

Progressing GCCA+ SUPA activities in Tonga after the tsunami of 15th January 2022

Project brief 22.02.22

1. Background

The GCCA+ SUPA project had progressed plans and issued one contract for hard and soft coastal protection measures along northern Tongatapu, with work to start in January 2022. The tsunami that happened on 15.01.22 caused extensive damage and the project now requires a re-design of the on-the-ground activities.

2. GCCA+ SUPA Project Planned Coastal Measures

- As of 31.12.21 one contract had been issued to the Government of Tonga for the establishment of a mangrove nursery and replanting programme and a Request for Proposals was scheduled for advertisement in January 2022 for the supply and installation of hard coastal protection measures as given below:
 - Kanokupolu to Ha'atafu coastline (heightening of 600m of revetment at northern end);
 - Kolovai to 'Ahou coastline (extension of seawall from Kolovai to 'Ahou)
- On 15.01.22 the Hunga Tonga–Hunga Ha'apai Volcano in Tonga erupted. The eruption triggered a devastating tsunami that swept over the Tongatapu, 'Eua and Ha'apai group of islands.
- The tsunami generated 15m high waves in some parts of Tonga and led to three fatalities.



This photo shows the extent of the damage at Kanokupolu where the revetment was to be heightened.

The Government of Tonga stated that the volcanic eruption and tsunami affected 84,000 people (more than 80% of the population) in the Tongatapu, 'Eua and Ha'apai divisions of the Kingdom. The extent of the damages is described in section 4 and photos in section 5.

- Tonga is still in a state of emergency and normal communication via telephone and internet has not been restored.

3. Way forward

The planned coastal protection engineering measures under the GCCA+ SUPA project covered repairs and raising of an existing seawall and revetment. Judging from the photographs we anticipate the seawall and revetment have been destroyed. Coastal protection for the entire Tongatapu coastline will require reassessment.

4. Extent of damages

- According to the United Nations Satellite Center (UNOSAT), Kolovai District in Tongatapu (which includes 'Ahou Village, Kolovai Village and Kanokupolu Village) had the highest number of affected buildings with 194 damaged buildings detected in the building damage assessment. Find below an overview by UNOSAT of the building/structure damage assessment in the Tongatapu division.

Division/District	Area of Division/District (km ²)	Analysis Extent		Building damage assessment			Road/ bridge obstacles assessment		
		Analysed Extent (km ²)	Analysis extent coverage percentage	Damaged Buildings	Potentially Damaged Buildings	Total of Damaged and Potentially Damaged Buildings	Road/bridge Obstacles	Potentially Road/bridge Obstacles	Total of Road Obstacles and Potentially Road Obstacles
Tongatapu	262.88	261.03	99%	301	1,774	2,075	201	225	426
Kolofo'ou	12.53	12.03	96%	72	627	699	70	99	169
Kolomotu'a	23.10	23.10	100%	11	523	534	46	21	67
Kolovai	20.80	20.80	100%	194	85	279	53	29	82
Lapaha	52.23	50.88	97%	14	439	453	29	47	76
Nukunuku	35.02	35.02	100%	3	20	23	-	3	3
Tatakamotonga	54.20	54.20	100%	3	66	69	2	10	12
Vaini	65.00	65.00	100%	4	14	18	1	16	17

- The latest reports suggest that the villages of Kanokupolu, 'Ahou and Fo'ui in northern Tongatapu have been heavily damaged, with residents forced out of their homes.
- The World Bank's Global Rapid Post-Disaster Damage Estimate (GRADE) report highlighted that Tongatapu recorded the highest estimated damage, with approximately US\$69 million in damages. However, distribution of damages appears to have varied greatly across islands, with some islands like Atata and Mango experiencing almost complete destruction, while the Vava'u group fortunately experienced only minimal damage from ashfall.
- According to the GRADE report:
 - Around 600 structures in total, including at least 300 residential buildings, have been damaged or destroyed by the tsunami waves in Tonga with an estimated US\$43.7M of damage. Many tourism businesses have been particularly hard hit – with accommodation, wharves and worker's homes destroyed or severely damaged.
 - Tonga's agricultural sector has been significantly impacted – with 85% of agricultural households nationwide affected to some extent, and an estimated US\$20.9M of damage to this sector; including crops lost, and damage to shallow reef fisheries.
 - The tsunami and volcanic ashfall caused an estimated US\$20.9M in damage to infrastructure - including roads, causeways, power supply, ports/marine and water supply infrastructure as well as the submarine cable.
 - Ash clean-up costs will be significant and are estimated to cost just under US\$5M for buildings and paved road infrastructure.
- Nuku'alofa's waterfront is seriously damaged with rocks and debris pushed inland by the tsunami. A large part of Nuku'alofa's small fishing fleet was destroyed.
- The areas of Popua, Patangata, Kanokupolu, and 'Ahou have been sprayed for vector control and decontamination and the ground water has been chlorinated for safety. There are still serious concerns about access to safe food and water, the quality of groundwater and the risk of infectious diseases.
- The volcanic eruption near Tonga shredded an 80-kilometer (50 mile) stretch of undersea cable. It will take weeks to repair the cable and restore full communication between Tonga and the rest of the world.
- Across Tongatapu 90% of power has been restored as work continues for full restoration.
- It is estimated that more than 32,000 children have been psychologically affected by the emergency.
- Tonga is under a dual state of emergency – the volcanic eruption with ensuing tsunami and the rapid rise in COVID-19 cases. On 03.02.22, Tonga reported 6 positive cases of COVID-19. By 18.02.22 Tonga had reported a total of 234 cases with 38 recoveries and 196 active cases.

5. Photos

Kanokupolu to Ha'atafu coastline – 14 Jan 2022



Kanokupolu to Ha'atafu coastline – 16 Jan 2022



Tsunami waves reaching Nuku'alofa, the capital of Tonga



Waves hitting homes along the waterfront in Nuku'alofa



Part of the waterfront in Nuku'alofa



Ash-covered landscape in Tongatapu



A boat rests on the wharf at the Nuku'alofa boat harbour



Search and rescue operation in Ha'atafu Village on 16.01.22



Main port facilities in Tongatapu before the eruption



Main port facilities in Tongatapu after the eruption



Sources:

[3 deaths, significant damage confirmed following Tonga eruption](#)

[15 January 2022 Volcanic Eruption and Tsunami. Preliminary Satellite-Based Comprehensive Damage Assessment Report](#)

[24 new COVID-19 cases, lockdown restrictions relaxed](#)

[80 per cent of Tonga population impacted by eruption and tsunami](#)

[Extensive damage in tsunami-struck Tonga](#)

[First official update following the volcanic eruption from the Government of Tonga](#)

[Images and patchy communications reveal devastation in Tonga after tsunami unleashed by massive volcano eruption](#)

[International Aid Starts to Arrive in Tsunami-hit Tonga](#)

[Mapping a First Look at Tonga's Devastation After the Volcano Eruption](#)

[New Zealand Defence Force images reveal scale of damage from Tonga volcano as thousands evacuated](#)

[NZDF surveillance photos assess scale of damage from Tonga eruption and tsunami](#)

[Tonga eruption: Even the dogs were covered in ash](#)

[Tonga National Emergency Management Office \(NEMO\) Situation report #9 – 22 January 2022](#)

[Tonga: Volcanic Eruption and Tsunami - Jan 2022](#)

[Tonga Volcanic Eruption and Tsunami: World Bank Disaster Assessment Report Estimates Damages at US\\$90M](#)

[Tonga: Volcanic Eruption Situation Report No. 2 \(As of 28 January 2022\)](#)

[Tonga: Volcanic Eruption Situation Report No. 4 \(As of 10 February 2022\)](#)

[Tonga volcano: New images reveal scale of damage after tsunami](#)

[Tonga volcano, no tsunami threat to Fiji](#)

[Tongans in New Zealand Desperate to Send Supplies Back Home](#)

[Tsunami threat remains for parts of Australia despite warning downgrade, after underwater volcanic eruption near Tonga](#)

[Volcano Damage to Tonga Undersea Cable Worse Than Expected](#)

[We're back, but without full internet](#)

['We want one disaster, not two': Tonga struggles to keep COVID at bay](#)