district, followed by ‘Eua Fo’ou (for animals) and Tatakamotonga for (fencing).

**Fisheries.** Damage to the fisheries subsector was valued at over T\$1.3 million, representing 26 percent of total damage to the agriculture sector. The damage assessment covered main fisheries assets, including boats, engines, fishing gear, and fish fences, as well as pearl, clam, and seaweed farms and hatcheries. The most significantly affected assets included snapper boats, assets belonging to subsistence fishermen, and fishery infrastructure, including the main fish market.

**Forestry.** The estimated value of damage to the forestry subsector totaled T\$0.05 million. Damaged assets included forestry buildings, mature trees in plantations, and native forests, with significant damage to pine, mulberry, pandanus, and mahogany trees.

## Losses

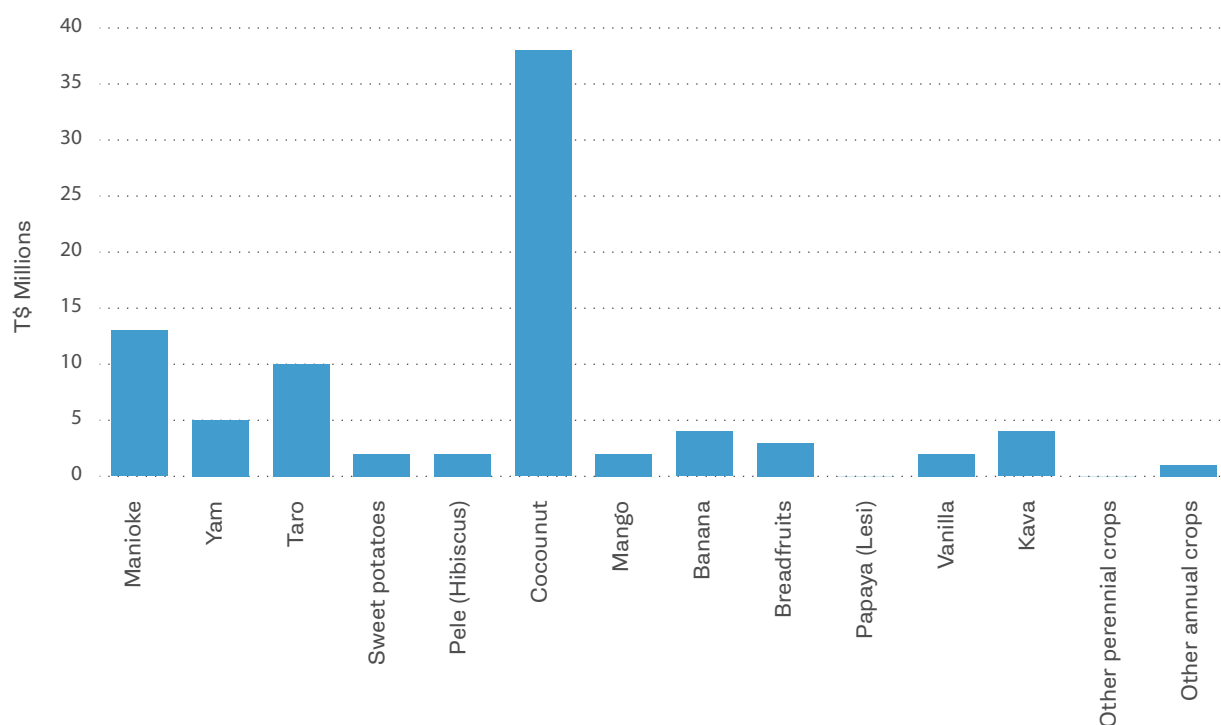
**Crops.** Estimated production losses in the crops subsector were T\$85.4 million. The cyclone caused significant losses to fruit trees (coconut, breadfruit, mango), root crops (cassava, yam, taro), and cash crops (kava, vanilla). Most of the production losses affected coconut trees (44 percent), followed by cassava (15 percent) and taro (11 percent). Losses in banana, mango, hibiscus, breadfruit, sweet potato, vanilla, and kava accounted for 21 percent of total losses (Figure 7).

**Livestock.** Estimated losses to the livestock subsector were T\$0.05 million. These include production losses due to the death of 36 animals and to a decline in milk production.

**Fisheries.** The fisheries subsector sustained production losses of over T\$0.25 million. These were the result of damage to fisheries assets, mostly from commercial snapper boats.

**FIGURE 7.**

Losses in the Crops Subsector (T\$ millions)



Source: MAFFF, TSD, and FAO 2015.

**Forestry.** Estimated production losses to the forestry subsector totaled T\$6.7 million. High-value trees such as mulberry and pandanus trees accounted for a substantial portion of total losses (89 percent), while timber trees (pine, mahogany) accounted for the remainder (11 percent). Nukunuku and Tatakamotonga districts were the most affected.

#### **4.1.1.4 Recovery Strategy and Needs for the Agriculture Sector**

The total value of recovery and reconstruction needs for the agriculture sector is estimated at T\$8.82 million, of which T\$3.72 million is required for recovery and T\$5.11 million is required for reconstruction.

The proposed recovery actions aim to maintain and strengthen inclusion; they seek to incorporate and ensure the participation of clearly identified vulnerable groups, with a focus on gender and age where necessary. Nutrition and food security concerns are considered through the short and medium term.

The recovery and reconstruction efforts in the agriculture sector aim to support the reestablishment of food security sources in affected communities, revive economic activity across the sector, and strengthen farmers' capacity to be more resilient to similar future shocks in accordance with the principles of BBB. The proposed recovery programs specifically focus on facilitating access to good-quality agricultural tree seedlings, supporting food preservation techniques, and supporting repair to livestock fencing, boats, and fishing gear. Reconstruction will be focused on rehabilitating damaged infrastructure such as administration buildings.

The government instituted recovery programs immediately after the cyclone in collaboration with the food security and livelihood cluster (which includes NGOs and UN agencies). Post-cyclone recovery and reconstruction needs have been identified for the immediate term (Table 14), the short term (Table 15), and the medium term (Table 16). Immediate recovery and reconstruction activities should target the most affected population within government priority areas, irrespective of gender or age. There is also a medium-term need to improve disaster preparedness by developing solid baseline data, as well as post-disaster assessment, communications, and monitoring and evaluation tools.

**Crops and livestock.** In the crops and livestock subsectors, immediate-term activities will address immediate food security needs by restoring crops and livestock production through land clearance, distribution of agro-inputs (seeds, seedlings, suckers, cuttings, and fertilizers), and provision of feeds and fodder. Support is also needed for preparing land, clearing existing drainage systems, and rehabilitating critical transport and infrastructure, such as pasture fencing.

In the short term, further resources will be required for restoring the crop and livestock economy by supporting the replanting of trees, introducing new varieties (such as guava, citrus trees), promoting use of modern technology where possible, and promoting climate-smart and resilient farming techniques and systems. Although the immediate impact of the cyclone on livestock was minimal, many animals are suffering from a lack of feed due to the loss of fruit trees such as coconut. Intervention will be needed to ensure sufficient feed is available.

**Forestry.** For the forestry subsector, the immediate-term focus will primarily be on clearing and salvaging fallen trees from plantations. This will require acquiring and mobilizing new portable sawmills to support the salvaging process and providing training in their use. Strengthening of nurseries will be required so that replanting programs can operate smoothly from the short term onward. In the short term, the main focus will be on reforestation of plantations, mostly by providing mulberry seedlings as well as pine and mahogany.

**Fisheries.** In the fisheries subsector, the main priority for immediate-term needs is distribution of fishing equipment kits to both licensed and nonlicensed fisheries enterprises. Resources are required to repair boats and engines and to replace missing equipment. Short-term needs involve support for training to help fishermen repair damaged assets, including boats; funding for repair of fishing infrastructure; and support for training in prevention, mitigation, and preparedness techniques. There is also a short-term need to improve disaster preparedness by developing solid baseline data, as well as post-disaster assessment, communications, and monitoring and evaluation tools.

**TABLE 14. Immediate-Term Recovery Needs in the Agriculture Sector**

| SUBSECTOR    | PROGRAM OF ACTIVITY   | VALUE<br>(T\$ MILLIONS) | RESPONSIBLE<br>AGENCY        |
|--------------|---|-------------------------|------------------------------|
| Crops        | Immediate response from food security and livelihood cluster, including provision of plowing, fast-growing planting materials (cassava, pele, corn, sweet potatoes), and other agricultural inputs for replanting of crops; land clearance support, including chainsaws | 0.59                    | Food security cluster, MAFFF |
| Livestock    | Immediate response from food security and livelihood cluster, including chick distribution  | 0.17                    | MAFFF                        |
| Forestry     | Immediate response from food security and livelihood cluster, including logging   | 0.23                    | MAFFF                        |
| <b>TOTAL</b> |   | <b>0.99</b>             |                              |

Photo: Malani Wolfgramm/World Bank. Yam crop, 'Utulau Village, Tongatapu.





**TABLE 15. Short-Term Recovery Needs in the Agriculture Sector**

| SUBSECTOR    | PROGRAM OF ACTIVITY  | VALUE<br>(T\$ MILLIONS) | RESPONSIBLE<br>AGENCY                             |
|--------------|--|-------------------------|---|
| Crops        | Provision of improved varieties of seeds/seedlings for fruit trees (coconut, mango, guava, citrus, other new exportable varieties); expansion of existing and establishment of new nursery capacity; increased support to development of cyclone-resilient crops | 0.80                    | Food security and livelihood cluster, MAFFF, NGOs |
|              | Support for development and dissemination of food-preservation techniques (traditional and new technologies)   | 0.20                    | MAFFF, NGOs                                       |
|              | Technical assistance for finalizing baseline and assessment tools, including provision of tablets for assessment surveys (10 tablets)  | 0.02                    | Food security and livelihood cluster, MAFFF       |
| Livestock    | Distribution of veterinary drugs, feeds  | 1.29                    | MAFFF   |
| Forestry     | Supply of mulberry and timber seedlings (along with pine, mahogany)  | 0.15                    | MAFFF   |
| Fisheries    | Technical assistance for finalizing baseline and assessment tools, including provision of tablets for assessment surveys (10 tablets)  | 0.02                    | MAFFF   |
|              | Training in boat, motor, and fishing gear repair and sustainable fishing practices; training in prevention, mitigation, and preparedness techniques  | 0.25                    | MAFFF, technical assistance                       |
| <b>TOTAL</b> |  | <b>2.73</b>             |   |



Photo: Malani Wolfgramm/World Bank. Damaged business, Tongatapu.

**TABLE 16.** Medium-Term Recovery Needs in the Agriculture Sector

| SUBSECTOR    | PROGRAM OF ACTIVITY   | VALUE<br>(T\$ MILLIONS) | RESPONSIBLE<br>AGENCY |
|--------------|---|-------------------------|-----------------------|
| Crop         | Repair of damaged infrastructure                            | 0.38                    | MAFFF                 |
| Livestock    | Restocking; repair of fences and buildings                  | 3.12                    | MAFFF                 |
| Forestry     | Repair of damaged infrastructure                            | 0.06                    | MAFFF                 |
| Fisheries    | Repair of damaged infrastructure, boats, and fishing assets | 1.54                    | MAFFF                 |
| <b>TOTAL</b> |   | <b>5.11</b>             |                       |

## 4.1.2 COMMERCE AND INDUSTRY

### Damage and losses to commerce and industry totaled T \$55.27 million

#### 4.1.2.1 Summary

Tongan businesses face the challenges typical of small island economies, including geographic isolation, limited human and financial resources, a small domestic market, and high cost of doing business. The Assessment Team identified approximately 3,000 business establishments in Tongatapu and 'Eua that could be included in the commerce sector assessment.<sup>18</sup>

Based on a survey conducted among a sample of businesses in the affected communities of Tongatapu and 'Eua, it was found that a small number of establishments—around 3 percent—reported complete destruction of their properties, while most businesses—around 60 percent—reported partial damage to their properties. Around 15 percent of businesses reported damage to their assets.

The value of the damage to physical infrastructure and assets in the commerce and industry sector was estimated as T\$23.5 million. This entire amount was ascribed to the private sector, as no government-owned enterprises were identified. The effects of TC Gita on state-owned enterprises were captured in the assessment of the sectors in which they were located.

The losses in the sector were estimated at T\$31.8 million, which represents the revenue loss from the time of the event until such time as operations return to pre-disaster levels. Businesses surveyed reported that it could take anywhere between two weeks and four to six months for them to reach their pre-disaster performance levels. Issues affecting performance ranged from disruption of access to public utilities (such as water, telecommunications, and electricity), to slow consumer demand, challenges in securing goods for sale, and difficulty in securing necessary inputs for production or processing enterprises.

Losses to the sector accounted for 58 percent of the overall effect (T\$55.3 million) to the sector and represented approximately 23 percent more than the damage. The commerce subsector (which comprises retail and wholesale trade) accounted for 68 percent of all damage and 73 percent of loss within the sector. These losses are significant, as small and micro entrepreneurs make up the largest share of the sector and may be among the groups with the lowest insurance coverage.

The costs of reconstruction are expected to be borne mainly by the private sector, where some 30 percent have insurance coverage.

The cost of recovery was estimated at T\$12.8 million.

#### 4.1.2.2 Commerce and Industry Sector Background

An analysis of the economy of Tonga for the period 2012–2015 found positive growth and identified the rebuilding program in the center of Nuku'alofa as a key influence on that growth. The services sector (including commerce, which is mostly trade, as well as tourism, public services, and finance) comprises 60 percent of GDP, compared to the primary sector (agriculture, forestry, and fishing) comprising 19 percent, and industry (construction and manufacturing) comprising 21 percent.

Tonga's small financial system consists of four banks, namely the Tonga Development Bank, MBF Bank, ANZ Bank, and BSP Bank. The financial sector is regulated and supervised by the National Reserve Bank of Tonga. ANZ and BSP dominate the market for deposits, loans, and medium to large business clientele. MBF Bank (Malaysian) focuses on personal loans and does not have a business loan portfolio. The Tonga Development Bank operates on a commercial basis and is willing to expand its business lending portfolio. The bank has moderately developed systems, processes, and policies to handle commercial and SME (small and medium enterprise) lending, and there is scope for further capacity building. Banks are willing to consider cash flow–based lending but would require assistance in developing the capacity to make such loans. The nonperforming loan level is low in Tonga. There is also a good level of liquidity in the system. The regional microfinance institution—the South Pacific Business Development (SPBD) network—started operations in Tonga a few years ago and has received a very good response.

18. The large number of businesses in the areas affected by TC Gita, along with limited data on business type and size, made assessment of damage and losses in this sector especially complex. See annex 2 for assumptions and limitations of the analysis.”



**TABLE 17. Business Licenses Issued in ‘Eua and Tongatapu, 2018**

| MCCTIL REGISTRY, MARCH 2018 | ‘EUA       | TONGATAPU    |
|-----------------------------|------------|--------------|
| Services                    | 46         | 1,121        |
| Entertainment /Catering     | 3          | 100          |
| Therapeutic Goods Sales     | 0          | 10           |
| Retail                      | 30         | 640          |
| Professional Services       | 0          | 128          |
| Financial Institution       | 0          | 10           |
| Flammable Goods Sales       | 0          | 21           |
| Distribution                | 2          | 151          |
| Manufacturing/Processing    | 4          | 108          |
| Telecommunications          | 0          | 11           |
| Transportation (non-taxi)   | 3          | 66           |
| Tourism                     | 3          | 228          |
| Agriculture                 | 1          | 15           |
| Information Technology      | 0          | 32           |
| Taxi Services               | 0          | 78           |
| Construction                | 3          | 101          |
| Fisheries                   | 0          | 18           |
| Liquor Sales                | 2          | 55           |
| Recycling Services          | 0          | 3            |
| Export                      | 5          | 161          |
| Import                      | 7          | 446          |
| Other                       | 1          | 207          |
| <b>TOTAL</b>                | <b>110</b> | <b>3,710</b> |

Source: Estimates based on MCCTIL data.

**TABLE 18.****Tax-Paying Businesses in 'Eua and Tongatapu, 2018**

| TYPE OF TAX        | 'EUA      | TONGATAPU    |
|--------------------|-----------|--------------|
| Small Business Tax | 78        | 1,608        |
| Income Tax (Small) | 4         | 433          |
| Income Tax (Large) | 4         | 553          |
| <b>TOTAL</b>       | <b>86</b> | <b>2,594</b> |

Source: Ministry of Revenue and Customs Taxation Division, March 2018.

Tongan businesses face the challenges typical of small island economies, including geographic isolation, limited human and financial resources, a small domestic market, and high cost of doing business. Businesses have been vulnerable to three layers of internal and external shocks: (i) natural disasters have severely impacted the local economy and businesses in the past, (ii) the last global financial crisis adversely impacted diaspora remittances and thus flow of capital for local businesses, and (iii) the import-based economy is susceptible to external price shocks, which affect input prices for local businesses. Businesses view limited access to finance as a major impediment to business growth. Bank lending is mostly against land collateral, and the private sector is constrained by complex land tenure in the country. Loan interest rates are moderate at 7–12 percent. However, this is considered very high by the business community, mainly due to the wrong price signals given by the government-subsidized lending program (with interest rates of 1–4 percent).

According to the Ministry of Commerce, Consumer, Trade, Innovation and Labour (MCCTIL) registry, a total of 5,153 business licenses were issued in 2018; 2,576 were in Tongatapu and 99 were in 'Eua (see Table 17). To supplement the information in the MCCTIL registry, information was sought from the Ministry of Revenue and Customs Taxation Division on tax-paying businesses in both Tongatapu and 'Eua. Table 18 presents the breakdown of tax-paying businesses by size.

From an examination of both listings presented, the Assessment Team identified some 3,000 businesses that belonged to the commercial sector and formed part of the assessment. Businesses excluded were those involved in tourism (including entertainment and catering), construction, telecommunications, and recycling services, as it was expected that these would be included in the other sector reports.

After excluding businesses that would be included as part of other sectors, the remaining businesses were further categorized into four broad areas for ease of analysis. Figure 8 presents the distribution of the businesses by type. It shows that businesses categorized as commercial (predominantly retail and wholesale) comprised 74 percent of businesses, those described as cottage industries (predominantly home-based handicrafts) comprised 13 percent, and those within manufacturing and processing comprised 8 percent and 5 percent, respectively.

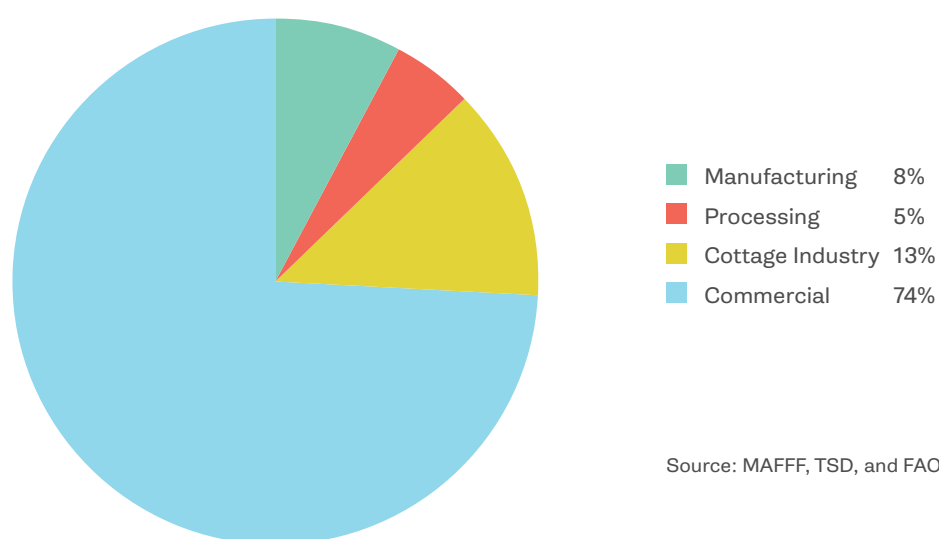
An analysis of the businesses by size suggests that most (88 percent) were small (with one to four employees) or microenterprises (five to eight employees).

Insurance coverage was found to be significant among the business, as approximately 30 percent of businesses surveyed reported some form of insurance coverage.

According to the 2015/16 HIES, the private sector, including the commercial sector, employs 18 percent of the population 15 years and over; 33 percent of households are involved in cottage industries, producing handicrafts or home-processed foods (Kingdom of Tonga 2017).

**FIGURE 8.**

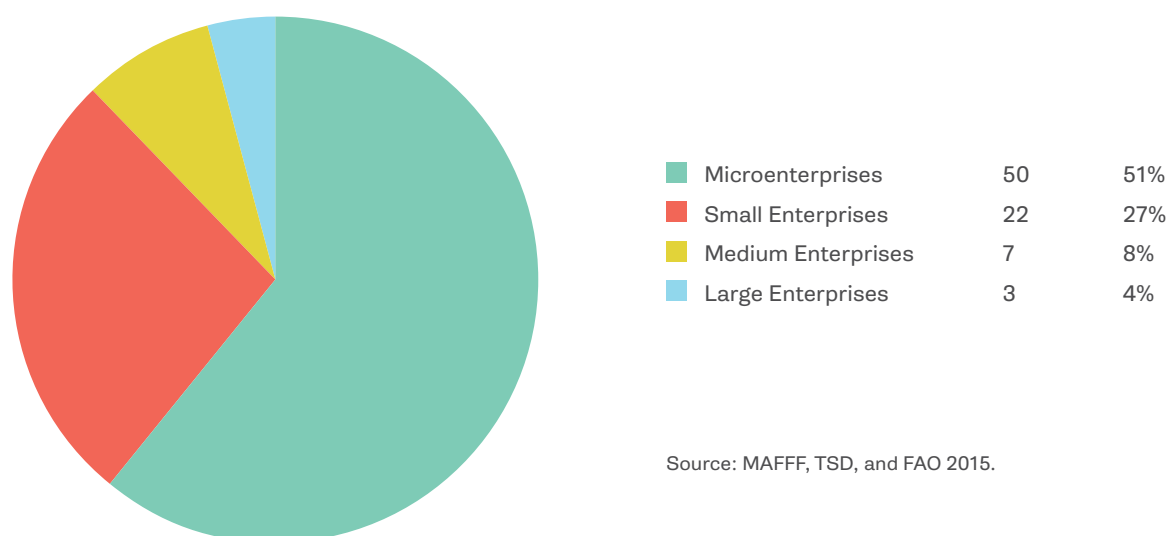
**Distribution of Business by Type**



Source: MAFF, TSD, and FAO 2015.

**FIGURE 9.**

**Distribution of Business by Size**



Source: MAFF, TSD, and FAO 2015.



With technical assistance from the International Labour Organization, MCCTIL conducted a rapid livelihoods survey from March 12 to March 15, 2018. The goal was to analyze the impact of TC Gita on persons involved in the production of handicrafts and those in the taxi business. The survey found that own-account workers were primarily women, whereas employers and casual employees were mainly men. Similarly, the handicraft industry could be described as a female enterprise, due to the high proportion of women in the industry, while the taxi business was predominantly male.

#### 4.1.2.3 Assessment of Disaster Effects on Commerce and Industry

The Assessment Team found that a small number of businesses (estimated at 3 percent) reported complete destruction of properties, while most business (around 60 percent) reported partial damage to their properties. Around 15 percent reported damage to their assets, including equipment and machinery and stocks of goods or existing inventory. Taxi business operators did not report damage to their vehicles.

##### Damage

The value of the damage to physical infrastructure and assets in the commerce and industry sector was estimated as T\$23.5 million. The entire amount was ascribed to the private sector, as no government-owned enterprises were identified.

##### Losses

Losses in the sector were estimated at T\$31.8 million. Businesses surveyed reported that it could take anywhere between two weeks and four to six months for them to reach their pre-disaster performance levels. Issues affecting performance ranged from disruption of access to public utilities (such as water, telecommunications, and electricity), to slow consumer demand, challenges in securing goods for sale, and difficulty in securing necessary inputs for production or processing enterprises.

Taxi operators reported losing approximately three working days following TC Gita, and were also affected by slow consumer demand, which reduced their income by approximately 57 percent of regular earnings.

#### Summary of Effects

Table 19 presents the value of damage and loss by business type of business and shows the total effects to the commerce and industry sector. Losses to the sector accounted for 58 percent of the overall effect to the sector, and were approximately 23 percent more than the value of the damage. The commerce subsector (which comprises retail and wholesale trade) accounted for 68 percent of all damage and 73 percent of loss. These losses are significant, as small and micro entrepreneurs make up the largest share of the sector and may be among the groups with the lowest insurance coverage.

#### 4.1.2.4 Recovery Strategy and Needs for the Commerce and Industry Sector

The recovery strategy seeks to support actors in the commerce sector in re-establishing their businesses so that they perform better than they did prior to TC Gita; the goal is for them to rebuild with resilience to future events—that is, build back better. The cost of recovery has been estimated at T\$12.8 million.

To promote resilient recovery, more businesses should be encouraged to insure their structures and assets (equipment and machinery) and reduce further risk by ensuring that their properties are retrofitted and constructed according to the national building codes.

Female business owners who operate in the handicrafts sector will primarily need support to rehabilitate their microenterprises. More than 80 percent of handicraft producers reported the need for access to financial services; a smaller share reported needing access to raw material for the repair of their buildings. Other needed support includes seedlings for replanting<sup>19</sup> and a quick replacement of lost raw material.

Other small business operators reported recovery priorities that included lifting the curfew around the central business area in Nuku'alofa, which they said was harming their operations

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19. This need has been addressed by the agriculture sector.

**TABLE 19. Summary of Total Effects (T\$)**

| Business Type    | Damage            | Losses            | Total Effects     |
|------------------|-------------------|-------------------|-------------------|
| Manufacturing    | 1,043,757         | 1,136,874         | 2,180,631         |
| Processing       | 6,476,390         | 6,883,287         | 13,359,676        |
| Cottage Industry | 51,334            | 381,379           | 432,713           |
| Commerce         | 15,903,833        | 23,387,091        | 39,290,924        |
| <b>SUBTOTAL</b>  | <b>23,475,314</b> | <b>31,788,631</b> | <b>55,263,944</b> |

Source: Estimates based on survey data.

Note: All damage shown is in the private sector; no state-owned enterprises were identified in the assessment.

**TABLE 20. Immediate Needs in the Commerce and Industry Sector**

| PROGRAM OF ACTIVITY  | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY |
|--|----------------------|--------------------|
| Tax exemption for inputs and materials necessary for rebuilding (specifically construction materials for rebuilding businesses affected by TC Gita)  | 2.5                  |                    |
| Establishment/strengthening of a new microfinance facility for businesses affected by TC Gita, with a special funding line to rebuild/recommence operations following TC Gita (including a special window to meet the needs of women handicraft producers)   | 1.5                  |                    |
| Capacity building of affected businesses to ensure viable regrowth   | 0.2                  |                    |
| Introduction of new disaster resilience products, such as (i) instruments to improve business insurance coverage, (ii) initiatives to reduce business costs (i.e., for fuel, telecommunications, Internet, etc.), and (iii) capacity building for financial institutions in business loan processes and policies aligned to risks of business in Tonga | 0.05                 |                    |
| Preparation of local suppliers to meet relief needs in the case of future events (special campaigns/workshops)   | 0.05                 |                    |
| <b>TOTAL</b>   | <b>4.3</b>           |                    |







**TABLE 21. Short-Term Needs in the Commerce and Industry Sector**

| PROGRAM OF ACTIVITY  | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY |
|--|----------------------|--------------------|
| Tax exemption for inputs and materials necessary for rebuilding (specifically construction materials for rebuilding businesses affected by TC Gita)  | 1.5                  |                    |
| Establishment/strengthening of a new microfinance facility for businesses affected by TC Gita, with a special funding line to rebuild/recommence operations following TC Gita (including a special window to meet the needs of women handicraft producers)   | 5.0                  |                    |
| Capacity building of affected businesses to ensure viable regrowth   | 0.3                  |                    |
| Introduction of new disaster resilience products, such as (i) instruments to improve business insurance coverage, (ii) initiatives to reduce business costs (i.e., for fuel, telecommunications, Internet, etc.), and (iii) capacity building for financial institutions in business loan processes and policies aligned to risks of business in Tonga | 0.1                  |                    |
| Preparation of local suppliers to meet relief needs in the case of future events (special campaigns/workshops)   | 0.1                  |                    |
| <b>TOTAL</b>   | <b>7.0</b>           |                    |

**TABLE 22. Medium-Term Needs in the Commerce and Industry Sector**

| PROGRAM OF ACTIVITY  | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY |
|--|----------------------|--------------------|
| Establishment/strengthening of a new microfinance facility for businesses affected by TC Gita, with a special funding line to rebuild/recommence operations following TC Gita (including a special window to meet the needs of women handicraft producers)   | 1.0                  |                    |
| Capacity building of affected businesses to ensure viable regrowth   | 0.3                  |                    |
| Introduction of new disaster resilience products, such as (i) instruments to improve business insurance coverage, (ii) initiatives to reduce business costs (i.e., for fuel, telecommunications, Internet, etc.), and (iii) capacity building for financial institutions in business loan processes and policies aligned to risks of business in Tonga | 0.1                  |                    |
| Preparation of local suppliers to meet relief needs in the case of future events (special campaigns/workshops)   | 0.1                  |                    |
| <b>TOTAL</b>   | <b>1.5</b>           |                    |

Photo: Malani Wolfgramm/World Bank. Damage to Revenue and Customs building, Tongatapu.



4.1.3 TOURISM

Damage and losses to the tourism sector totalled T \$40.6 million

4.1.3.1 Summary

The tourism sector encompasses accommodation, restaurants, marine tours, tour operators, and travel agencies.<sup>20</sup> Listed in the National Accounts as the “hotels and restaurants” sector, tourism represents T\$26.9 million in earnings (3.2 percent of 2016 GDP).<sup>21</sup>

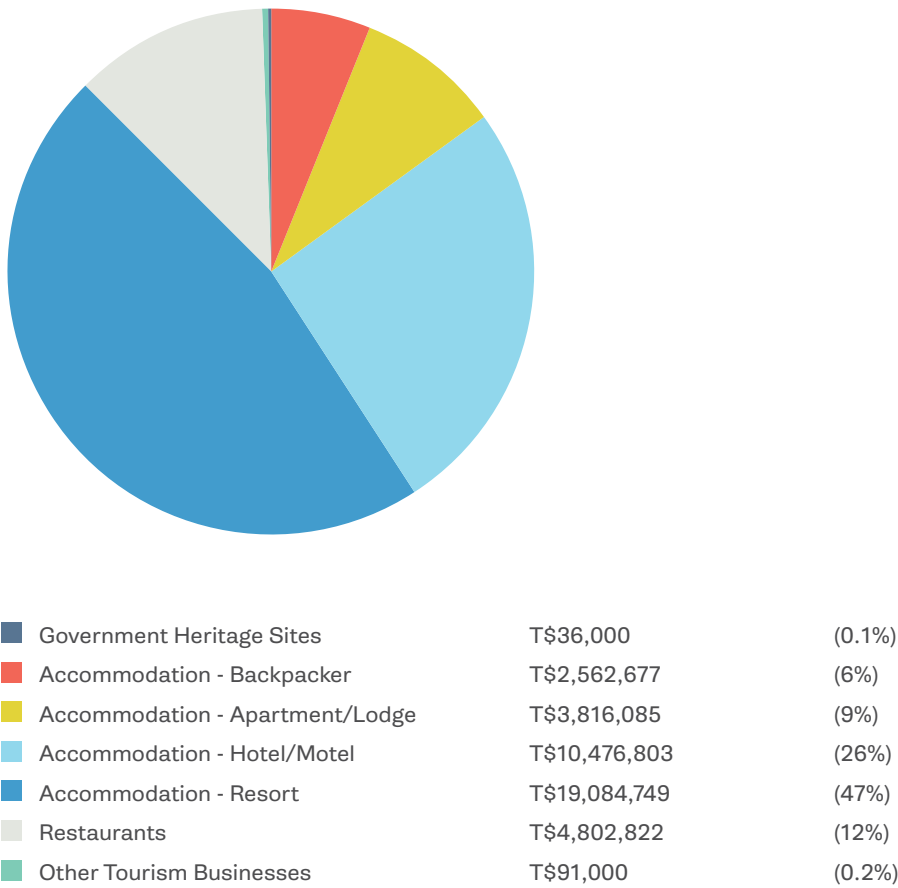
The total effects of Tropical Cyclone Gita on the tourism sector are estimated at T\$40.6 million. This represents T\$26.3 million in approximate damages and T\$14.3 million in expected losses. Figure 10 provides a breakdown of total effects according to type of tourism operation and shows that 88 percent of all effects

were felt by the accommodation subsector.

Of the total T\$26.3 million in damage, 90 percent was incurred by damage to accommodation buildings, furnishings, equipment, and other assets. Around 72 of the 76 accommodation businesses on Tongatapu and ‘Eua sustained damage, with 25 percent suffering major damage. The resort category (14 properties) was the most affected, facing T\$12.1 million in damages, of which an estimated T\$9.5 million is uninsured.

The T\$14.3 million in economic losses to Tonga’s tourism sector reflects the loss in revenues for the industry based on cancellations to date, an expected fall in international visitor numbers in the short term, and/or extended closure of some restaurants and accommodation businesses. It also reflects higher operational costs incurred by the private sector due to the disaster. The losses will be felt more by beach/island resorts, backpackers accommodations, and lodges targeting tourists, especially those located outside Nuku’alofa; these are experiencing disproportional declines in business compared to some hotels in town, which are facing minimal losses (and possibly gains) as they meet the atypical demand for workers associated with cyclone recovery.

FIGURE 10.  
Breakdown of Total Effects of TC Gita on Tonga’s Tourism Sector (T\$)





This disparity is compounded for the resort category, which has the longest time frames for reconstruction and reopening.

Recovery needs for the sector are estimated at least T\$35.4 million, including reconstruction of damaged properties with sufficient investment to build back better using resilient structures and practices. Most of this (T\$32.5 million) is required in the immediate term for reconstruction and for a recovery marketing campaign. The former requires dedicated efforts to overcome constraints on affected businesses' access to finance. A further (minimum) T\$2.9 million will be required in the short term for other programs aimed at providing SMEs in the tourism sector with access to an appropriate disaster insurance product, strengthening tourism SME operations, and strengthening tourism development and marketing for Tonga overall. Although these recommendations are not solely associated with the effects of the disaster, the event has highlighted the challenges facing the sector and its limited capacity to recover and grow unless these are addressed.

#### 4.1.3.2 Tourism Sector Background

The Government of Tonga places a high priority on tourism (alongside agriculture and fisheries). Its vision is for tourism to be the key driver of Tonga's sustainable future economic growth, enhancing the nation's unique culture and heritage, supporting environmental protection, and increasing wealth for all Tongans. The tourism sector currently sits at 3.2 percent of GDP, reflecting an increase of 17 percent in absolute terms over the preceding five-year period. Before TC Gita, tourism's contribution to GDP was forecast to grow 11 percent overall in the five years to 2021. The government recognizes that the economic contribution of tourism overall may be underestimated, and according to the World Travel and Tourism Council (WTTC 2017), the direct value of the travel and tourism sector for Tonga in 2017 was T\$57.2 million and the sector directly provided around 2,500 jobs.

International visitor arrivals by air to Tonga have grown 44 percent over the past 10 years, to reach a peak of 62,500 in 2017.<sup>22</sup> While the number of overnight visitor arrivals is modest compared to neighboring Pacific Island destinations, the rate of growth is comparable. Approximately 40 percent of international air arrivals are traveling for the primary purpose of a holiday, 45 percent to visit friends and relatives (the "VFR" segment), and 8 percent to attend a conference or conduct business. Around 8 percent travel for "other" purposes. The key source markets of New Zealand and Australia represent around 70 percent of all overnight visitors, and the main drawing cards for tourists are marine activities (in particular whale watching during the July to September season), soft adventure, and culture-based experiences.

Tourism product uptake, length of stay, expenditure, and dispersal patterns vary across and within market segments, but there are currently segment-specific data for these indicators. Therefore, an average length of stay of four days is applied across all tourism segments, as is an average per person expenditure of T\$2,000 per visit<sup>23</sup> (pending the release of official figures from the Ministry of Revenue and Customs). In terms of locations visited, it is estimated that Tongatapu receives 30 percent of visitor nights, Vava'u 40 percent, Ha'apai 20 percent, and 'Eua 10 percent.

The growth of cruise ship visits has also contributed to the expansion of Tonga's tourism sector. In 2017 there were 19 cruise ships carrying almost 22,000 passengers visiting ports in Tonga, more than double the cruise passenger numbers seen in 2013. Approximately 25 percent of these passengers disembark from ships, spending around T\$200 each on tours, restaurants, and shopping.<sup>24</sup> Finally, the smaller but reportedly higher-spending private yachting market generates around 2,000 arrivals annually.

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20. These categories are based on current records held by the Ministry of Tourism (MoT), which has taken on many activities previously delivered by the now defunct Tonga Tourism Authority (TTA). It should be noted that under the Tonga Tourism Authority Act (expected to be repealed), a range of other tourism-related businesses are covered, including but not limited to taxi services and handicrafts. However, MoT does not have access to business registration records, which sit with the MCCTIL's Business Registries Office. Therefore, the tourism sector assessment is based on the five categories outlined above, for which the MoT has information. Taxis and handicrafts are covered under the commerce and industry section.

21. GDP figures for 2016 are from Ministry of Finance and National Planning.

22. Arrivals data are from the Ministry of Tourism.

23. Interim estimates are from the Ministry of Tourism.

24. Estimates are from the Ministry of Tourism.

**TABLE 23. Tourism Businesses in Tonga and in the Cyclone-Affected Areas of Tongatapu and 'Eua**

| ACCOMMODATION TYPE                              | TOTAL NUMBER<br>IN TONGA | TOTAL NUMBER IN AFFECTED AREAS |          |            |
|---|--------------------------|--------------------------------|----------|------------|
|   |                          | Tongatapu                      | 'Eua     | Total      |
| Backpacker Accommodations                       | 26                       | 13                             | 2        | 15         |
| Apartment & Lodges                              | 29                       | 25                             | 1        | 26         |
| Hotels & Motels                                 | 28                       | 21                             | 0        | 21         |
| Resorts   | 31                       | 12                             | 2        | 14         |
| <b>Accommodation Total</b>                      | <b>114</b>               | <b>71</b>                      | <b>5</b> | <b>76</b>  |
| <b>Restaurant Total</b>                         | <b>71</b>                | <b>41</b>                      | <b>0</b> | <b>41</b>  |
| <b>Inbound Tour Operator/Travel Agent Total</b> | <b>5</b>                 | <b>5</b>                       | <b>0</b> | <b>5</b>   |
| <b>Water-Based Tour Company</b>                 | <b>35</b>                | <b>5</b>                       | <b>3</b> | <b>8</b>   |
| <b>TOTAL NUMBER OF TOURISM BUSINESSES</b>       | <b>225</b>               | <b>122</b>                     | <b>8</b> | <b>130</b> |

Note: Restaurant numbers do not include the estimated 60 restaurants located in accommodation properties.

**TABLE 24. Damage and Losses in the Tourism Sector by Subsector (T\$ millions)**

| SUBSECTOR   | DAMAGES       | LOSSES       | TOTAL<br>EFFECTS | PRIVATE<br>(PERCENTAGE<br>OF TOTAL) | PUBLIC<br>(PERCENTAGE<br>OF TOTAL) |
|---|---------------|--------------|------------------|-------------------------------------|------------------------------------|
| Backpacker Accommodation                            | 2.3           | 0.276        | 2.6              | 100%                                |                                    |
| Apartment/Lodge<br>Accommodation                    | 2.8           | 1.0          | 3.8              | 100%                                |                                    |
| Hotel/Motel Accommodation                           | 6.5           | 3.9          | 10.4             | 100%                                |                                    |
| Beach/Island Resort<br>Accommodation                | 12.1          | 6.9          | 19.0             | 100%                                |                                    |
| <b>Total Accommodation</b>                          | <b>23.7</b>   | <b>12.1</b>  | <b>35.8</b>      | <b>100%</b>                         |                                    |
| <b>Total Restaurants</b>                            | <b>2.6</b>    | <b>2.2</b>   | <b>4.8</b>       | <b>100%</b>                         |                                    |
| <b>Total Travel Agencies<br/>and Tour Operators</b> | <b>0.02</b>   | <b>0.058</b> | <b>0.078</b>     | <b>100%</b>                         |                                    |
| <b>Total Heritage Sites</b>                         | <b>0.0036</b> | <b>0</b>     | <b>0.0036</b>    |                                     | <b>100%</b>                        |
| <b>Sector Total</b>                                 | <b>26.3</b>   | <b>14.3</b>  | <b>40.6</b>      |                                     |                                    |

According to Ministry of Tourism (MoT) records, the majority of Tonga's accommodation and other tourism product supply is located on Tongatapu: 62 percent of the country's accommodation establishments are based there,<sup>25</sup> as are 58 percent of restaurants, all inbound tour operators/travel agents, and 14 percent of the water-based tourism businesses (e.g., whale-watching tours). 'Eua has less than 1 percent of tourism businesses, with just five accommodation properties and two water-based tour companies. MoT is currently working with the MCCTIL to reconcile the 709 tourism business licenses registered under the Business Registries Office with its own tourism product lists. The verified MoT figures are used in Table 23 to show the number of tourism businesses by type in Tonga overall, and specifically for the cyclone-affected islands.

Occupancy data are not available for accommodation establishments in Tonga, but establishments typically share the peak seasons of May through September, and the month of December. June to September is also the peak season for water-based tourism operations. For tour operators dealing with the cruise sector, as well as for restaurants and travel agencies, business revenue is reportedly spread throughout the year.

#### 4.1.3.3 Assessment of Disaster Effects on the Tourism Sector

The total effects of TC Gita on the tourism sector are estimated at T\$40.6 million. This represents T\$26.3 million in approximate damages and T\$14.3 million in expected losses. Table 24 shows the breakdown. Most (90 percent) of all effects were felt by the accommodation subsector.

##### Damage

An estimated 72 out of 76 accommodation establishments on Tongatapu and 'Eua sustained damage from Tropical Cyclone Gita, with at least 20 facing major damage, including one that was destroyed.<sup>26</sup> Structural damage such as loss of roofs and resulting water damage to rooms and contents, as well as flood damage, were experienced to varying degrees. Total damage is estimated at T\$26.3 million, based on a detailed assessment of the cost to repair/reconstruct buildings and replace furnishing, equipment, or other assets for a sample of 30 tourism businesses and government-owned heritage tourism sites. This amount comprises T\$23.7 million for damage to buildings, T\$2.6 million for furnishings and equipment, and T\$36,000 for other assets. Accommodation damage represents 90 percent of the total.

The beach and island resort category of accommodation was the most affected by the disaster, with an estimated T\$12.1 million in total damage, followed by the hotel and motel subsector at T\$6.5 million, the backpacker accommodation subsector at T\$2.3 million, and the apartments and lodges subsector at T\$2.8 million. Damage to tour operations/travel agencies is estimated at T\$20,000, and government-owned heritage tourism sites sustained damage to signage valued at T\$36,000.

The clustering of tourist accommodation in Nuku'alofa town and on Tongatapu's northwest coast meant that damage for the majority of establishments was seen in the three districts of Kokofo'ou, Kolomutu'a, and Kolovai. An estimated 29 percent of damaged accommodations (correlating to 22 properties) were able to undergo necessary repairs and resume operations within two weeks of the cyclone, and this figure reached 58 percent (44 properties) by the end of the first month. An additional 24 percent (17 properties) expect that repairs will take three to four months, and the remaining 19 percent (15 properties) anticipate they will not complete reconstruction for six to eight months. Rebuilding island and beach resorts will take longer than rebuilding most hotels, motels, apartments, lodges, and backpackers. Although an estimated 5 out of 14 resorts resumed operations within one month, two are not expected to complete repairs until July 2018 (allowing four months), and seven will be under construction until September 2018 (allowing eight months). Availability of funds will be critical to this timeline, and will be affected by low rates of insurance coverage. Some 61 percent of the surveyed accommodation businesses have insurance, but only 44 percent are covered for cyclone damage, with the backpacker and resort categories having the lowest level of cover, at 40 percent and 20 percent respectively. For the restaurant category, 80 percent of establishments are reported to have reopened "soon" after the storm, and an estimated 40 percent of restaurants have cyclone insurance.

25. The supply of actual rooms (number and percentage) for all of Tonga has yet to be determined because business data are unavailable.

26. Findings are based on a rapid site assessment of 61 accommodation properties, extrapolated to represent all 76 properties in Tongatapu and 'Eua.



## Losses

Economic losses to Tonga's tourism sector as a result of TC Gita are estimated at T\$14.3 million. This figure reflects the loss in revenues for the tourism industry based on cancellations to date, an expected fall in international visitor numbers in the short term, and/or extended closure of some restaurants and accommodation businesses. It also reflects higher operational costs incurred by the private sector due to the disaster.

Due to limitations with both macro tourism data and tourism business-level data, a dual approach has been applied to assess and verify the potential economic impact of the disaster. In the first instance, a top-down method estimates international visitor expenditure loss at T\$12.6 million by modeling a reduction in expected international visitor arrivals for 2018 due to the cyclone. Early indications of cancellations in Tonga's tourism industry, market insights, and post-disaster benchmarks for other destinations inform the assumption that visitor arrivals by air could reach 30 percent less than expected for February to June, which corresponds to 6,200 people fewer than originally anticipated.

Based on MoT visitor spending estimates of T\$2,000 per visitor per trip, this equates to T\$12.6 million in overall expenditure. It is assumed that with appropriate marketing, tourist arrivals by air could reasonably return to expected forecasts by July, as there will be sufficient room supply available to cater for them. This macro assessment also considers the cancellation of one cruise ship in February that was expected to generate T\$60,000 in expenditure by 300 disembarking passengers. These loss estimates should be validated or revised when updated actual immigration data, evidence of changes in market demand, and revised visitor spending averages (expected to be released by the Ministry of Revenue) are available. This approach does not account for losses facing resorts, hotels, and restaurants from interruptions to revenues from local dining, functions, and conference business. Therefore, a bottom-up method for estimating losses across tourism businesses is also used for this rapid assessment as a comparison.

Determining losses for tourism businesses based on findings for a sample group also faced limitations in this rapid assessment, as most interviewed tourism businesses were either not willing or not able to share revenue or loss figures. However, based on the information that could be gathered, revenue scenarios were modeled for each business type for 2017 and compared to 2018 after the cyclone, resulting in an estimate of T\$14.3 million in losses for accommodation, restaurant, inbound tour operator, and travel agent businesses in Tongatapu and 'Eua. Importantly, this approach has demonstrated that some hotels in town may face minimal losses (and possibly gains), as they are positioned to meet the atypical demand for workers associated with cyclone recovery. It has also demonstrated that conversely, beach/island resorts, backpackers, and lodges targeting tourists, especially those located in affected areas outside Nuku'alofa, are experiencing disproportional levels of losses in business due to interruption to operations and/or a drop in leisure tourist arrivals. Until both issues are overcome, losses for these types of accommodation businesses will likely accumulate. Based on cancellations to date and anticipated drop in demand and revenues during reconstruction and recovery, the expected loss of revenues for 2018 in Tongatapu's and 'Eua's accommodation establishments are as follows:

- T\$276,000 for the backpacker category, representing an average loss of T\$18,000 per property, or 17 percent of expected revenue;
- T\$1.0 million for apartments and lodges, representing an average loss of T\$40,000 per property, or 15 percent of expected revenue;
- T\$3.9 million for hotels and motels, representing an average loss of T\$186,000 per property, or 20 percent of expected revenue; and
- T\$6.9 million in 2018 for island/beach resorts, representing an average loss of T\$497,000 per property, or 35 percent of expected revenue.

In most cases, these losses will be felt in the short term (reconstruction/reopening time frames are described in the section on damages above), assuming investment in marketing will restore demand by July for those that have reopened, as there is expected to be sufficient room supply available. For around 15 properties for which reconstruction will continue until mid/late 2018, the impact of losses will be felt longer. Furthermore, the above loss estimates are based on accommodation supply in Tongatapu and 'Eua; however, properties in Ha'apai and Vava'u will also face losses if market demand is not restored by the peak season.

With respect to losses facing the restaurant subsector, these are expected to amount to at least T\$2.2 million based on the immediate losses reported for a small sample group following the disaster. The few inbound tour operators and travel agencies interviewed reported minimal losses; T\$58,000 in losses is estimated to date or in the coming months. Half of this is related to the one cruise ship cancellation during the cyclone. Finally, the losses for water-based tourism businesses are expected to be low, as the cyclone struck in the middle of the tourism industry low season. By the time the whale-watching season recommences in July, demand is expected to resume based on sufficiently restored room supply and marketing efforts. These business-level estimates should be validated or revised with new reports of losses from tourism businesses and evidence of changes in market demand.

In addition to lost revenues, tourism businesses affected by the cyclone have faced higher operational costs, including labor for cleanup, housing/feeding of staff, and the costs of running a generator. However, data on these cost estimates are sparse and show significant variances. In-depth follow-up with a few accommodation providers indicates that these costs, typically paid in cash out of pocket, had not been considered and/or were underestimated by many tourism operators.

Businesses will need to invest funds into replacing and repairing damaged assets, and additional costs will be incurred by the private and public sector to undertake marketing and promotion to recover market demand. Additional marketing investment to be committed by the private sector has yet to be determined, but there is an expectation that a Tonga-wide post-disaster marketing campaign is needed. It is expected that approximately T\$800,000 needs to be invested in the immediate term to enable this. The premise that market demand projections can be restored by July is based on this estimate.

#### **4.1.3.4 Recovery Strategy and Needs for the Tourism Sector**

For the tourism sector to build on gains of recent years and become a key source of growing foreign receipts and employment, it is essential that a focused recovery strategy is implemented over the immediate, short, and medium term. Tonga's tourism sector depends on SMEs, and the impact of damage and losses to many of them—accommodation SMEs in particular—is a significant risk to their cash flow, and subsequently their capacity to resume and sustain operations. The scale of the tourism sector in Tonga is sufficiently small that if several popular tourist accommodation businesses fail to recover, the country's destination supply and its brand image could be affected. One response that is already in place to redress business cash flow concerns is the Tonga Development Bank's (TDB's) three-month waiver on loan repayment, but there are additional recovery needs.

Recovery needs for the sector are estimated at least T\$35.4 million, including reconstruction of damaged properties with sufficient investment to build back better using resilient structures and practices. Most of this (T\$32.5 million) is required in the immediate term for reconstruction and marketing recovery priorities (Table 25). Total reconstruction costs for businesses are estimated at T\$31.5 million (including a 20 percent resilience factor), and it is estimated that only T\$10.5 million of this is covered by insurance.

Therefore, to enable in-need SMEs to build back better and resume operations as soon as possible, ensuring access to finance through the TDB and commercial banks should be a priority. Another immediate-term priority is a targeted consumer marketing campaign that restores market demand; approximately T\$800,000 is needed for this before June to expedite proposed marketing plans and drive sales.

Short-term needs include scoping and mobilizing an appropriate disaster insurance product for tourism SMEs, as well as a series of programs to strengthen the sector overall, including strengthening tourism SME business management systems, reforming the institutional arrangements for tourism, improving the quality of tourism data, and rolling out focused destination development and marketing strategies (Table 26). These amount to T\$2.9 million, not including the mobilization costs for resulting studies. Although these needs are not solely associated with the effects of the disaster, the event has highlighted the challenges facing the sector and its limited capacity to recover and grow unless these are addressed.

In the medium term, any outstanding recovery needs will be addressed under the Ministry of Tourism's implementation of tourism development and marketing plans, assuming sufficient funding is assigned to the ministry in line with its corporate plan.

**TABLE 25. Immediate Recovery Needs in the Tourism Sector**

| NEED   | PROGRAM OF ACTIVITY   | VALUE                         | RESPONSIBLE AGENCY   |
|--|---|-------------------------------|--|
| Reconstruct tourism businesses/ and heritage site assets | Reconstruct damaged accommodation, restaurant, and other tourism businesses (some completed, some under way, some yet to occur)   | T\$31.5 million <sup>27</sup> | Insurance companies, private sector, TDB, commercial banks (with assistance) |
|  | Provide the tourism private sector with necessary technical guidance and materials to build back better with more resilient structures (workshop to be held engaging external expertise)  | T\$150,000                    | MoT and other TBA  |
|  | Waive import duty on construction materials required for rebuilding, as well as furnishings and equipment for damaged businesses  | TBA                           | MoT and other TBA  |
|  | Replace damaged signage at heritage sites with resilient signage  | T\$72,000                     | MoT  |
| Undertake a targeted marketing campaign                  | Work with travel distributors (e.g., Trip Advisor, travel wholesalers, airlines) in key target markets to overcome any market uncertainty about Tonga's readiness to resume tourism business, and drive sales of product-ready packages | T\$800,000                    | MoT with opportunities for private sector buy-in                             |
| <b>TOTAL</b>   |   | <b>T\$32.5 MILLION</b>        |  |

27. Figure includes T\$28.5 million to rebuild with resilience in accommodation subsector, T\$3.0 million to rebuild in restaurants. Approximately T\$10.5 million covered by insurance; T\$21.0 million required in self- or commercial financing.

Photo: Malani Wolfram/World Bank.  
Arrival of cruise ship in Nuku'alofa in March 2018, following the cyclone.





**TABLE 26. Short-Term Recovery Needs in the Tourism Sector**

| NEED  | PROGRAM OF ACTIVITY  | VALUE  | RESPONSIBLE AGENCY                         |
|---|--|--|--|
| Introduce a suitable natural disaster insurance product | Explore options for providing a portfolio insurance product through banks that provides tourism SMEs with appropriate natural disaster cover to increase the low coverage rates and ease the burden in the event of future disasters (especially relevant to the resort accommodation category); could build on current work under way in Fiji | T\$250,000   | Commercial banks (with assistance)         |
| Strengthen tourism SME financial management             | Undertake training and provide resources to equip tourism SMEs with the skills and tools to manage their business records and understand critical financial indicators in times of disaster and/or when finance is needed for business improvements  | T\$150,000   | MoT (with assistance)                      |
| Strengthen institutional arrangements for tourism       | Undertake a review of the institutional arrangements for tourism in Tonga and determine an appropriate structure for licensing, destination development, and marketing (to address issues limiting this disaster assessment, but more importantly enable sector growth)  | T\$150,000 for the review; implementation funds to be determined via the review  | Government of Tonga, MoT (with assistance) |
| Strengthen tourism sector data                          | Build tourism data collection and management practices and resources within the Ministry of Tourism (will entail a supply analysis and visitor survey project)   | T\$150,000   | MoT, MoS (with assistance)                 |
| Strengthen Tonga as a tourism destination               | Prepare and implement a tourism development plan that supports growth of the sector by identifying additional programs to strengthen existing product and opportunities to diversify supply to attract best-prospect markets   | T\$200,000 for preparing plan; implementation funds to be determined in the plan | MoT  |
|   | Develop and mobilize an associated strategy for targeted, cost-effective marketing (to continue from immediate market response)  | T\$2.0 million (partly covered by MoT budget)                                    | MoT, private sector                        |
| <b>TOTAL</b>  |  | <b>T\$2.9 MILLION<sup>28</sup></b>   |  |

28. This figure excludes mobilization of tourism development plan.

**TABLE 27. Medium-Term Recovery Needs in the Tourism Sector**

| NEED                                  | PROGRAM OF ACTIVITY   | VALUE            | RESPONSIBLE AGENCY    |
|---------------------------------------|---|------------------|-----------------------|
| Strengthen Tonga as a destination     | Implement above tourism development plan and continue marketing activities                              | Under MoT budget | MoT (with assistance) |
| Establish a Tourism Satellite Account | Establish a Tourism Satellite Account for Tonga to accurately measure contribution of the sector to GDP | Under MoT budget | MoT, MOFNP            |

## 4.2 SOCIAL SECTORS

### Damage and losses to social sectors totaled T \$134.22 million

#### 4.2.1 HOUSING

### Damage and losses to the housing sector totaled T \$111.62 million

##### 4.2.1.1 Summary

Tropical Cyclone Gita left 808 private houses destroyed and 3,985 damaged. Of the damaged houses, 63 percent suffered minor damage and 36 percent major damage. In Tongatapu, 6 percent of houses were destroyed and 27 percent damaged, while in 'Eua, 7 percent were destroyed and 50 percent damaged. It can be concluded that in the housing sector, the severest brunt of the cyclone was felt in 'Eua; Figure 11 shows that 56 percent of housing stock was damaged in 'Eua, compared to 33 percent in Tongatapu.

The total cost of damage in the sector, including the cost of infrastructure and assets, amounted to T\$111.6 million (Figure 12). Losses in the sector were negligible, at T\$0.016 million (Figure 13), and derived from loss of income from rental properties.

The cost of recovery to the sector is T\$112.1 million; this takes into account the cost of reconstruction with resilience (BBB). Short-term recovery needs are expected to cost T\$5.8 million, which would be drawn from the TC Gita relief funds. Recovery needs have been informed by the Tonga Strategic Development Framework 2015–2025, which identifies the best housing outcome following a disaster as “more reliable, safe and affordable buildings and other structures” (Government of Tonga 2015).

The recovery costs do not include any relocation costs, as no evidence suggesting the need for relocation has been brought to the attention of the Assessment Team.

A number of programmatic options have been advanced in the sector for reconstruction and repair with resilience. These include in-kind replacement for the poorest; matching grants; a low-interest credit facility; and community-driven repairs coupled with cash-for-work programs for young unemployed persons that lead to certification through training and apprenticeship programs.

In the future, Tonga will need to develop programs that deliver technical assistance for retrofitting at the community level and microinsurance at the household level. It will also need to find ways to promote the best use of personal savings in the construction and repair of houses.



#### 4.2.1.2 Housing Sector Background

According to Tonga's 2016 Population and Housing Census (Tonga Statistics Department 2017), there are 12,953 households in Tongatapu and 885 in 'Eua.<sup>29</sup> Over half (56.4 percent) of the households in Tongatapu and nearly half (48.02 percent) of those in 'Eua live in housing with outer walls built of timber, while 39.68 percent of households in Tongatapu and 47.23 percent of those in 'Eua live in housing with walls built of brick (Table 28).

Tongatapu and 'Eua have average household sizes of 5.7 and 5.6, respectively, which are larger than the national average of 5.5. 33 percent of households are engaged in home-based economic activities such as production and sale of handicrafts and home-processed foods (Kingdom of Tonga 2017). The assessment of the housing sector excluded home-based economic activities, which are captured in the commerce and tourism sectors.

Housing in Tonga is financed through the local banking sector, remittances, and private savings. This varied approach has implications for the proportion of housing that is covered by insurance and may influence reconstruction policy.

#### 4.2.1.3 Assessment of Disaster Effects on the Housing Sector

This assessment took into consideration houses with outer walls built of timber and concrete, and excluded those of metal, traditional materials, and other materials, since these represented a very small proportion of the housing stock in 'Eua and Tongatapu (Tonga Statistics Department 2017).

Private houses suffered both total and partial damage; 808 private houses were destroyed and 3,965 were damaged, meaning that a total of 4,773 households were affected out of an estimated 13,838 households in Tongatapu and 'Eua. Of the damaged housing stock, 63 percent suffered minor damage and 36 percent suffered major damage. The effects of TC Gita destroyed the housing of 6 percent of Tongatapu households and damaged the housing of 27 percent, while in 'Eua, 7 percent of houses were destroyed and 50 percent suffered damage. It can be concluded that in the housing sector, 'Eua felt the severest brunt of the cyclone (Table 29).

The damage to housing infrastructure in 'Eua—both minor and major—suggests that there was little difference in the effects of TC Gita on timber versus masonry houses. The data suggest that of all houses built of masonry, 2 percent suffered destruction; among houses constructed of timber, the figure is 11 percent. Unfortunately, data on the age structure of the households were unavailable.

#### Damage

The cost of the damage to infrastructure and assets in the housing sector amounts to T\$111.6 million, of which 16 percent (T\$18.1 million) can be attributed to household assets. See Table 30 for details.

#### Losses

Losses to the sector were small, at T\$16,000. The sum represents loss in income from rental properties, which are negligible in 'Eua and comprise a small proportion of housing in Tongatapu (Tonga Statistics Department 2017). Table 31 shows the breakdown of the losses by district.

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29. The census defines "households" as units consisting of persons "who usually eat together and share the work of preparing the food and/or the cost of work of providing it. Generally, household members live and sleep in the same building although this is not always the case. Hence, the definition is based on eating together rather than on living or sleeping in the same building or dwelling." Tonga Statistics Department 2017.

**FIGURE 11.**

Share of Damaged or Destroyed Houses in Tongatapu and 'Eua

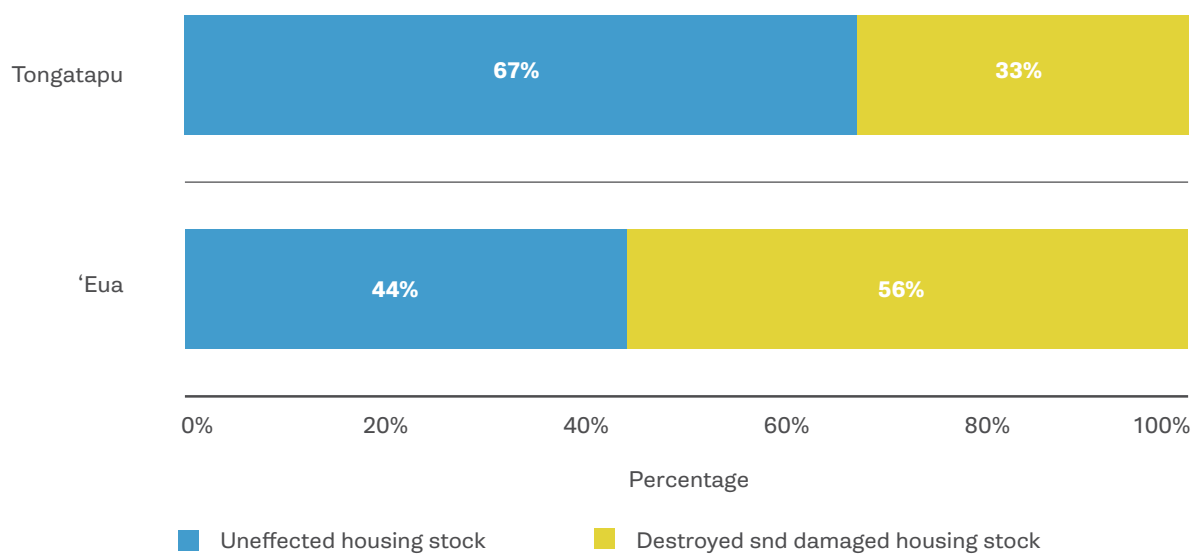
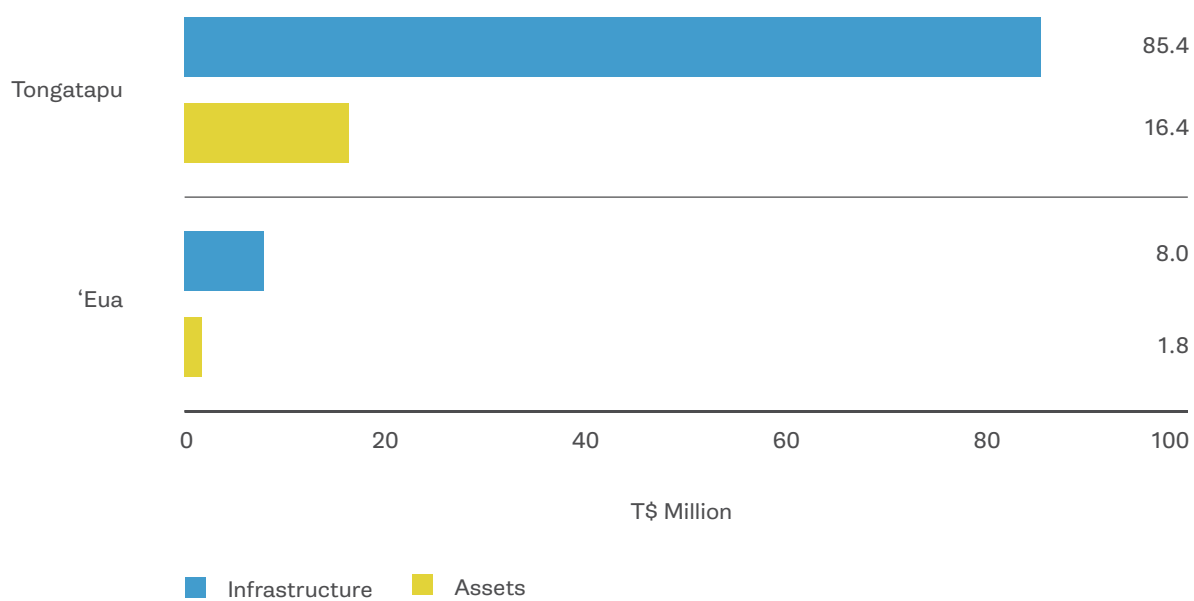


Photo: Malani Wolfgramm/World Bank. Damaged home in Longolongo, Tongatapu.



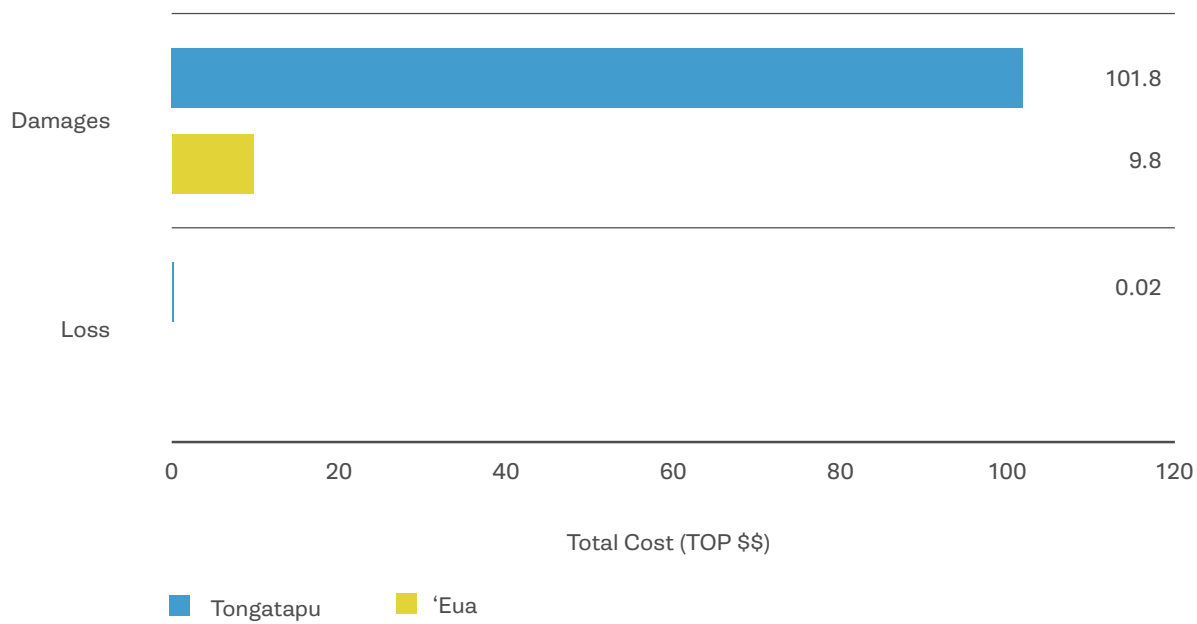
**FIGURE 12.**

Damage to Housing Infrastructure and Assets (T\$ million)



**FIGURE 13.**

Total Effects to the Housing Sector (T\$ million)





**TABLE 28. Construction Material Used on Outer Walls in Private Housing**

| DIVISION/DISTRICT/<br>REGION | TOTAL         | WOOD,<br>MASONITE | METAL, IRON,<br>ALUMINUM | CONCRETE,<br>CEMENT,<br>BRICK | TRADITIONAL<br>MATERIAL | OTHER     |
|------------------------------|---------------|-------------------|--------------------------|-------------------------------|-------------------------|-----------|
| <b>TONGA</b>                 | <b>18,005</b> | <b>10,391</b>     | <b>666</b>               | <b>6,864</b>                  | <b>39</b>               | <b>45</b> |
| Tongatapu                    | 12,953        | 7,310             | 442                      | 5,140                         | 29                      | 32        |
| Kolofo'ou                    | 3,108         | 1,800             | 91                       | 1,207                         | 8                       | 2         |
| Kolomotu'a                   | 3,031         | 1,797             | 79                       | 1,139                         | 5                       | 11        |
| Vaini                        | 2,201         | 1,228             | 83                       | 880                           | 4                       | 6         |
| Tatakamotonga                | 1,248         | 672               | 50                       | 520                           | 2                       | 4         |
| Lapaha                       | 1,234         | 615               | 55                       | 559                           | 3                       | 2         |
| Nukunuku                     | 1,391         | 749               | 59                       | 571                           | 7                       | 5         |
| Kolovai                      | 740           | 449               | 25                       | 264                           | 0                       | 2         |
| <b>'EUA</b>                  | <b>885</b>    | <b>425</b>        | <b>37</b>                | <b>418</b>                    | <b>0</b>                | <b>5</b>  |
| 'Eua Motu'a                  | 508           | 261               | 27                       | 216                           | 0                       | 4         |
| 'Eua Fo'ou                   | 377           | 164               | 10                       | 202                           | 0                       | 1         |

Source: Tonga Statistics Department 2017, table H5.

**TABLE 29. Effects of TC Gita on Private Housing**

| DIVISION           | DISTRICT        | NUMBER OF HOUSES<br>DESTROYED | NUMBER OF HOUSES<br>WITH MINOR<br>DAMAGE | NUMBER OF HOUSES<br>WITH MAJOR<br>DAMAGE |
|--------------------|-----------------|-------------------------------|--|--|
| Tongatapu          | Kolofo'ou       | 197                           | 582                                      | 328                                      |
|                    | Kolomotu'a      | 139                           | 444                                      | 250                                      |
|                    | Vaini           | 97                            | 268                                      | 151                                      |
|                    | Tatakamotonga   | 58                            | 233                                      | 131                                      |
|                    | Lapaha          | 88                            | 340                                      | 192                                      |
|                    | Nukunuku        | 110                           | 270                                      | 152                                      |
|                    | Kolovai         | 61                            | 131                                      | 73                                       |
|                    | <b>Subtotal</b> | <b>750</b>                    | <b>2,269</b>                             | <b>1,276</b>                             |
| 'Eua               | 'Eua Motu'a     | 18                            | 121                                      | 59                                       |
|                    | 'Eua Fo'ou      | 40                            | 147                                      | 93                                       |
|                    | <b>Subtotal</b> | <b>58</b>                     | <b>268</b>                               | <b>152</b>                               |
| <b>GRAND TOTAL</b> |                 | <b>808</b>                    | <b>2,537</b>                             | <b>1,428</b>                             |

Source: Estimates based on government data.

**TABLE 30. Damage and Losses in the Housing Sector by Subsector (T\$ millions)**

| SUBSECTOR           | DAMAGE       | LOSSES      | TOTAL EFFECTS |
|---------------------|--------------|-------------|---------------|
| Infrastructure      | 93.4         | 0           | 93.4          |
| Assets              | 18.2         | 0           | 18.2          |
| Rental Income       |              | 0.02        | 0.02          |
| <b>SECTOR TOTAL</b> | <b>111.6</b> | <b>0.02</b> | <b>111.6</b>  |

Source: Estimates based on government data. Note: Data are for private housing only.

**TABLE 31. Damage and Losses in the Housing Sector by District (T\$ millions)**

|                             | DISTRICT      | DAMAGE        | LOSSES      | TOTAL EFFECTS |
|-----------------------------|---------------|---------------|-------------|---------------|
| <b>INFRASTRUCTURE</b>       |               |               |             |               |
| Tongatapu                   | <b>Total</b>  | <b>85.42</b>  | <b>0.02</b> | <b>85.44</b>  |
|                             | Kolofo'ou     | 22.26         | 0           | 22.26         |
|                             | Kolomotu'a    | 16.14         | 0           | 16.14         |
|                             | Vaini         | 10.72         | 0           | 10.72         |
|                             | Tatakamotonga | 7.36          | 0           | 7.36          |
|                             | Lapaha        | 11.00         | 0           | 11.00         |
|                             | Nukunuku      | 11.71         | 0           | 11.71         |
|                             | Kolovai       | 6.24          | 0           | 6.24          |
| 'Eua                        | <b>Total</b>  | <b>8.00</b>   | <b>0.00</b> | <b>8.00</b>   |
|                             | 'Eua Motu'a   | 2.77          | 0           | 2.77          |
|                             | 'Eua Fo'ou    | 5.23          | 0           | 5.23          |
| <b>TOTAL INFRASTRUCTURE</b> |               | <b>93.42</b>  | <b>0.02</b> | <b>93.44</b>  |
| <b>ASSETS</b>               |               |               |             |               |
| Tongatapu                   |               | 16.40         | 0.00        | 16.40         |
| 'Eua                        |               | 1.79          | 0.00        | 1.79          |
| <b>TOTAL ASSETS</b>         |               | <b>18.19</b>  | <b>0</b>    | <b>18.19</b>  |
| <b>SECTOR TOTAL</b>         |               | <b>111.61</b> | <b>0.02</b> | <b>111.63</b> |

Source: Estimates based on government data. Note: Data are for private housing only.

#### 4.2.1.4 Recovery Strategy and Needs for the Housing Sector

The recovery strategy is based on the needs as identified during this assessment and is informed by the Tonga Strategic Development Framework 2015–2025. The cost of recovery to the sector is T\$112.1 million, which represents the full reconstruction of 202 houses at Category 4 standard. Should the decision be made to support the construction of core housing, this would reduce the recovery cost to T\$102.6 million. Support amounting to T\$5.8 million for immediate recovery (to June 2018) is expected to come from the TC Gita relief fund (Table 32).

Two options are presented for the short-term reconstruction of the 808 homes that have been fully destroyed.

Option 1 offers a mix of three approaches (Table 33).

- Direct in-kind replacement for the poorest and most vulnerable households, through delivery of either a core house or a full structure;
- Low-interest loans for the salaried and waged income householders; and
- Financing through conditional grants such as match funds (matching skills to funds or funds to funds) for the near poor.

In this option, some T\$26.7 million, or 25 percent of the total cost, may be sought through local banking institutions, which have already begun extending low-cost loans at 5 percent interest.

Option 2 offers a mix of two approaches:

- In-kind replacement for the poorest of the poor (approximately 202 households), through delivery of core houses or full structures; and
- Conditional grant funding through match funds (matching funds to funds or skills to funds) for all others who have lost homes.

Tonga's Strategic Development Framework 2015–2025 (Government of Tonga 2015) identifies the need for "more reliable, safe and affordable buildings and other structures, taking greater account of local conditions, helping to lower construction, maintenance and operating costs, increase resilience to disasters, improve the quality of services provided and facilitate increased access."<sup>30</sup> With this in mind, the reconstruction strategy for the medium term recommends that young persons—who comprise some 16 percent of the unemployed—be involved in the repair of houses. They could be provided with the opportunity for training, and with supervision they could participate in community-driven projects for building back better. Certification of participants could incentivize young people to participate in a cash-for-work program (Table 34).

Lessons learned from past approaches to recovery suggest that community engagement in the process is essential to success, at all stages of planning, construction/repair, and distribution. The future of the management of the housing sector requires development of programs that deliver technical assistance for retrofitting at the community level and microinsurance at the household level. Technical assistance is also needed to promote better management and sharing of risk and to offer guidance on the best use of personal savings in the construction and repair of houses.

The recovery needs presented below acknowledge the ongoing development of a housing sector policy and strategy.

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30. The quotation is from Organisational Outcome 4.4.



**TABLE 32. Immediate Recovery Needs in the Housing Sector**

| PROGRAM OF ACTIVITY  | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY  |
|--|----------------------|---|
| A short-term program that makes repair materials available to households who have suffered as a result of TC Gita; households are expected to receive material support ranging from T\$500 for minor damage to T\$1,500 for major damage and T\$3,000 for totally destroyed property | 5.8                  | NGOs (MORDI, Care, CARITAS, and Habitat for Humanity) in collaboration with (MOI); TC Gita relief funds |

Note: This activity is based on a proposed strategy from the shelter cluster. MOI = Ministry of Infrastructure.

**TABLE 33. Short-Term Recovery Needs in the Housing Sector**

| PROGRAM OF ACTIVITY   | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY  |
|---|----------------------|---|
| Reconstruction of 202 houses (through in-kind replacement) for the most vulnerable households (based on the recent HEIS survey)   | 18.0 <sup>a</sup>    | NGOs (MORDI, Care, CARITAS, and Habitat for Humanity) in collaboration with (MOI); TC Gita relief funds |
| Provision of a combination of solutions, including conditional grants for households classified as near poor, and a credit facility with a low interest rate (5 percent) for households not classified as poor or near poor | 54.1                 | Local banking agencies, MOFNP, MOI  |
| <b>TOTAL</b>  | <b>72.1</b>          |   |

a. This cost would reduce to T\$8.5 million if 202 core houses were to be rebuilt.

**TABLE 34. Medium-Term Recovery Needs in the Housing Sector**

| PROGRAM OF ACTIVITY   | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY  |
|---|----------------------|---|
| Owner- or community-driven projects offering conditional grants, technical assistance, and training for residents of houses that have suffered major or minor damage in both Tongatapu and 'Eua | 40.0                 | NGOs (MORDI, Care, CARITAS, and Habitat for Humanity) in collaboration with (MOI); TC Gita relief funds |
| Youth training and certification in housing repair for an initial 10-day period, followed by an on-the-job apprenticeship; certification to be awarded after a 3-6 month period                 | 0.5                  | MOFNP, MOI, MOET, Ministry of Internal Affairs  |
| <b>TOTAL</b>  | <b>40.5</b>          |   |

Note: An inflation rate of 5.5 percent would increase the cost of medium-term recovery needs by T\$5.9 million in the first year and an additional 5.5 percent a year thereafter.

## 4.2.2 EDUCATION

### Damage and losses to the education sector totaled T \$21.95 million

#### 4.2.2.1 Summary

Education infrastructure across Tongatapu and 'Eua was severely impacted by the effects of TC Gita: damage was estimated at T\$19.8 million and losses at T\$2.2 million. Schools perform a vital role in the community, and the rapid recovery of school infrastructure enables students to regain a sense of normalcy and helps the community move forward in the aftermath of a disaster. Hence immediate action is required to return classes to permanent facilities as soon as possible and minimize disruption to students' education.

A Rapid Assessment conducted by the Ministry of Education and Training (MOET) found that across Tongatapu and 'Eua, approximately 60 percent of early childhood education (ECE) centers, 75 percent of primary schools, 88 percent of secondary schools, and 56 percent of tertiary institutes were directly affected. Of Tonga's 150 schools, with approximately 23,000 students at all levels of education, 109 schools were affected. As shown in Figure 14, 22 percent of the school building stock was damaged or destroyed in the affected areas.

As a result of TC Gita, all schools were closed for four days (February 12–19), although a rapid cleanup following the storm allowed students to return to most schools quickly. Temporary relief to damaged schools was provided by UNICEF "education in emergencies" supplies, consisting of school-in-a-box kits, temporary learning spaces (tents), tarpaulins, recreation kits, early childhood development kits, and backpacks for students.

The cyclone severely damaged education facilities (such as classrooms, staff houses, dormitories), water and sanitation facilities, and associated school furniture, books, and other resources. Specifically:

- 30 classrooms were damaged beyond repair, 85 had major damage, and 120 had minor damage;
- 45 staff houses require repair or reconstruction;
- 29 ECE centers were damaged;
- Water tanks and sanitation facilities were damaged or destroyed; and
- School resources and furniture were damaged or destroyed.

Approximately T\$13.0 million in infrastructure damage was recorded, along with T\$6.8 million in asset damage and T\$2.2 million in losses (Figure 15). The large number of school buildings damaged highlights the issues of substandard construction, lack of regular maintenance, and aging structures that require replacement. Damage observed at several recently upgraded school buildings highlights the need for engineer-certified designs for all new and retrofitted school buildings, as well as mandatory inspections during construction by qualified professionals.

A phased, strategic, and long-term approach to school repair, retrofitting, and reconstruction is required so that schools can return to normal operation as soon as possible. It is important to invest in upgrading the remaining school building stock in order to ensure greater hazard resilience and minimize future impacts on students' education.

#### 4.2.2.2 Education Sector Background

Tongatapu and 'Eua have 48 ECEs, 69 primary schools, 24 secondary schools, and 9 tertiary institutions. In total, close to 23,000 students are enrolled in schools and therefore at risk if school infrastructure is not safe and resilient to natural hazards.

Approximately 40 percent of Tongan schools are government operated, and the remaining 60 percent are nongovernment schools. Prior to TC Gita, there was no demand to increase the number of schools, but the need to replace the existing school infrastructure was increasing.

A large proportion of the existing school infrastructure stock is in poor condition, with many schools requiring repair, retrofitting, or replacement to ensure that they are resilient to natural hazards. A survey undertaken by the MOET in 2015 estimated that over 40 percent of public school classrooms were in need of repair and/or reconstruction.<sup>31</sup>

#### 4.2.2.3 Assessment of Disaster Effects on the Education Sector

School infrastructure sustained damage from high winds that destroyed roofs, smashed windows with flying debris, and collapsed structures. Many buildings were subsequently water damaged from heavy rainfall that penetrated indoors after roofs were lost. In low-lying areas, water flooded the floors of buildings, bringing with it silt and debris. Septic tank systems were flooded from rising groundwater, and tank water supply systems were compromised as gutters were torn from buildings. A large proportion of the damage costs (35 percent) was from destroyed assets contained within the buildings.

In the weeks following the storm, a Rapid Assessment of school infrastructure damage was carried out by MOET, Ministry of Infrastructure (MOI), and external consultants to determine the damage to all school buildings. Buildings assessed to have minor repairable damage have been prioritized by MOET for review by a local engineering consultant, who is developing works packages to enable rapid repair and return of these buildings into service.

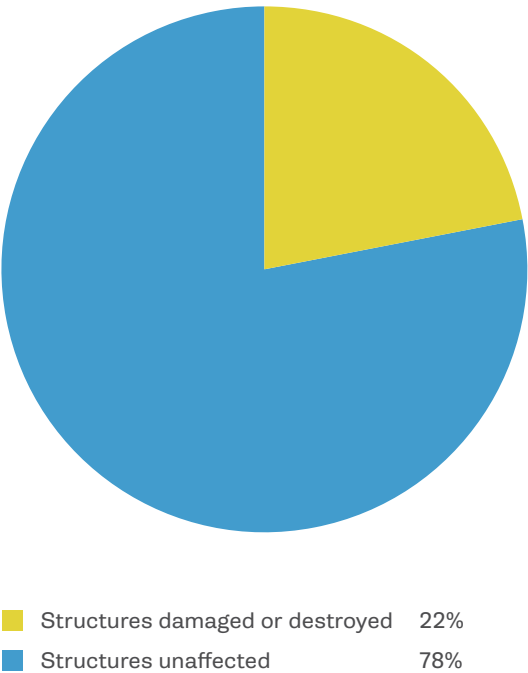
In total, 74 facilities require minor works, 24 require major works, and 11 require reconstruction of at least one classroom or building. Figure 16 shows the damage to buildings by building type. It is vital that school facilities are considered as a whole system, as all components are vital for their operation. One school surveyed had sufficient classrooms to house students, but with its water and sanitation systems destroyed and teachers’ quarters damaged, the school was forced to close and relocate students to a nearby facility.

Table 35 summarizes the damage and losses to the education sector by district, split into government and nongovernment schools. Damage assessed includes physical infrastructure (classrooms, halls, dormitories, staff quarters, water and sanitation facilities) and assets (curriculum materials, books, computers, office equipment, furniture).<sup>32</sup> Losses assessed include costs incurred for temporary school facilities, student transport to alternative nearby schools in the event that the regular school was not available, demolition and rubble removal, psychosocial support programs, fumigation of schools, and professional services associated with repair and reconstruction.

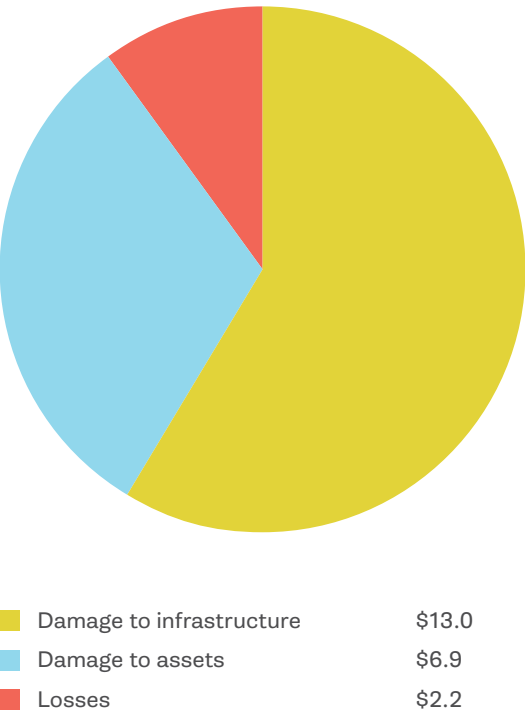
31. 349 government school buildings were inspected during the survey. Schools in need of repair and/or reconstruction have been classified as those with an asset value depreciated by more than 30 percent.

32. Asset damage costs listed are based on MOET’s Rapid Assessment only.

**FIGURE 14.**  
Impact of TC Gita on Existing School Infrastructure in Tongatapu and ‘Eua



**FIGURE 15.**  
Damage and Losses to the Education Sector in Tongatapu and ‘Eua (T\$ millions)

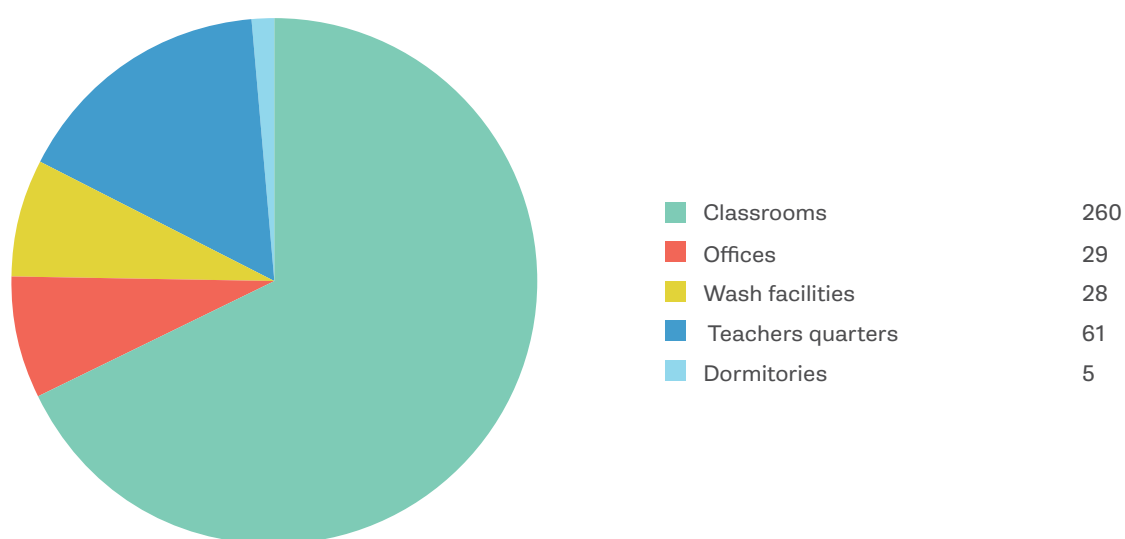






**FIGURE 16.**

Damage to School Buildings in Tongatapu and 'Eua by Building Type (number)



**TABLE 35. Damage and Losses in the Education Sector by District (T\$ millions)**

| DISTRICT      | DAMAGE       | LOSSES      | TOTAL EFFECTS | GOVERNMENT SCHOOL | NONGOVERNMENT SCHOOL |
|---------------|--------------|-------------|---------------|-------------------|----------------------|
| Kolofo'ou     | 4.80         | 0.53        | 5.33          | 1.26              | 3.95                 |
| Kolomotu'a    | 3.75         | 0.41        | 4.16          | 0.13              | 3.94                 |
| Kolovai       | 0.76         | 0.08        | 0.84          | 0.54              | 0.29                 |
| Lapaha        | 3.88         | 0.43        | 4.31          | 2.38              | 1.82                 |
| Nukunuku      | 0.46         | 0.05        | 0.51          | 0.14              | 0.36                 |
| Tatakamotonga | 1.51         | 0.17        | 1.67          | 0.23              | 1.40                 |
| Vaini         | 3.93         | 0.43        | 4.36          | 2.12              | 2.14                 |
| Eua           | 0.68         | 0.08        | 0.76          | 0.05              | 0.69                 |
| <b>TOTAL</b>  | <b>19.78</b> | <b>2.17</b> | <b>21.95</b>  | <b>6.85</b>       | <b>14.58</b>         |



#### 4.2.2.4 Recovery Strategy and Needs for the Education Sector

Given the importance of education in the community, a phased, strategic, and long-term plan for education infrastructure should be developed that addresses the MOET's immediate, short-term, and medium-term goals. Table 36–Table 38 outline the staged recovery needs for the education sector.

An immediate investment of T\$8.5 million is required to repair the existing building stock with minor damage, replace education materials and equipment, and provide support for temporary school facilities. Psychosocial support services should also be provided to assist students during the recovery.

In the short to medium term, a reconstruction and retrofitting program of T\$13.5 million is required to replace buildings with major damage and destroyed buildings. This program will require support from a qualified engineering consultant to assess the condition of existing assets, determine their suitability for retrofitting, and recommend reconstruction where appropriate. A phased approach may be employed in which existing structures are retrofitted before construction of new facilities; this will speed up the return of students to permanent school facilities.

Due to the large number of buildings that require work, a strategy should be developed that addresses potential constraints in the local labor force and material supply market, including the potential for surge pricing due to increased demand. Works may be divided into packages and/or phases and tendered to multiple contractors to deliver works rapidly. All works should employ the principles of BBB, to ensure that they are able to withstand future disasters and are designed to minimize ongoing maintenance requirements.

The high value of assets (T\$6.9 million) that were lost following TC Gita and the negative impact on students' education provide a strong case for investments to preemptively retrofit or reconstruct existing infrastructure. Relatively small investments in structural retrofitting can deliver a significant increase in building performance, making existing structures resilient to future disasters and thereby minimizing future damage, losses, and disruption. In the long term, a program to strengthen or replace the existing infrastructure should be undertaken for all education assets across the islands.

Photo: Malani Wolfgramm/World Bank. Damage to MOET Building, Nuku'alofa.





**TABLE 36. Immediate Recovery Needs in the Education Sector**

| PROGRAM OF ACTIVITY   | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY           |
|---|----------------------|------------------------------|
| Supply of curriculum materials                                | 4.4                  | MOET                         |
| Supply of education equipment, furniture, and other assets    | 2.5                  | MOET                         |
| Support for temporary school facilities (materials/transport) | 0.44                 | MOET                         |
| Psychosocial support  | 0.10                 | MOET/UNICEF                  |
| Engineering assessment of minor damaged infrastructure        | 0.10                 | MOET, engineering consultant |
| Repair of minor damage to government schools                  | 0.31                 | MOET, MOI                    |
| Repair of minor damage to nongovernment schools               | 0.62                 | MOET, MOI                    |
| <b>TOTAL</b>  | <b>8.5</b>           |                              |

**TABLE 37. Short-Term Recovery Needs in the Education Sector**

| PROGRAM OF ACTIVITY   | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY                |
|---|----------------------|-----------------------------------|
| Engineering assessment of major damaged infrastructure; supervision and program management for reconstruction | 1.5                  | MOET, MOI, engineering consultant |
| Retrofitting and reconstruction of major damaged infrastructure—PHASE 1                                       | 4.0                  | MOET, MOI                         |
| <b>TOTAL</b>  | <b>5.5</b>           |                                   |

**TABLE 38. Medium-Term Recovery Needs in the Education Sector**

| PROGRAM OF ACTIVITY   | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY |
|---|----------------------|--------------------|
| Retrofitting and reconstruction of major damaged infrastructure—PHASE 2                             | 8.0                  | MOET, MOI          |
| Preemptive retrofitting and repair of remaining school infrastructure stock not affected by TC Gita | Not yet identified   | MOET, MOI          |
| <b>TOTAL</b>  | <b>8.0</b>           |                    |

### 4.2.3 HEALTH

## Damage and losses to the health sector totaled T \$0.65 million

### 4.2.3.1 Summary

TC Gita had only minor effects on health facilities across Tongatapu and 'Eua, with damage estimated at T\$0.10 million and losses at T\$0.55 million. All facilities remained operational during and following the storm. Minor damage to roofs and water ingress from smashed windows and wind-driven rain were the predominant issues affecting health buildings. Network power cuts to the Vaiola Hospital were overcome by on-site backup generators. Power cuts affected the seven health centers outside of the capital, but all refrigerated vaccines and medications were recovered and transported to Vaiola Hospital (shown in Figure 17) before they were affected. The general public was well prepared as TC Gita approached and sought refuge in safe structures for the storm's duration. As a result, only three major injuries were directly attributable to the storm.

Prior to TC Gita, 33 cases of dengue were confirmed, and authorities were concerned that stagnant water after the storm might lead to further outbreaks. However, a widespread vector eradication program following the storm was successful in preventing the spread of disease. The incidence of gastrointestinal disease was minimized by providing communities with emergency relief kits—consisting of soap and water—and by disinfecting water tanks.

The continuous operation of health facilities is critical to protect the lives of patients and service the broader community, including during the post-disaster recovery phase. Past investments to improve the quality of health infrastructure have demonstrated the value of creating resilient assets that can withstand natural hazards. Ongoing investments are required to ensure these facilities are upgraded nationwide and maintained adequately for continuous operation into the future.

The Ministry of Health (MoH) manages the delivery of public health care services through a network of 34 maternal and child health clinics, 14 health centers, three district hospitals, and the tertiary referral hospital, Vaiola Hospital, located in Nuku'alofa (Table 39). The government is the main financier of the health system, providing close to half (47 percent) of financing in 2007/08; this is supplemented by donor and development partner funding (38 percent). An average of 10 percent of total health expenditure comes from household out-of-pocket payments (Rodney et al. 2015).

Major upgrades to the Vaiola Hospital valued at T\$66 million were completed in 2012 with support from the Japan International Cooperation Agency and World Bank (JICA 2009). Work on other hospitals and health centers since 2012 has been supported by the Australian Department of Foreign Affairs and Trade (DFAT), ADB, and the Chinese government. After TC Ian damaged the Niu'iu Hospital in Ha'apai, ADB funded the hospital's T\$4.6 million relocation to a less exposed location.

### 4.2.3.3 Assessment of Disaster Effects on the Health Sector

TC Gita had minimal impact on the health sector, with damage to infrastructure estimated at T\$0.10 million. The majority of damage was minor and affected sections of roofs and windows, with water damage to some facilities. Losses were estimated at T\$0.55 million, consisting of vector control against dengue and public education campaigns that were broadcast daily during the first three weeks of the recovery. Table 40 shows the breakdown of the damage and losses by subsector.







**TABLE 39. Health Facilities in Tonga**

|              | HOSPITAL | HEALTH CENTER | MATERNAL AND CHILD<br>HEALTH CLINIC |
|--------------|----------|---------------|-------------------------------------|
| Tongatapu    | 1        | 7             | 19                                  |
| ‘Eua         | 1        | 0             | 3                                   |
| <b>Total</b> | <b>2</b> | <b>7</b>      | <b>22</b>                           |

**TABLE 40. Damage and Losses in the Health Sector by Subsector (T\$ millions)**

| SUBSECTOR             | DAMAGE      | LOSSES      | TOTAL EFFECTS | PRIVATE<br>(PERCENTAGE<br>OF TOTAL) | PUBLIC<br>(PERCENTAGE<br>OF TOTAL) |
|-----------------------|-------------|-------------|---------------|-------------------------------------|------------------------------------|
| Health Infrastructure | 0.10        | -           | 0.10          | 0                                   | 100                                |
| Vector Control        | -           | 0.40        | 0.40          | 0                                   | 100                                |
| Education Campaign    | -           | 0.15        | 0.15          | 0                                   | 100                                |
| <b>SECTOR TOTAL</b>   | <b>0.10</b> | <b>0.55</b> | <b>0.65</b>   | <b>0</b>                            | <b>100</b>                         |

**TABLE 41. Immediate Recovery Needs in the Health Sector**

| PROGRAM OF ACTIVITY           | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY |
|-------------------------------|---------------------|--------------------|
| Repairs to damaged facilities | 0.1                 | MoH                |

**TABLE 42. Medium-Term Recovery Needs in the Health Sector**

| PROGRAM OF ACTIVITY   | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY |
|---|---------------------|--------------------|
| Preemptive structural assessment, retrofitting, and repair of remaining health infrastructure stock not affected by TC Gita | Not yet identified  | MoH, MOI           |
| Installation of backup power, water supplies, and cyclone shutters at all hospitals and health centers                      | Not yet identified  | MoH, MOI           |

< **FIGURE 17.**

Drone Image of Vaiola General Hospital Following TC Gita. The hospital maintained continuous operation throughout the storm. Photo World Bank.

#### 4.2.3.4 Recovery Strategy and Needs for the Health Sector

Due to the limited effect of TC Gita on health infrastructure, only minor works are required to return infrastructure in the affected areas to pre-cyclone condition (Table 41). The investments made in health infrastructure before TC Gita demonstrate the value of upgrading facilities so they are resilient to natural hazards and their continual operation is ensured. It is recommended that a program be developed to inspect all existing health infrastructure nationally and provide ongoing support for the maintenance of facilities. An initial detailed engineering assessment of each health facility should be undertaken to ensure that it is resilient to all potential natural hazards. Where required, preemptive retrofitting works should be carried out (Table 42). Subsequent periodic assessments of the facilities should be scheduled on a biannual basis to ensure the performance of all health facilities into the future.

Resilience could be increased at each of the 14 health centers by installing backup power generators and by upgrading water supply systems to make them self-sufficient following disasters. The installation of cyclone shutters on all facilities would also reduce the potential for smashed windows and subsequent water damage to facilities.

Photo: Malani Wolfgramm/World Bank. Repairing damaged power lines, Tongatapu.



4.3 INFRASTRUCTURE SECTORS

Damage and losses to infrastructure sectors totaled T \$28.54 million

4.3.1 ENERGY

Damage and losses to the energy sector totaled T \$17.14 million

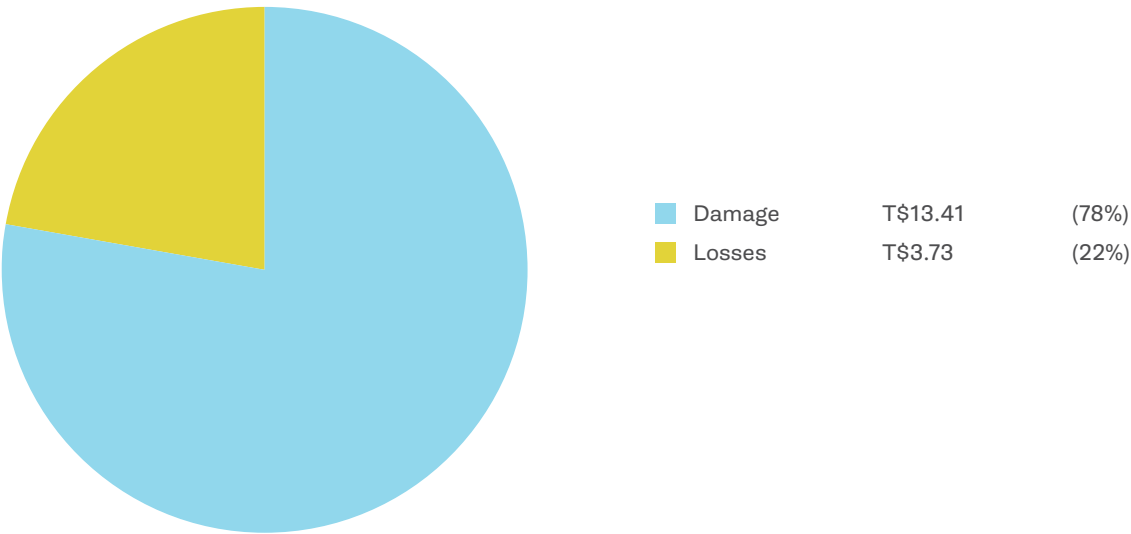
4.3.1.1 Summary

TC Gita disrupted power supply on the islands of ‘Eua and Tongatapu, affecting all Tonga Power Limited (TPL) customers in the area. The damage on ‘Eua was marginal. All customers on ‘Eua (about 1,170) were disconnected from the electricity supply, and power supply was fully reconnected 14 days after TC Gita’s landfall. On Tongatapu, the damage was and continues to be more significant, as about 17,782 customers were disconnected from the electricity supply. All of these are expected to be reconnected progressively over a seven-week period dating from the day of the cyclone as reconstruction proceeds.

While TC Gita caused significant damage to the power grid, lesser damage, estimated at about T\$615,000, was experienced in the power generation infrastructure. TPL’s diesel generation assests were quickly repaired after TC Gita’s landfall.

The total effects of TC Gita are estimated at T\$17.14 million, consisting of T\$13.41 million in damage to power sector infrastructure and T\$3.7 million in losses to TPL, mainly from loss of revenue (Figure 18).

FIGURE 18.  
Damage and Losses to Energy Sector (T\$ millions)





**TABLE 43. Percentage of Energy Assets Damaged**

|               | TONGATAPU                               |                                 |                                     |                  | 'EUA  | REMARKS                                  |
|---------------|---|---------------------------------|-------------------------------------|------------------|-------|--|
|               | OUTER VILLAGES (NOT YET UPGRADED GRIDS) | OUTER VILLAGES (UPGRADED GRIDS) | NUKU'ALOFA (NOT YET UPGRADED GRIDS) | AVERAGE OF TOTAL |       |  |
| Power Network | 45.9%                                   | 4.7%                            | 18.7%                               | 44.6%            | 12.4% |  |
| Generation    |   |                                 |                                     | 43.7%            | 19.1% | Mostly minor damage and quickly restored |

**TABLE 44. Damage by Island (T\$ millions)**

|               | TONGATAPU                               |                                 |                                     |                  | 'EUA | TOTAL        |
|---------------|---|---------------------------------|-------------------------------------|------------------|------|--------------|
|               | OUTER VILLAGES (NOT YET UPGRADED GRIDS) | OUTER VILLAGES (UPGRADED GRIDS) | NUKU'ALOFA (NOT YET UPGRADED GRIDS) | AVERAGE OF TOTAL |      |              |
| Power Network | 3.06                                    | 1.89                            | 7.76                                | 12.71            | 0.08 | <b>12.79</b> |
| Generation    |   |                                 |                                     | 0.59             | 0.03 | <b>0.62</b>  |

#### 4.3.1.2 Energy Sector Background

The Nuku'alofa energy distribution network was developed in the 1950s. Initially, households were provided with one light and one power point as a part of the electrification project. The network has expanded considerably over time, and in accordance with growth has required continual maintenance and upgrades. While power poles and lines have been upgraded at different times over the intervening years, the entire system is now in need of an upgrade to ensure greater safety and resilience, in line with standards of the infrastructure that has been upgraded most recently.

TPL, the energy provider for Tonga, is a government-owned, vertically integrated public enterprise under the oversight of the Ministry of Public Enterprises and the cabinet. TPL has the concession for and operates four independent grids: in the main islands of Tongatapu and in the Vava'u, Ha'apai, and 'Eua island groups. For these areas, TPL generates, distributes, and retails electricity and provides operation and management services.

The Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC) is the primary institutional body responsible for policy formulation, as well as for implementation of rural electrification and demand management projects for off-grid electricity services.

For Tonga as a whole, electricity consumption in 2017 is estimated at 58 GWh. Tonga is highly dependent on diesel for energy and electricity generation. Overall installed capacity is 20.2 MW, 3.7 MW (or 18 percent) of which is solar photovoltaic (PV). Most installed capacity is in Tongatapu, which is home to the main grid. The other capacity is on separate mini-grids or household systems across many islands. Renewable energy penetration is fairly limited; in 2017, only 11 percent of electricity consumption was being met by renewables.

#### 4.3.1.3 Assessment of Disaster Effects on the Energy Sector

##### Damage

Total damage to the electricity sector is estimated to be T\$13.41 million. This includes damage to TPL's generation, power network, communication, and retail assets in the islands of Tongatapu and 'Eua. Approximately 95 percent of the total damage to TPL's power network assets was on Tongatapu. A summary of the damage to assets in Tongatapu and 'Eua is shown in Table 43 and Table 44.

**Power network.** An estimated 54 percent of TPL's grid on Tongatapu had already been upgraded prior to the landfall of TC Gita under the Tonga Village Network Upgrade Project (TVNUP).<sup>33</sup> The grids that had not yet been upgraded experienced significantly greater damage than the upgraded grids. The whole 'Eua grid, including service lines that had been upgraded prior to the cyclone under the ongoing Outer Islands Renewable Energy Project (OIREP), incurred minimal damage.<sup>34</sup>

**Power generation.** TPL experienced very minor damage to its diesel and renewable energy assets in both Tongatapu and 'Eua islands. The repairs were carried out promptly following the cyclone.

##### Losses

All TPL's power systems experienced disruptions on February 12, 2018, due to TC Gita. On 'Eua, electricity supply restoration commenced on February 13, 2018, and power was fully restored within 14 days (by February 27, 2018). However, full reconnection to all customers on Tongatapu is expected to take about seven weeks, to be completed by early April 2018. Losses to TPL caused by damage in the electricity distribution network include reduced revenue from disconnection of customers lasting from February 12 to February 27 on 'Eua, and from February 12 until early April on Tongatapu. Total loss to TPL is estimated at T\$3.73 million. The loss breakdown is presented in Table 45.

33. TPL's grid on Tongatapu includes most of the 10 villages on the island's western side. The TVNUP is funded by the Government of New Zealand through MFAT.

34. OIREP is jointly funded by several development partners, including ADB, the Government of Australia, the European Union, and the Global Environment Facility. OIREP is currently administered by ADB.

**TABLE 45.** Estimated TPL Loss of Revenue from Disconnected Customers

| DISTRICT            | RESTORATION PROGRESS (%) | LOSSES (T\$ MILLIONS) |
|---------------------|--------------------------|-----------------------|
| <b>TONGATAPU</b>    |                          |                       |
| Week 1              | -                        | 1.21                  |
| Week 2              | 16.7                     | 0.92                  |
| Week 3              | 31.3                     | 0.67                  |
| Week 4              | 46.7                     | 0.46                  |
| Week 5              | 64.3                     | 0.29                  |
| Week 6              | 78.7                     | 0.15                  |
| Week 7              | 100.0                    | -                     |
| <b>'EUA</b>         |                          |                       |
| Week 1              | 30.0                     | 0.013                 |
| Week 2              | 70.0                     | 0.030                 |
| <b>SECTOR TOTAL</b> |                          | <b>3.73</b>           |

**TABLE 46.** Immediate Recovery Needs in the Energy Sector

| PROGRAM OF ACTIVITY               | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY |
|-----------------------------------|---------------------|--------------------|
| Restoration of power network      | 12.71               | TPL                |
| Restoration of generation network | 0.67                | TPL                |
| <b>TOTAL</b>                      | <b>13.38</b>        |                    |

**TABLE 47.** Medium-Term Recovery Needs in the Energy Sector

| PROGRAM OF ACTIVITY                               | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY |
|---|---------------------|--------------------|
| Restoration of the power network to BBB standards | 86.20               | TPL                |



#### 4.3.1.4 Recovery Strategy and Needs for the Energy Sector

The total cost of recovery and reconstruction for the electrical sector has been estimated. This includes (i) the cost of immediate works (about T\$13.38 million) to reestablish electricity supply to Tongatapu and 'Eua (Table 46); and (ii) medium-term disaster resilience rehabilitation of power grid infrastructure assets on Tongatapu (estimated at T\$86.20 million) to be realized under the Nuku'alofa Network Upgrade Project (NNUP) (Table 47). The total requirements for reconstruction of the system are estimated at about T\$99.58 million.

TPL's grid in the Nuku'alofa area experienced significant damage due to TC Gita. This area accounts for about 37 percent of the total customers of TPL. Both TVNUP and OIREP are success stories that demonstrate the resilience benefits of updating inefficient and aging power network infrastructure.

To respond to the need for further upgrading, the proposed NNUP will support the rehabilitation of the existing 11 kV overhead network, installation of new 11/0.4 kV distribution transformers, rehabilitation of the existing low-voltage overhead network using modern aerial-bundled conductors, and installation of new underground service cables to customer premises with new smart meters. Work will be done across five contiguous subproject areas and 56 villages in Nuku'alofa.<sup>35</sup> A key result of NNUP will be a more resilient network that experiences less damage during cyclones.

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35. The five contiguous subproject areas include (i) Kolomotu'a and Kolofo'ou; (ii) Matakī'eua, Tofoa to Fanga; (iii) Fasi, Halaleva to Ma'ufanga; (iv) Anana, Toulīki to Popua; and (v) West to Sopa.

36. Public building assets considered here include all government offices, quarters, and ministerial buildings not covered under other sector assessments. Housing, education, health, agriculture, and fisheries building assets are included in their respective sector assessments.

37. Losses incurred from demolition and removal of rubble have been captured under the transport sector analysis.

#### 4.3.2 PUBLIC BUILDINGS

### Damage and losses to public buildings totaled T \$6.47 million

##### 4.3.2.1 Summary

The impact of TC Gita on the 69 public buildings assessed<sup>36</sup> varied across the islands of 'Eua and Tongatapu, with damage to the sector totaling T\$5.47 million, 82 percent of which was infrastructure damage. The Parliament building on Tongatapu was destroyed during the cyclone and makes up 47 percent of the total infrastructure damage. Impacts to public buildings in 'Eua were significant (39 percent of total infrastructure damage), with the prison and Fire and Emergency Services buildings suffering more than 70 percent of damage on 'Eua.

Inadequate fixing of roof iron and roof structures to wall plates was the most common cause of failure across both islands. Losses to the sector are linked primarily to costs associated with the relocation of Parliament to new (temporary) premises and the required fit-out, which have been valued at T\$1.0 million. Significant additional losses from retrieval of public data/records that were damaged or lost during TC Gita, particularly from the Parliament building, are anticipated. However, these losses have not been fully quantified as of the writing of this report.<sup>37</sup>

##### 4.3.2.2 Public Buildings Sector Background

Many public buildings across Tongatapu and 'Eua were constructed in the 1970s and 1980s and were not designed to withstand cyclonic wind speeds like those of TC Gita. In the majority of buildings, maintenance and upkeep had been neglected for many years, leaving buildings especially vulnerable to the cyclone. While budget allocations exist within each ministry for routine maintenance, these have largely been insufficient to keep pace with the deterioration of the aging assets. Roof sheeting and structures were particularly vulnerable to cyclonic events, and were the most common failure mechanism across the sector.

#### 4.3.2.3 Assessment of Disaster Effects on Public Buildings

##### Damage

TC Gita impacted 69 public buildings across Tongatapu and 'Eua, with total damage to infrastructure assessed at T\$4.47 million (Table 48).

Tonga's Parliament building, built in 1892, was destroyed during TC Gita, with damage valued at T\$2.1 million. Damage to contents of the Parliament building has been estimated at T\$1 million.

The Tonga Police, HM Armed Forces, and Fire and Emergency Services facilities across Tongatapu were also badly impacted, with damage totaling T\$0.5 million; almost half of this amount was incurred at His Majesty's Navy Base in Ma'ufanga (Kolofo'ou). Combined with the destruction of the Parliament building, the damage to the Tonga Police, HM Armed Forces, and Fire and Emergency Services facilities makes up 87 percent of total damage on Tongatapu. While damage to the 13 government quarters across Tongatapu was not significant (T\$0.1 million), the assessment identified these aging assets to be in particularly poor condition. All 13 quarters were identified as having asbestos roof sheeting that is in urgent need of removal and suitable replacement.

Damage to government buildings in 'Eua was significant and accounts for 33 percent of the total damage. Fire services assets were particularly hard hit, with the fire station, office, and workshop all destroyed, at a cost of T\$0.5 million. The prison staff quarters and workshop were also destroyed, and there was major damage to both the prison office and inmate quarters. Damage to building contents has not been established as of the writing of this report.

##### Losses

Losses to the sector are linked primarily to costs associated with the relocation of Parliament to new (temporary) premises and the associated fit-out that was required to allow Parliament to resume. These losses have been valued at T\$1.0 million.

A number of public records have been lost with the destruction of the historic Parliament building, but these losses have not been fully quantified as of the writing of this report. Losses of approximately T\$0.1 million have also been incurred from the relocation of the Immigration Office and Public Commission Service due to damage resulting from TC Gita.

**TABLE 48. Damage and Losses in the Public Buildings Sector (T\$ millions)**

| SUBSECTOR  | DAMAGE      | LOSSES     | TOTAL EFFECTS |
|--|-------------|------------|---------------|
| Tonga Police, HM Armed Forces, and Fire and Emergency Services | 1.00        | -          | 1.00          |
| Government Offices   | 0.43        | -          | 0.43          |
| Government Quarters  | 0.14        | -          | 0.14          |
| Detention facilities   | 0.52        | -          | 0.52          |
| Parliament and King's Residences <sup>a</sup>                  | 3.18        | 1.0        | 4.18          |
| Other <sup>b</sup>   | 0.20        | -          | 0.20          |
| <b>SECTOR TOTAL</b>  | <b>5.47</b> | <b>1.0</b> | <b>6.47</b>   |

a. The king's residence in 'Eua sustained major roofing damage. No damage to the Tongatapu residence has been reported.

b. Other buildings include sheds, storage facilities, workshops, and ancillary buildings.

#### 4.3.2.4 Recovery Strategy and Needs for Public Buildings

Damage to public buildings can mainly be attributed to poor maintenance, aging assets, and inadequate fixing of roof sheeting and substructures. These shortcomings across all public building types will need to be addressed strategically in both the short and long term. Immediate roofing repairs are ongoing. However, a detailed assessment of recovery needs and forward planning is required to ensure that resilient retrofitting designs can be implemented as appropriate. Adequate investment in maintenance planning and budgeting is also required to mitigate further rapid deterioration of the already aging assets. Cleanup of partially damaged buildings is an immediate priority and must be expedited to reduce the risk of further damage and of injury to occupants and the public.

Additional detailed survey and damage assessments of the 18 significantly damaged buildings across both islands will need to be carried out to better understand the structural integrity of the structures and their suitability for repair and retrofit. With a significant percentage of the major damage occurring in the Tonga Police, HM Armed Forces, and Fire and Emergency Services subsector, adequate funding and a strategic approach for building the resilience of this infrastructure in particular will be required to ensure the subsector has the capacity to carry out its vital public service roles.

A rapid survey and assessment of all public buildings across Tonga is urgently required so that a geolocated register of public building assets can be developed to serve as tool for improved maintenance programming. Currently no such register exists, and it is unclear exactly how many public buildings Tonga has and what condition they are in. Understanding the full extent of the economic impact to the sector from events such as TC Gita is not possible without this information, and this activity should therefore be prioritized. Improved routine maintenance of those buildings unaffected by TC Gita will be important to mitigate further damage and losses from the aging building stock, now and in the future.

The assessment of government quarters on Tongatapu identified 13 houses that still have asbestos roof sheeting at various stages of deterioration. The assessment noted that the houses themselves are in particularly poor condition and require substantial renovations. Removal and correct disposal of the asbestos and upgrade of the roofing structure should be carried out as soon as possible to mitigate any health and safety risks (Table 49).

The medium-term recovery needs of the sector (Table 51) depend heavily on the findings of a more detailed survey of public buildings across Tonga that would allow the needs of the sector to be properly understood and prioritized. With many of the significantly damaged buildings likely reaching the end of their serviceable life, the cost to the government to retrofit or replace all of these assets and to rebuild those destroyed by TC Gita to resilient standards will be extremely high. These costs, however, cannot be quantified at the time of writing, as more detailed information on the building stock condition and priorities of the government must first be established. The medium-term recovery needs (Table 51) only account for the replacement of the known public building assets and are likely to increase in response to the findings of the more detailed survey and damage assessment (Table 50).



Photo: Malani Wolfgramm/World Bank.  
Rubble from Parliament Building, Nuku'alofa.



**TABLE 49. Immediate Recovery Needs in the Public Buildings Sector**

| PROGRAM OF ACTIVITY                                   | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY |
|---|---------------------|--------------------|
| Emergency and minor repairs across Tongatapu and 'Eua | 0.31                | MOI                |

**TABLE 50. Short-Term Needs in the Public Buildings Sector**

| PROGRAM OF ACTIVITY                                       | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY  |
|---|---------------------|---|
| Survey and damage assessments of assets with major damage | 0.05                | MOI   |
| Total public building survey and register development     | 0.05                | MOI, Ministry of Lands, Survey and Natural Resources      |
| Asbestos roof removal and replacement                     | 0.6                 | MOI with assistance from certified asbestos-handling firm |
| <b>TOTAL</b>  | <b>0.7</b>          |   |

**TABLE 51. Medium-Term Needs in the Public Buildings Sector**

| PROGRAM OF ACTIVITY                                  | VALUE (T\$ MILLION) | RESPONSIBLE AGENCY |
|--|---------------------|--------------------|
| Estimated replacement cost of public building assets | 5.15 <sup>38</sup>  | MOI                |
| <b>TOTAL</b>   | <b>5.15</b>         |                    |

38. The total number of public building assets is not currently understood so this is a preliminary/tentative estimate. This is the estimated replacement costs of the known public building assets at the time the report was written that suffered major damage or were destroyed.

### 4.3.3 TRANSPORT

## Damage and losses to the transport sector totaled T \$3.08 million

#### 4.3.3.1 Summary

Tonga's transport infrastructure and networks across the three subsectors (land, maritime, and aviation) suffered only minor damage from TC Gita. Damage was concentrated in central Nuku'alofa (Kolofo'ou district) and the Tatakamotonga district, where port and airport operations are based respectively. The transport sector incurred minor losses from lost revenue from cancelled flights and cruises, and from salvaging of sunken vessels and damaged assets. Damage (T\$2.3 million) and losses (T\$0.8 million) to the sector constitute only 1 percent of total damage and losses from the cyclone.

#### 4.3.3.2 Transport Sector Background

The country's transport sector, including land, maritime, and aviation subsectors, plays a vital role in the Tongan economy and community, and contributes approximately 7 percent to Tonga's GDP. The sector provides critical mobility services that support tourism, inter-island and international commerce, and inter-island travel for social, educational, and medical needs.

The maritime subsector includes operations from the multipurpose (cargo and passenger) Queen Salote Wharf (serving international and domestic shipping) in central Nuku'alofa (Kolofo'ou district), which is managed and operated by the state-owned Ports Authority Tonga (PAT). The Ministry of Infrastructure manages all other ports throughout Tonga. Although the port system meets basic needs for coverage, capacity, and compliance, the standard of infrastructure has suffered from insufficient investment in core infrastructure and facilities, and from emphasis on maintenance of outer island ports and channels. Over the past few years (FY2013/14 to FY2016/17), PAT has invested more than T\$10 million in upgrading the ports infrastructure, but more capital investment is required to further upgrade and maintain high standards of operation and safety.

Tonga Airports Limited (TAL), a public enterprise of the Government of Tonga, operates and manages six airports throughout the country. The existing commercial airports provide sufficient coverage to all island groups, and at this stage, there are no plans to build any additional airports. The airports have sufficient capacity for expected growth in passenger demand, but the length and current condition of runways place limits on the operation of larger aircraft.

Much of the infrastructure is either nearing the end of its useful life or requires upgrading to continue to meet international and national safety and security standards. TAL is currently managing an important investment program that focuses on meeting safety and security compliance requirements for fire and rescue capability, security screening, navigational aids, and runway condition improvements.<sup>39</sup>

The Land Transport Division within MOI is responsible for managing Tonga's land transport system. The road network in Tonga comprises approximately 880 km of roadways (including community roads), of which 40 percent are sealed (Government of Tonga 2013). This network provides good connectivity to communities, but in some areas the condition of roads has deteriorated significantly due to insufficient emphasis on maintenance.

Recognizing the key role that transport plays in the economy and social fabric of Tonga (given its isolated and dispersed nature), the Government of Tonga is committed to improving the efficiency of the sector, as highlighted in Tonga's National Infrastructure Investment Plan 2013–2023. Since 2004, the government's transport policy has been strengthened, and road maintenance, maritime and aviation safety, and infrastructure have improved. This progress has occurred through targeted programs such as the Tonga Transport Sector Review and the Tonga Transport Sector Consolidation Project,<sup>40</sup> and with support from development partners, including the World Bank, ADB, Australian government, and Pacific Region Infrastructure Facility.

#### 4.3.3.3 Assessment of Disaster Effects on the Transport Sector

##### Damage

Table 52 and Table 53 summarize the cost of damage to transport infrastructure and the value of the losses incurred due to TC Gita. The cost of the damage is taken to be the cost of repairing or replacing the structures to their pre-disaster state.

**Maritime subsector.** Maritime damage was concentrated in PAT'S wharf compound in the Kolofo'ou district. The docks, wharfs, and associated infrastructure<sup>41</sup> sustained more than two-thirds of these effects, primarily as a result the strong winds and the condition of the numerous aging offices, warehouses, and multipurpose (commercially leased) assets that have suffered from 30 years of saltwater exposure. Damage to navigational aids, surfacing, and rock revetment at the international wharf was minor, while damage to fencing throughout the PAT-managed area was widespread.

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39. The program is funded by the World Bank.

40. Both projects are funded by the World Bank.

41. Associated infrastructure includes a range of structures, such as office buildings, warehouses, and storage facilities that provide direct support to wharf and dock operations.

The domestic wharves went back into operation on February 15, 2018, and the Queen Salote international wharf was reopened on February 19, 2018. The first cruise ship to visit Nuku'alofa following TC Gita arrived on March 10, 2018. Total damage to the maritime subsector has been estimated at T\$1.3 million, equating to approximately 6 percent of total insured assets. It is anticipated that approximately 70 percent of this damage will be covered by PAT's insurance.

**Aviation subsector.** Both the international and domestic operations of the airport in Fua'amotu village in the Tatakamotonga district ceased for just 24 hours following TC Gita, and resumed on February 14 to receive the first international post-disaster support. The entire roof structure of the passenger terminal at the domestic terminal building was destroyed and makes up the majority of the total damage to the subsector, valued at T\$0.93 million. Impacts to Fua'amotu International terminal were minor, and included damage to roof sheeting, the internal ceiling lining, navigational aids, and lighting.

**Land subsector.** Tonga's land transport infrastructure was largely unaffected by Tropical Cyclone Gita, with only very minor damage identified to road signage and stockyard sheds, totaling T\$52,000.

## Losses

The assessed losses to the transport sector are summarized by subsector below and in Table 52 and Table 53 .

**Maritime subsector.** Losses for the maritime subsector of T\$0.48 million resulted primarily from loss of berthing fees from cancelled international cruise ships, waived port fees,<sup>42</sup> increased operational costs arising from salvaging of damaged watercraft, and risk reduction investigative measures to ensure the structural integrity of PAT's infrastructure. Losses in revenue have also been incurred from reduced rental income from damaged and destroyed office buildings and commercial lease properties.

**Aviation subsector.** Aviation sector losses, valued at T\$0.10 million, resulted from lost revenue from cancelled international flights (via taxes and landing fees) and increased operational costs associated with debris cleanup. Domestic operations have resumed and continue out of the international terminal, which has mitigated further losses to the subsector.

**Land subsector.** The losses to the land subsector were minor and resulted from increased operational costs associated with debris clearing across Tongatapu and 'Eua. Fuel costs for MOI and army heavy machinery (dump trucks, loaders), which were mobilized for the cleanup, were T\$102,000. Additionally, one contractor already under contract with the MOI Land Transport Division (MOI) for routine maintenance was also drafted to assist in the cleanup, at a cost of T\$49,000 thousand.

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42. Port fees for imported cargo will be waived for food (for six months) and construction materials (for two years) as a post-TC Gita recovery support mechanism.

Photo: Malani Wolfgramm/World Bank. Aerial view of Fuaa Wharf, Nuku'alofa.





**TABLE 52. Damage and Losses in the Transport Sector by Subsector (T\$ millions)**

| SUBSECTOR           | DAMAGE      | LOSSES      | TOTAL EFFECTS |
|---------------------|-------------|-------------|---------------|
| Maritime            | 1.34        | 0.48        | 1.81          |
| Aviation            | 0.93        | 0.11        | 1.03          |
| Land                | 0.05        | 0.17        | 0.22          |
| <b>SECTOR TOTAL</b> | <b>2.32</b> | <b>0.76</b> | <b>3.08</b>   |

**TABLE 53. Damage and Losses in the Transport Sector by District (T\$ millions)**

| DISTRICT            | DAMAGE      | LOSSES      | TOTAL EFFECTS | PRIVATE<br>(PERCENTAGE<br>OF TOTAL) | PUBLIC<br>(PERCENTAGE<br>OF TOTAL) |
|---------------------|-------------|-------------|---------------|-------------------------------------|------------------------------------|
| Kolofo'ou           | 1.36        | 0.57        | 1.81          |                                     | 100                                |
| Kolomotu'a          | 0.03        | 0.09        | 0.13          |                                     | 100                                |
| Tatakamotonga       | 0.94        | 0.10        | 1.03          |                                     | 100                                |
| <b>SECTOR TOTAL</b> | <b>2.32</b> | <b>0.76</b> | <b>3.08</b>   |                                     | <b>100</b>                         |

Note: The assessment did not disaggregate land subsector damage and losses (T\$0.22 million) by district; for the purpose of this table, they were evenly distributed between Kolofo'ou and Kolomotu districts, the location of Nuku'alofa's central and densest road networks.

Photo: Malani Wolfgramm/World Bank. Damage to the domestic airport terminal.



#### 4.3.3.4 Recovery Strategy and Needs for the Transport Sector

**Maritime subsector.** Prior to TC Gita, the government recognized the need for investment in Tonga's ports to build resilience to the impacts of natural disasters and ensure continuity of services, and this focus will continue through the recovery stages. PAT has invested more T\$10 million over the past few years (FY2013/14 to FY2016/17) to upgrade the port infrastructure, but more capital investment and financial support will be required to upgrade core infrastructure and facilities and build the resilience of Tonga's ports to cyclones and other natural hazards. The majority of Tonga's trade comes through the ports of Nuku'alofa, so it is critical that these services are protected. Consequently, reconstruction of critical assets to withstand Category 5 cyclones is the goal of PAT and the government. PAT will fund capital investments to maintain port infrastructure to current standards, but there is currently a financing gap for activities that would improve the resilience of core infrastructure and facilities and ensure high standards of operation and safety into the future.

In the immediate term, the recovery needs will be focused on emergency repairs to fencing and minor infrastructure damage to allow port operations to resume to pre-cyclone conditions (Table 54). Widely damaged fencing must be replaced at the international wharf to ensure compliance with International Ship and Port Facility Security (ISPS) standards. Repair of rock revetment and public facilities, conduct of structural integrity surveys, and replacement of floodlights, navigational aids, and fenders throughout Queen Salote domestic and international berths are also high priorities in the immediate term. Immediate temporary repairs to buildings critical for operations of the port are ongoing, with approximately 80 percent already completed at the time of this assessment.

The short- to medium-term recovery needs (Table 55, Table 56) include the reinstatement of damaged assets to the pre-cyclone condition as well as upgrading of critical operational infrastructure assets in accordance with BBB principles; the goal is to increase the resilience of the sector to future cyclone and other hazard events. It is anticipated that ongoing development investment programs, such as the Maritime Safety and Resilience Program and the Transport Sector Consolidation Project, will incorporate such principles in all designs. Critical assets for port operations and shipping, including the FISA Building, Teisina, Waratah, and the Export Culture Co. Building, will require significant upgrades to ensure the continuity of services in the medium to long term. Along with the flea market, these buildings are also an important source of rental income for PAT, so it is vital that they are safeguarded against future impacts from natural hazards.

**Aviation subsector.** Immediate needs of the aviation subsector include replacement of destroyed navigational aids, communication systems, lighting, and computers and other office equipment (Table 54). Replacement of the roof sheeting and internal ceiling in the damaged areas of the Fua'amotu International Airport building is also a priority. Replacement of critical aircraft surveillance technology, as well as restoration of the Royal VIP lounge adjacent to the international terminal, has already been completed at a cost of T\$94,000. Short-term recovery of the aviation subsector will focus on reconstruction of the domestic terminal (Table 55).<sup>43</sup> At the time of this report, planning for the reconstruction and upgrade of the terminal is under way and expected to be implemented over the next 12–18 months.

**Land subsector.** Recovery needs from TC Gita for the land transport subsector are minor and limited to road signage replacement across Tongatapu and 'Eua in the immediate term (Table 54).<sup>44</sup>

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43. Medium-term priority development needs for the aviation subsector, such as construction of the new control tower at Fua'amotu International Airport and resurfacing works in Ha'apai, are already being met by ongoing development projects and are not covered by this assessment.

44. Short- and medium-term land subsector priority development needs, such as road rehabilitation and upgrading programs, are being already addressed by the government through several projects in association with development partners and are not considered by this assessment as a recovery need from TC Gita.

**TABLE 54. Immediate Term Recovery Needs in the Transport Sector**

| SUBSECTOR    | PROGRAM OF ACTIVITY  | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY            |
|--------------|--|----------------------|-------------------------------|
| Maritime     | Fencing repairs, navigational aid and floodlight replacement, engineering services, emergency building repairs | 0.4                  | PAT                           |
| Aviation     | Navigational aids, communication systems, lighting, and international terminal roofing repairs                 | 0.23                 | TAL                           |
| Land         | Road signage repair and replacement  | 0.05                 | MOI (Land Transport Division) |
| <b>TOTAL</b> |  | <b>0.68</b>          |                               |

**TABLE 55. Short-Term Recovery Needs in the Transport Sector**

| SUBSECTOR    | PROGRAM OF ACTIVITY   | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY |
|--------------|---|----------------------|--------------------|
| Maritime     | Upgrading and climate proofing of PAT head office, flea market, passenger terminals, and critical operations support assets | 0.9                  | PAT                |
| Aviation     | Reconstruction of domestic terminal   | 0.68                 | TAL                |
| <b>TOTAL</b> |   | <b>1.58</b>          |                    |

**TABLE 56. Medium-Term Recovery Needs in the Transport Sector**

| SUBSECTOR | PROGRAM OF ACTIVITY                              | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY |
|-----------|--|----------------------|--------------------|
| Maritime  | Upgrade and climate proofing of remaining assets | 0.88                 | PAT                |



#### 4.3.4 WATER AND SANITATION

### Damage and losses to the water and sanitation sector totaled T \$1.85 million

#### 4.3.4.1 Summary

**Water.** The total effect of TC Gita on the water subsector was T\$1.28 million. The total damage to water infrastructure was estimated at T\$1 million, comprising T\$0.15 million in damage to urban water infrastructure and T\$0.85 million for rural water infrastructure. Losses equate to T\$0.28 million, comprising T\$0.12 for urban infrastructure and T\$0.16 for rural infrastructure. Recovery needs for the water sector are estimated at T\$1.8, with T\$0.27 required to restore urban water infrastructure to pre-cyclone levels and T\$1.58 million required to restore and reconstruct village water systems.

**Sanitation.** TC Gita caused minimal damage to sanitation facilities. The total damage to the urban sanitation infrastructure was estimated at T\$0.26 million. There is no additional cost for rural sanitation, as it uses the same infrastructure as the urban services. It is expected that approximately T\$0.49 million will be needed for the urban sanitation management infrastructure to recover to pre-cyclone levels. Reconstructed urban sanitation services will again provide for rural sanitation services.

#### 4.3.4.2 Water Sector Background

**Water.** The Tonga Water Board (TWB) is a 100 percent government-owned public enterprise that is responsible for production, storage, treatment (chlorination), transmission, distribution, and retail of water in the Greater Nuku'alofa area. TWB operates two adjacent borefields at Mataki'eua and Tongamai, six water storage reservoirs, a manual chlorine dosing system, and a water-distribution piped network (180 km) throughout Nuku'alofa, with around 6,500 connections serving approximately 28,000 residents. During the 12-month period from July 2016 to June 2017, TWB produced some 3.4 million m<sup>3</sup> of water, with system losses of approximately 45 percent. Over the same period, TWB had total water sales revenue of more than T\$10 million in the Nuku'alofa urban area.

The Ministry of Health and Village Water Committees (VWC) provide and manage water supply services to all rural villages on Tongatapu and 'Eua through provision of water production boreholes, borehole pumping units (usually diesel powered or electric and usually consisting of one production pump with a 100 percent standby pump), standby generators, elevated water storage (usually on a 15 m stand with one operating reservoir and one 100 percent standby reservoir), and a gravity-fed village reticulation piped water supply network reaching all household consumers. Many connections are now metered.

**Sanitation.** Tonga Waste Authority Ltd. (WAL) is a 100 percent government-owned public enterprise that is responsible for collection, transport, and safe disposal of household solid waste and the disposal of commercial solid waste across all urban and rural villages on the island of Tongatapu. These wastes are safely disposed of at the Tapuhia Waste Management Facility (TWMF) located on Tongatapu Island. WAL operates a fleet of eight waste collection trucks (four compactor trucks and four flatbed trucks), landfill compactor and loader, and wastewater treatment plant. WAL also has responsibility for the collection and treatment of liquid wastes from urban and rural households, institutions, and commercial enterprises. It operates two 4,500 liter septic pump-out trucks that deposit the waste into septage drying beds located at the TWMF. The sludge drained is then treated in the adjacent wastewater treatment plant.

In the 2016/17 financial year, WAL had total waste management sales revenue of around T\$3.5 million for all households, government institutions, and commercial enterprises across Tongatapu.

#### 4.3.4.3 Assessment of Disaster Effects on the Water Sector

##### Damage

**Water.** The total damage to the water supply subsector is estimated at T\$1.93 million, predominantly related to the rural village water supply schemes. Major damage was caused to MoH/VWC rural village water supply sector assets. Assets found to be damaged include 20 borehole pumping units, 25 water storage tanks (elevated water storages) and tank stands, and 20 village water distribution pipework systems (which suffered breakages).

Damage to the urban water supply system (estimated at T\$0.15 million) was limited to destruction of TWB's standby generator shed, electricity supply issues with a number of borehole pump motors and electric control panels, damage to approximately 1 km of security fencing at the production borefield, and around 300 breakages in distribution pipework and consumer connections.

**Sanitation.** The total damage to the sanitation subsector is estimated at T\$0.26 million. All of this damage occurred at the TWMF, where the mechanical servicing and vehicle/spare parts storage shed collapsed and was totally destroyed (T\$0.23 million). Further minor damage occurred to the roofing system for the septage drying beds (T\$0.03 million).

### Losses

Total losses for the water supply and sanitation sector are estimated to be T\$0.59 million.

**Water.** TWB's urban water supply system experienced disruptions on February 12–13, 2018. Water supply operations switched to the standby power source on February 13, 2018, with regular service restored to an estimated 75 percent of TWB's customers within 24 hours; within four days an estimated 100 percent of the pre-cyclone demand was being supplied. Full reconnection to all customers is anticipated by June–July 2018.

Losses for TWB and MoH/VWCs from TC Gita include the following:

- Reduced revenue from loss of customers between February 12, 2018, and June–July 2018 (when full reconnection is anticipated) due to damage to customers' houses that rendered them unfit for habitation; and
- Higher operational costs from temporary reliance on standby generators in the production borefields (urban—two days; rural—three months).

**TABLE 57. Damage, Losses, and Recovery Needs for the Water Subsector (T\$ millions)**

| DESCRIPTION                    | DAMAGE      | LOSSES      | RECOVERY NEEDS |
|--------------------------------|-------------|-------------|----------------|
| Urban Water                    | 0.15        | 0.12        | 0.27           |
| Rural Water                    | 0.85        | 0.16        | 1.58           |
| <b>TOTAL URBAN &amp; RURAL</b> | <b>1.00</b> | <b>0.28</b> | <b>1.85</b>    |

**TABLE 58. Damage, Losses, and Recovery Needs for the Sanitation Subsector (T\$ millions)**

| DESCRIPTION                    | DAMAGE      | LOSSES      | RECOVERY NEEDS |
|--------------------------------|-------------|-------------|----------------|
| Urban Sanitation               | 0.26        | 0.17        | 0.49           |
| Rural Sanitation               | 0.00        | 0.14        | 0.00           |
| <b>TOTAL URBAN &amp; RURAL</b> | <b>0.26</b> | <b>0.31</b> | <b>0.49</b>    |

**Sanitation.** Sanitation losses are relatively minor, as services to householders were interrupted for less than one week. Losses for WAL stem from

- Increased level of service and higher operational costs required for at least two months to collect, transport, and dispose of building debris and damaged household goods in both urban and rural areas of Tongatapu;
- Increased level of service and higher operational costs required for at least two months to process and remove large amounts of green waste for households across Tongatapu (service will utilize WAL's green waste-chipping units);
- Disruption of governance and social processes; and
- Increased risks and vulnerabilities.

#### 4.3.4.4 Recovery Strategy and Needs for the Water Sector

To improve system resilience, TWB, WAL, and MoH/VWCs may update and increase the cyclone design specification rating for key assets during short- to medium-term reconstruction. This will include a review of the wind loadings and a possible move to Category 5 cyclone rating for key buildings and structures, including elevated tank stands, high-voltage power distribution lines, pump and generator plant houses, sheds and vehicle/parts storage structures, and solar system components.

**TABLE 59. Damage and Losses in the Water and Sanitation Sector by Subsector (T\$ millions)**

| SUBSECTOR           | DAMAGE      | LOSSES      | TOTAL EFFECTS | PRIVATE (PERCENTAGE OF TOTAL) | PUBLIC (PERCENTAGE OF TOTAL) |
|---------------------|-------------|-------------|---------------|-------------------------------|------------------------------|
| Water               | 1.0         | 0.28        | 1.28          | 79% <sup>45</sup>             | 21%                          |
| Sanitation          | 0.26        | 0.31        | 0.57          | 0                             | 100%                         |
| <b>SECTOR TOTAL</b> | <b>1.26</b> | <b>0.59</b> | <b>1.85</b>   |                               |                              |

45. While TWB is responsible for water supply in the Greater Nuku'alofa area, water supplies in the rural area are managed and operated by Village Water Committees (VWC). The VWC provide services and collect levies for their respective areas. Water supply operations managed by VWC are classified as private in this Assessment.

**TABLE 60. Damage and Losses in the Water and Sanitation Sector by District (T\$ millions)**

| DISTRICT            | DAMAGE      | LOSSES      | TOTAL EFFECTS | PRIVATE (PERCENTAGE OF TOTAL) | PUBLIC (PERCENTAGE OF TOTAL) |
|---------------------|-------------|-------------|---------------|-------------------------------|------------------------------|
| Kolofo'ou           | 0.20        | 0.15        | 0.35          | 0                             | 100                          |
| Kolomotu'a          | 0.21        | 0.14        | 0.35          | 0                             | 100                          |
| Vaini               | 0.20        | 0.06        | 0.26          | 100                           | 0                            |
| Tatakamotonga       | 0.12        | 0.06        | 0.18          | 100                           | 0                            |
| Lapaha              | 0.08        | 0.06        | 0.14          | 100                           | 0                            |
| Nukunuku            | 0.43        | 0.06        | 0.49          | 100                           | 0                            |
| Kolovai             | 0.02        | 0.06        | 0.08          | 100                           | 0                            |
| <b>SECTOR TOTAL</b> | <b>1.26</b> | <b>0.59</b> | <b>1.85</b>   | <b>100</b>                    |                              |



Undergrounding of key power distribution lines is one approach to improve disaster resilience for cyclone events. Tonga Power Limited and TWB already have in place a practice of undergrounding key low-voltage transmission and distribution assets in the production borefield areas. However, TPL does not presently underground high-voltage reticulation. Although reconstruction following TC Gita will not include any additional immediate undergrounding of subtransmission and distribution assets for the water sector, TPL and TWB will continue to include undergrounding in future development plans to maximize system resilience.

Key needs for the recovery and reconstruction of the water supply and sanitation sector include

- Immediate works to reestablish, as soon as possible, full water supply capacity and service for all rural village households and consumers (Table 61);
- Short-term reconstruction works (Table 62); and
- Improved disaster resilience design of key/critical infrastructure assets for medium-term and long-term reconstruction works.

The total requirements for reconstruction of all water supply and sanitation services for urban and rural consumers are estimated to be T\$2.3 million.

**TABLE 61. Immediate Recovery Needs in the Water and Sanitation Sector**

| SUBSECTOR | PROGRAM OF ACTIVITY                                       | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY      |
|-----------|---|----------------------|-------------------------|
| Water     | Restore village systems that are nearly 100% unproductive | 1.24                 | Ministry of Health, TWB |

**TABLE 62. Short-Term Recovery Needs in the Water and Sanitation Sector**

| SUBSECTOR    | PROGRAM OF ACTIVITY               | VALUE (T\$ MILLIONS) | RESPONSIBLE AGENCY      |
|--------------|-----------------------------------|----------------------|-------------------------|
| Water        | Restore partially damaged systems | 0.62                 | Ministry of Health, TWB |
| Sanitation   | Repair TWMF infrastructure        | 0.48                 | Waste Authority Ltd.    |
| <b>TOTAL</b> |                                   | <b>1.10</b>          |                         |









# DISASTER RISK MANAGEMENT: EARLY WARNING AND PREPAREDNESS FOR TC GITA

## 5.1 DISASTER RISK MANAGEMENT SECTOR BACKGROUND

The Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications in Tonga has an overarching focus on climate resilience and disaster risk management (DRM) for Tonga. MEIDECC houses key institutions that are responsible for providing early warnings of and response to meteorological, hydrological, and geophysical hazards. It also works closely with the Ministry of Lands, Survey and Natural Resources (MLSNR). The core elements of Tonga's system for natural hazard forecast, warning, and response are the following three agencies:

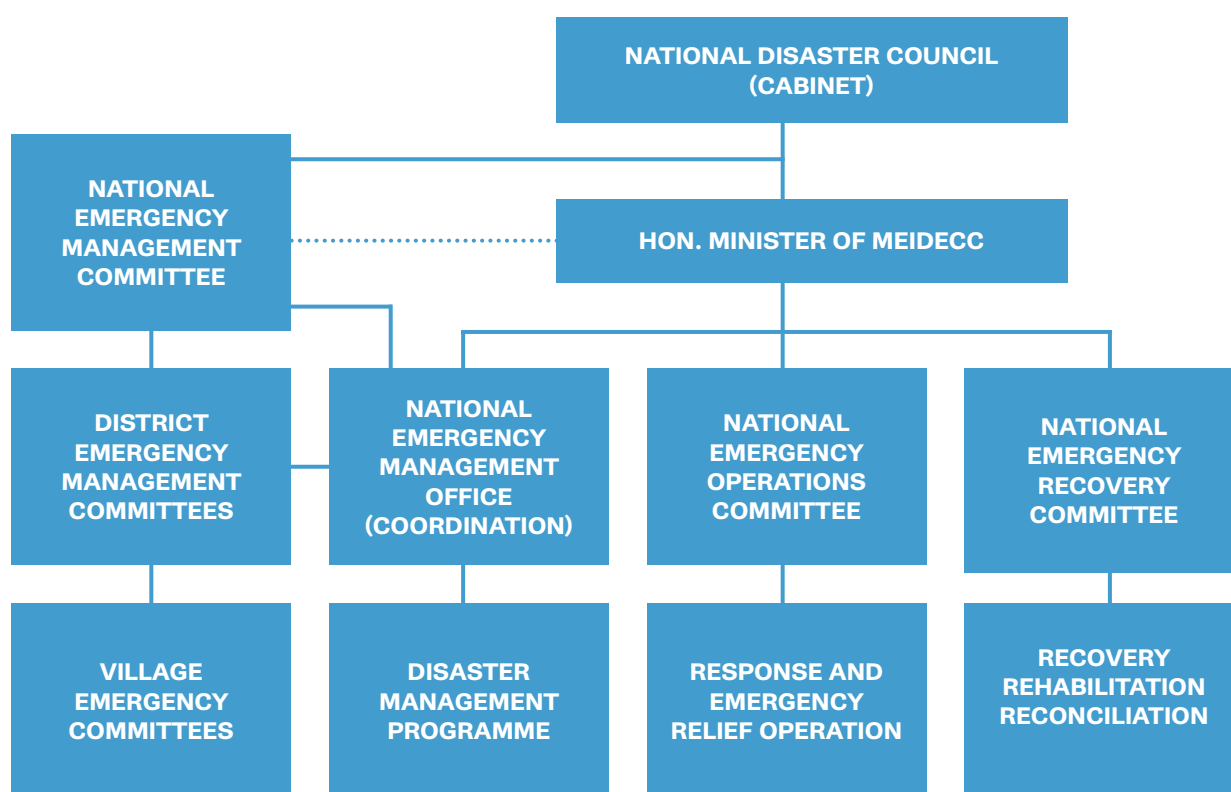
- **Tonga Meteorological Service**, which is housed in MEIDECC, provides weather and climate services, and is the national authority for issuing meteorological and geophysical hazard warnings.
- **National Emergency Management Office** (NEMO), which is also housed in MEIDECC and which was established under the Emergency Management Act (2007), is responsible for managing emergency situations.
- **Natural Resources Division** (NRD), which is housed in MLSNR, is responsible for earthquake monitoring, mapping, vulnerability assessments, and other related activities, and shares responsibility for hydrological and geophysical warning services with Tonga Meteorological Service.

Figure 19 illustrates the structure of emergency management in Tonga as defined by the Emergency Management Act (2007). This law determines the governance and institutional arrangements for DRM in Tonga and the associated operational systems and processes.



**FIGURE 19.**

## National Disaster Management Structure



## 5.2 PERFORMANCE OF THE TONGA DRM SYSTEM DURING TC GITA

### 5.2.1 TROPICAL CYCLONE FORECASTING

The Fua'amotu Tropical Cyclone Warning Centre (FTWC) was activated on the evening of February 10, 2018, when TC Gita was upgraded to severe tropical cyclone status and was located about 560 km east-southeast of Niuatoputapu. Despite suffering damage during the storm, FTWC remained operational and continued to provide manual support and radio updates to the public based on weather observations and barometer readings. A total of 22 tropical cyclone advisories were issued for Tonga for TC Gita, with 17 issued by the FTWC and the final five issued by Regional Specialized Meteorological Centre (RSMC) Nadi.<sup>46</sup>

46. MEIDECC, "Tropical Cyclone Gita Meteorological Report," February 23, 2018.

47. Ibid.

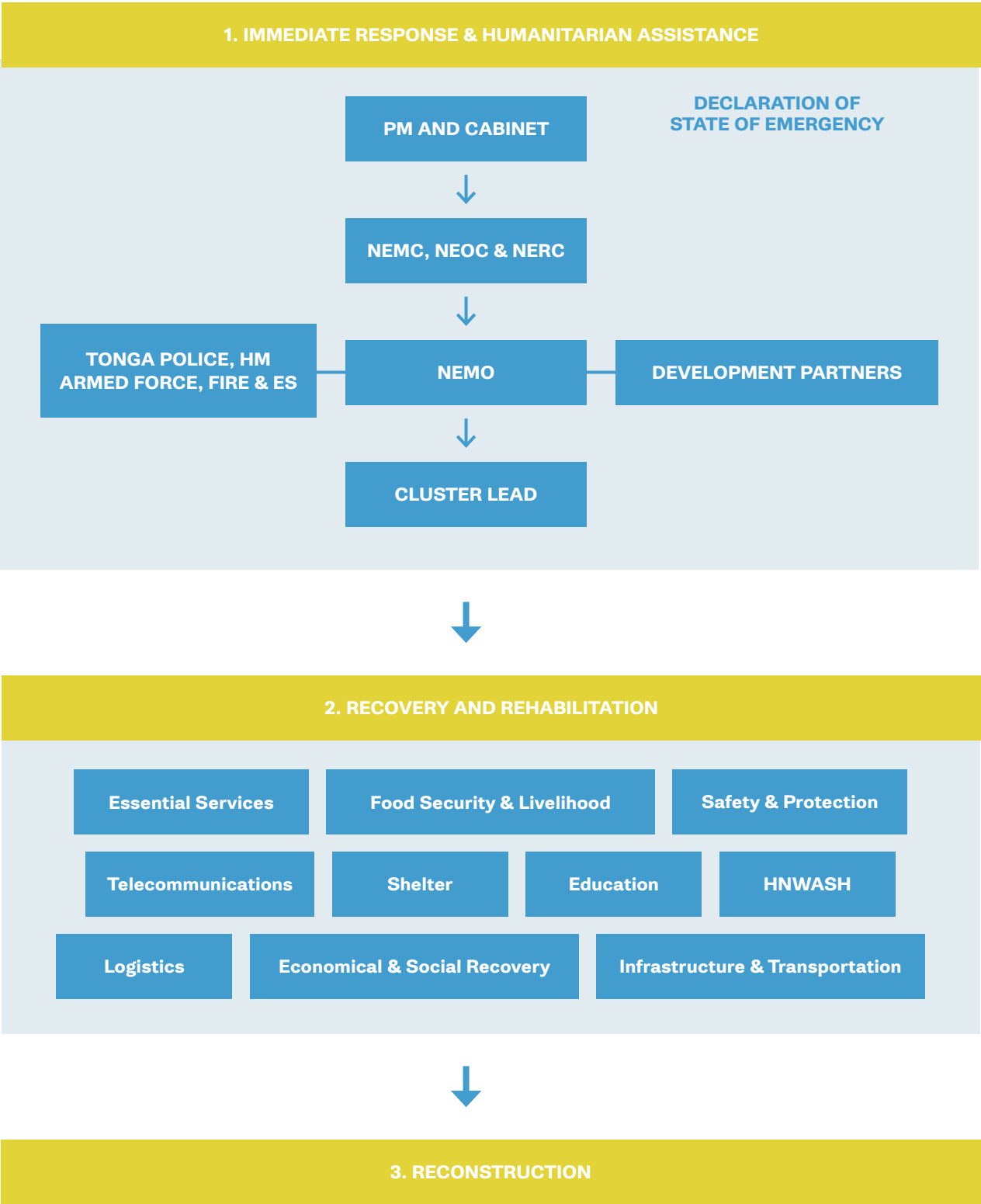
48. The curfew put in place was later extended to April 9, 2018.

### 5.2.2 PERFORMANCE OF EARLY WARNING SYSTEM

The director of meteorology at Tonga Meteorological Services recommended that the National Emergency Management Committee consider declaring a State of Emergency for Tonga, based on the meteorological information available to FTWC at 8 am on February 12, 2018, including the forecast track and prediction that TC Gita would reach Category 5 as it passed directly over Tongatapu. The purpose of this declaration was to prevent or minimize the loss of human life, illnesses, injury, property loss or damage, and damage to the environment. Consequently, a State of Emergency for all of Tonga was declared in Nuku'alofa at 10 am on February 12, 2018, by the acting prime minister, Hon. Semisi Sika.<sup>47</sup> The State of Emergency was declared for 28 days.<sup>48</sup> The National Emergency Management Committee, National Emergency Operation Committee, and National Emergency Recovery Committee—all of which are stipulated under the Emergency Management Act (2007)—were activated. Figure 20 sets out the structure that was put in place for responding to TC Gita. This was the first time the cluster framework was utilized in Tonga to aid in disaster response.

**FIGURE 20.**

**Structure of the TC Gita Humanitarian, Recovery, and Response Operation**



Note: PM = prime minister; NEMC = National Emergency Management Committee; NEOC = National Emergency Operation Committee; NERC = National Emergency Recovery Committee.

Following the Declaration of a State of Emergency, a number of precautionary measures were carried out:

- A curfew from 9 pm to 8 am was imposed by the police within the central business district of Nuku'alofa during the emergency period;
- Tonga Power preemptively shut down the electricity for Tongatapu at 7:55 pm on Monday, February 12, 2018; and
- Approximately 4,000 people self-evacuated to evacuation centers in advance of the most severe impacts of TC Gita.

Despite these precautions, damage was sustained to the early warning system during the storm. For this reason, the director of meteorology through the director of NEMO handed over tropical cyclone warning operations to RSMC Nadi at around 10:40 pm on February 12, 2018, in accordance with the Regional Southwest Pacific–Southeast Indian Ocean Tropical Cyclone Operation Plan. RSMC Nadi remained responsible for watching and issuing warnings for Tonga until the last cancellation advisory, which was issued at 3 pm on Tuesday, February 13, 2018. Although formal tropical cyclone warnings were handed over to RSMC Nadi, the FTWC remained operational and continued to provide manual support and radio updates to the public based on weather observations and barometer readings.<sup>49</sup>

### **5.2.3 DAMAGE TO THE NATIONAL MULTI-HAZARD EARLY WARNING SYSTEM**

The following damage was sustained to key early warning infrastructure as TC Gita struck Tongatapu on the evening of February 12, 2018:

- The FTWC office in Tongatapu sustained damage to the building and to communications and meteorological equipment (see section 4.3.2 on public buildings for more information). Mains power to the Met Office was cut prior to the cyclone as a precautionary measure, but was not restored until just before midday on February 22, 2018, due to damage to the power supply system. Consequently, the FTWC operated on standby generator for 10 days.

- Outside, in the FTWC enclosure, monitoring equipment was damaged. The Stevenson screens (which protect meteorological instruments from rain, high winds, etc.) were blown away, and all meteorological instruments previously protected by the screens were damaged. The elevation of the Himawari satellite dish was misaligned when the maximum gust hit, but the dish was operational again within two days, after a readjustment.
- AM Radio Tonga 1 (A3Z) failed, and consequently radio warnings were restricted to FM90 and FM87.5 radio stations.<sup>50</sup>

Despite the above damage, contingencies were in place to ensure a continuation of warnings during the event.

### **5.2.4 CONCLUSION**

Likely as a direct result of early warnings and preparedness measures in place in Tonga, no lives were lost due to TC Gita. The early warning and preparedness measures that were put in place in advance functioned well despite damage to physical infrastructure caused by the storm. Contingency arrangements, such as the transfer of warning operations to RSMC during the height of the storm, worked as planned. The Government of Tonga instituted the cluster system for the first time following TC Gita. Lessons on the functionality of the cluster system will inform planning for future disaster events.

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49. MEIDECC, "Tropical Cyclone Gita Meteorological Report," February 23, 2018.

50. Tropical Cyclone Gita Meteorological Report, MEIDECC, February 23, 2018.











# SUMMARY OF RECOVERY AND RECONSTRUCTION NEEDS

## The estimated cost of recovery and reconstruction is T\$ 326.8 million.

This assessment has identified Tonga's needs for recovery and reconstruction following TC Gita. The identification and quantification of disaster effects have been used to estimate disaster impacts at the sector, macro, and micro levels, and the results of the effects and impact analyses have provided inputs into the quantification of recovery and reconstruction needs. Recovery and reconstruction needs are prioritized as immediate (to be completed by June 30, 2018), short-term (to be completed between July 1, 2018, and June 30, 2019), and medium-term (to be completed between July 1, 2019, and June 30, 2021). These time frames are indicative, as timing will depend on a range of factors, including institutional arrangements and both domestic and external funding provisions.

The primary objective of the coordinated multi-sectoral identification of recovery and reconstruction needs presented in this report is to enable all people to improve their overall well-being by restoring their physical assets, livelihoods, and socio-cultural and economic status.

Recovery and reconstruction needs refer to both public and private sectors, which have both been affected by the impacts of TC Gita. However, this does not imply that the government should or will finance recovery and reconstruction for all stakeholders. Rather, the identification of these needs facilitates the process whereby the government is able to identify, quantify, and finance the needs that are within its purview, while still accounting for other recovery needs that will be financed by other means, including through the public sector or self-recovery.



## 6.1 MODALITIES FOR RECOVERY AND RECONSTRUCTION

There are a variety of possible recovery and reconstruction modalities, a combination of which could include the following:

- A program of recovery and reconstruction activities for key infrastructure, led by the government in collaboration with various stakeholders, including donor partners and NGOs;
- Direct assistance from the government to the poorer strata of the population, using cash grants and in-kind donations for recapitalization and reconstruction purposes; and
- Provision of softer-term credit (using lower interest rates and longer repayment periods) through the banking system to creditworthy private individuals and businesses for both working capital replenishment and reconstruction expenditures.

No one agency or group will be able to achieve recovery alone, and collaboration will be essential in bringing together those who have a role in recovery, including government as well as business, cultural, and other nongovernment sectors. This approach will support the complete recovery of economic and social activity by all disaster-affected sectors, enterprises, and people.

## 6.2 OVERVIEW OF RECOVERY AND RECONSTRUCTION NEEDS

This assessment indicates that the total damage and losses from TC Gita are T\$356.1 million. Total recovery and reconstruction costs are estimated at T\$326.8 million. Of this amount, T\$73.0 million will focus on immediate recovery, T\$95.4 million will be required for short-term recovery, and T\$158.3 million will be required for long-term recovery. Recovery and reconstruction will initially focus on the most affected sectors, while also ensuring that other affected sectors are supported.

Table 63 summarizes the quantification of immediate, short-, and medium-term recovery needs for all the sectors. Please refer to the individual sector chapters for further details.

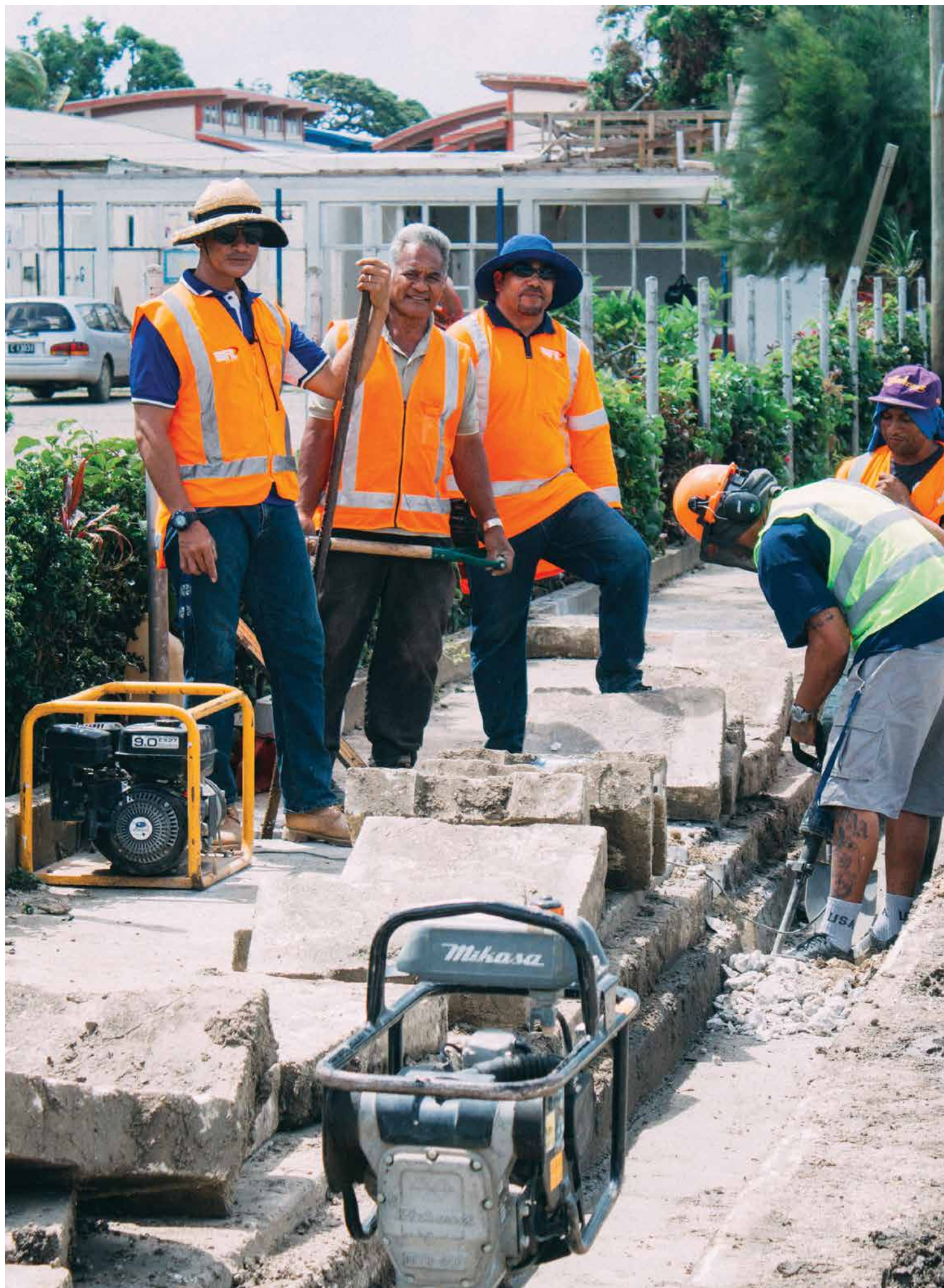
**TABLE 63. Recovery Needs by Sector (T\$ millions)**

|  | IMMEDIATE<br>RECOVERY<br>NEEDS | SHORT-TERM<br>RECOVERY<br>NEEDS | MEDIUM-TERM<br>RECOVERY<br>NEEDS | TOTAL<br>RECOVERY<br>NEEDS |
|--|--------------------------------|---------------------------------|----------------------------------|----------------------------|
| <b>Productive Sectors</b>                            | <b>37.79</b>                   | <b>12.63</b>                    | <b>6.61</b>                      | <b>57.03</b>               |
| Agriculture  | 0.99                           | 2.73                            | 5.11                             | 8.83                       |
| Commerce and Industry                                | 4.30                           | 7.00                            | 1.50                             | 12.80                      |
| Tourism  | 32.50                          | 2.90                            | NA                               | 35.40                      |
| <b>Social Sectors</b>                                | <b>14.40</b>                   | <b>77.60</b>                    | <b>48.50</b>                     | <b>140.50</b>              |
| Housing  | 5.80                           | 72.10                           | 40.50                            | 118.40                     |
| Education  | 8.50                           | 5.50                            | 8.00                             | 22.00                      |
| Health   | 0.10                           | NA                              | NA                               | 0.10                       |
| <b>Infrastructure Sectors</b>                        | <b>15.61</b>                   | <b>2.68</b>                     | <b>87.78</b>                     | <b>106.07</b>              |
| Energy   | 13.38                          | 0.00                            | 86.20                            | 99.58                      |
| Public Buildings                                     | 0.31                           | NA                              | 0.70                             | 1.01                       |
| Transport  | 0.68                           | 1.58                            | 0.88                             | 3.14                       |
| Water and Sanitation                                 | 1.24                           | 1.10                            | NA                               | 2.34                       |
| <b>Employment, Gender,<br/>and Social Protection</b> | <b>5.23</b>                    | <b>2.52</b>                     | <b>15.45</b>                     | <b>23.20</b>               |
| <b>TOTAL</b>   | <b>73.03</b>                   | <b>95.43</b>                    | <b>158.34</b>                    | <b>326.80</b>              |

Source: Estimations by Assessment Team based on government figures.

Note: NA = not applicable. A detailed breakdown of needs is included in each sector assessment.









# 7

## WAY FORWARD

The recovery needs that were identified during the Post-Disaster Rapid Assessment process are not linked to the availability or form of recovery funding, but are driven by the analyses of sectoral needs. Given the extent of identified needs and the limited resources, the first step should be to prioritize the sectors for recovery and reconstruction based on the available financial envelope and a number of strategic considerations. A criteria-based prioritization of recovery needs across competing sectors will be necessary and could include the following principles:

- Potential for direct and widest humanitarian impact;
- Potential to generate sustainable livelihoods;
- Inclusiveness (pro-poor and pro-vulnerable strategies);
- Balance between public and private sector recovery; and
- Restoration and rebuilding of critical infrastructure and services.

The recovery program, while implemented under the government's leadership, will be carried out in close collaboration and partnership with international donors, the private sector, civil society, and the community as a whole.

### **7.1 DEVELOPMENT OF A DISASTER RECOVERY FRAMEWORK**

The Post-Disaster Rapid Assessment and similar disaster assessments are an essential component of a successful DRF, which should (i) develop a central vision for recovery; (ii) define guiding principles; (iii) identify primary recovery sectors; (iv) assess government capacity to manage recovery; (v) appoint an appropriate recovery leader; (vi) establish appropriate institutional arrangements; (vii) clarify institutional roles and responsibilities; and (viii) establish coordination mechanisms, conduct funding gap analysis, and mobilize funds.

The DRF will outline needs for the first three years of recovery (2018–2021) as identified in this Post-Disaster Rapid Assessment, including immediate needs (for the first three months), short-term needs (for FY2018/19), and medium-term needs (for FY2020/21). The DRF will inform the development of sector-based recovery plans or programs that will guide the required recovery activities and confirm more accurate costings.

## **7.2 INSTITUTIONAL AND POLICY SETUP (INCLUDING GOODS AND SERVICES)**

Policy and institutional gaps related to the implementation of recovery and reconstruction can cause challenges for agencies involved in recovery in affected communities. The government will need to immediately identify and address these gaps in order to support an efficient and effective recovery. Currently, there is the need to

- Finalize the housing policy/strategy and other recovery-related policies that have yet to be finalized;
- Confirm coordination mechanisms on the ground among ministries, divisions, the private sector, development partners, communities, and civil society organizations;
- Ensure the availability and on-time release of funds to line ministries for implementing projects; and
- Increase implementation capacity within ministries to support reconstruction activities.











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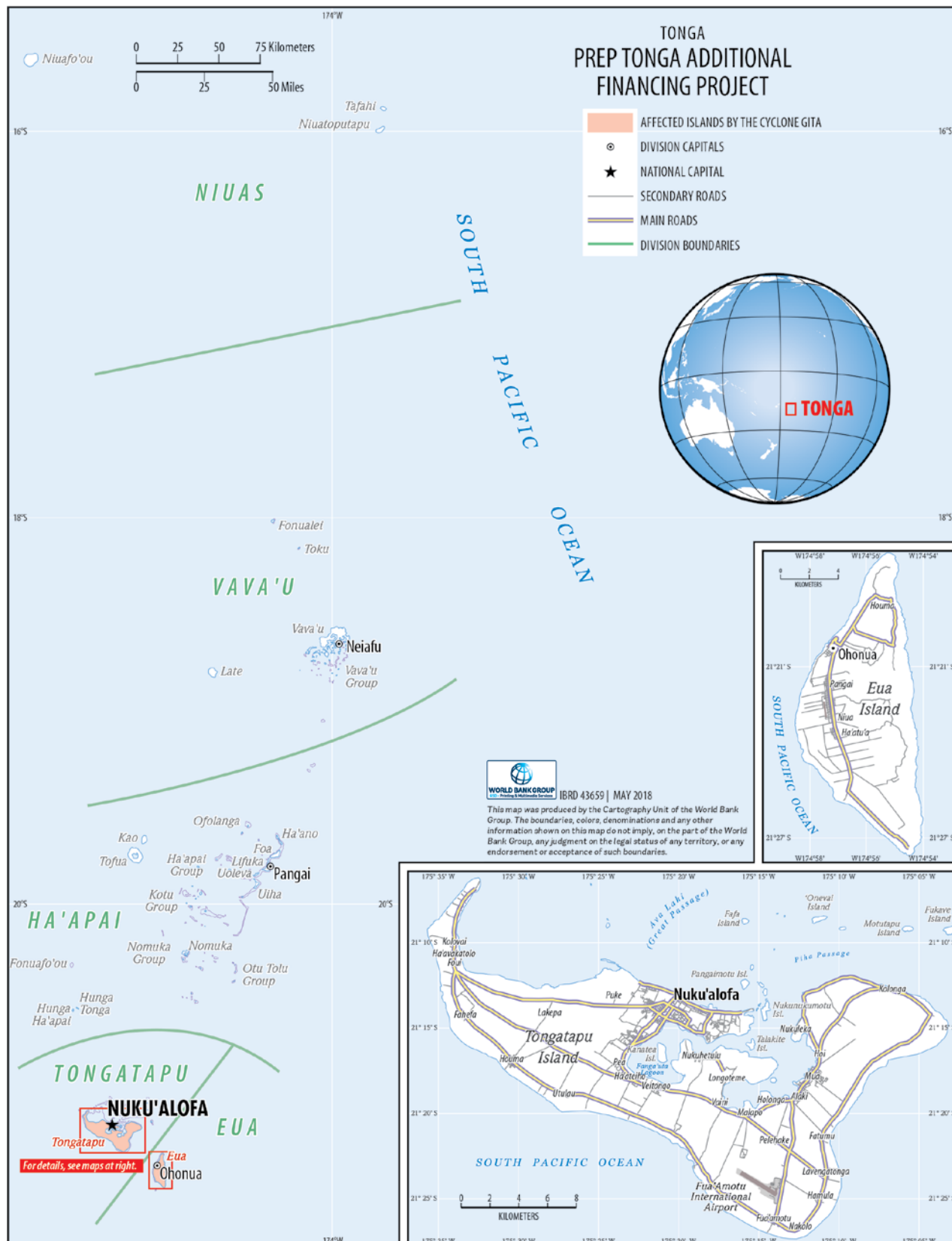
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# ANNEX 1: MAP OF TONGA





## ANNEX 2: COMMERCE SECTOR ESTIMATION

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The assessment of damage and losses is more complex in the commerce sector than in other sectors because of the large number of existing businesses in the affected areas of Tongatapu (over 3,000) and 'Eua (110), and because of the limited data on business types and size. The following assumptions were made in estimating the assessed damages and losses to the sector:

1. Damages to buildings, assets, and stocks were based on returned values for Q19, Q21, and Q22.
2. To account for the “unknown” returns from the survey, an adjusted 20 percent of the damage to buildings is included for manufacturing, processing, and cottage industry businesses, and 10 percent is included for commerce businesses. No further adjustments were made to the “unknowns” for asset and stock damages.
3. The business survey return without responses to Q15 and Q16 were supplemented with answers to Q13 on lowest point in the monthly income range and adjusted to the relevant business type with rounded averages: 20 percent for manufacturing, 50 percent for processing, and 20 percent for both cottage industry and commerce.
4. The loss values for the recovery period were adjusted for the anticipated return period to pre-disaster monthly revenue using “I don’t know” as equivalent to the longer period (i.e., four months) and “Unknown” as equivalent to the shorter period (two months).
5. The estimation of the total damage and losses was adjusted to the percentage of those affected by business type (Q1). In addition, the survey finding that 46 businesses from the initial 100 sampled were not trading before the cyclone led to an adjusted 30 percent to account for those assumed not trading before the cyclone, consistent with the discrepancy between the business registry and tax-paying businesses (86 in 'Eua and 2,594 in Tongatapu) before adjusting for tourism, transportation, construction, telecommunications, and recycling services (30 percent discrepancy).

The estimation of damage and loss was subject to the following limitations:

1. To estimate the cost for 3,589 businesses (3,492 in Tongatapu and 107 in 'Eua), 103 sampled businesses were used, including 8 manufacturing, 5 processing, 14 cottage industry, and 76 commerce businesses.
2. Businesses in 'Eua were not covered in the sample.
3. The monetary value of estimated losses was based on return estimates, and percentage averages by business type from selected return values.
4. The availability of data on specific business activities was as of March 2018.

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Photo: Malani Wolfgramm/World Bank. Damaged wharf, Nuku'alofa





On the evening of February 12, 2018, Tropical Cyclone Gita passed over the Tongatapu and 'Eua island groups of Tonga as a destructive Category 4 Cyclone, with average wind speeds of 130 km/h and gusts of up to 195 km/h. An accompanying storm surge reached 1 m above normal high-tide levels, and 200 mm of rainfall fell over a 24-hour period.

Tropical Cyclone Gita resulted in significant damage on both Tongatapu and 'Eua, impacting approximately 80,000 people, which is around 80 percent of Tonga's population. The storm brought down power lines; damaged and destroyed schools, resulting in closures; destroyed crops and fruit trees; and damaged public buildings, including the domestic airport, the Parliament building, and Tonga meteorological services.

Over 800 houses were destroyed and a further 4,000 were damaged. The Government of Tonga conducted a Post-Disaster Rapid Assessment in order to assess the impact of Tropical Cyclone Gita on key sectors, gain a full understanding of the scale of the economic impact, and assist in mobilizing the resources needed for recovery and reconstruction.



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