

**** January 2025 News from Sentinel Asia Project Office ****

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2. [Interview] Ms. 'Ofa Masiwawa, Geospatial Officer, National Disaster Risk Management Office (NDRMO) of Tonga
3. How to send an Emergency Observation Request
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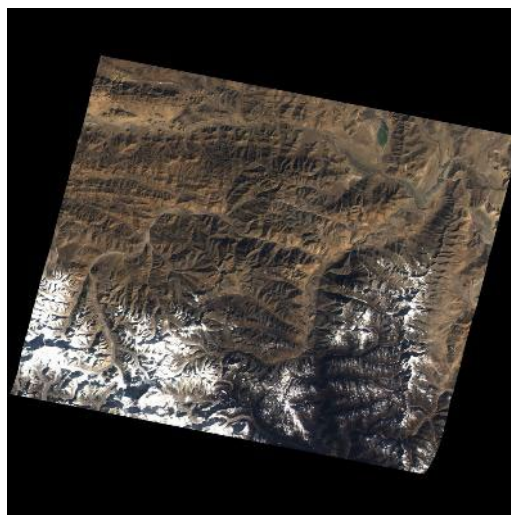
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1. [News] Emergency Observation of Disasters (as of 28 January)

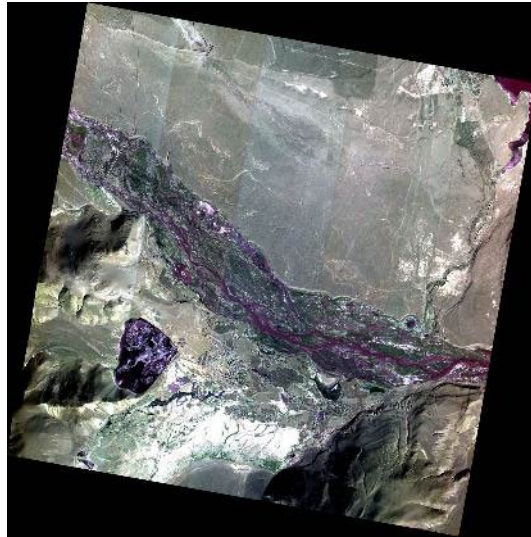
(1) Earthquake in Xizang, Southwest China on 7 January, 2025 (GLIDE Number [EQ-2025-000004-CHN](#))

On 7 January, a 6.8-magnitude earthquake jolted southwest China’s Xizang Autonomous Region. Xinhua reported that a total of 126 people have been confirmed dead and 188 others injured. <https://english.news.cn/20250108/a1beee2e00154f05aa7931de60545884/c.html>

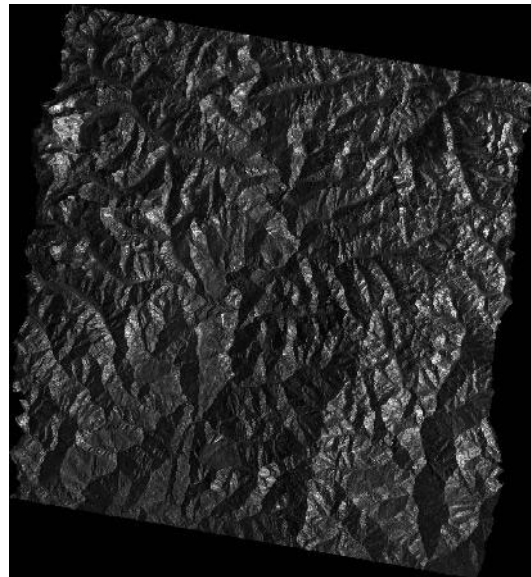
Institute of Geology, China Earthquake Administration (CEA) made an Emergency Observation Request (EOR) to Sentinel Asia on 7 January. Among Data Provider Nodes (DPNs), GISTDA, ISRO, JAXA, and TASA provided data. Among Data Analysis Nodes (DANs), AIT and EOS provided their Value-Added Products (VAPs). Information on the latest response by Sentinel Asia is available at the link below. <https://sentinel-asia.org/EO/2025/article20250107CN.html>



Post-disaster satellite image (THEOS-1) provided by GISTDA



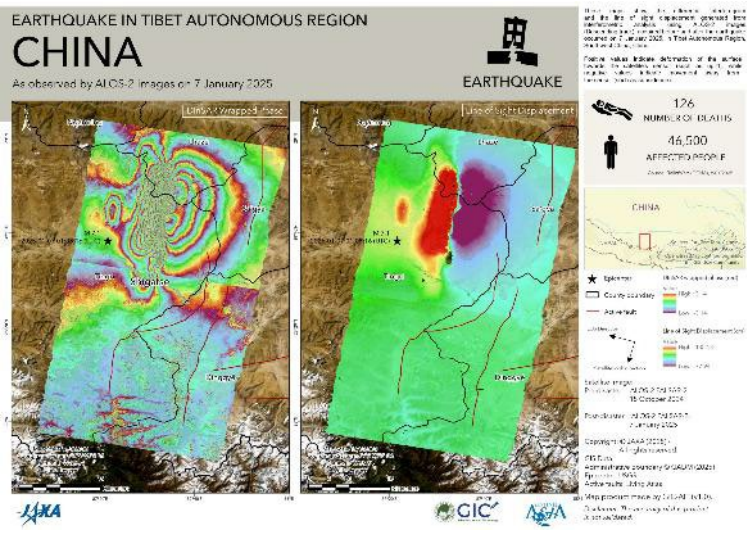
Post-disaster satellite image (CARTOSAT-2E) provided by ISRO



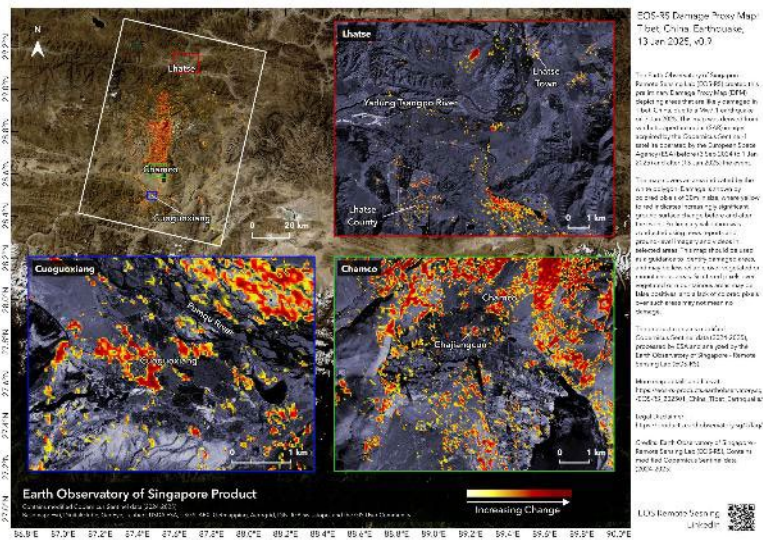
Post-disaster satellite image (ALOS-2) provided by JAXA



Post-disaster satellite image (FORMOSAT-5) provided by TASA



Value-Added Product by AIT



Value-Added Product by EOS

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2. [Interview] Ms. 'Ofa Masiwawa, Geospatial Officer, National Disaster Risk Management Office (NDRMO) of Tonga

Tonga, an island country in south Pacific, is facing the challenges caused by climate crisis, in addition to the natural disasters such as storms, volcanic eruptions, and earthquakes. The country established the National Disaster Risk Management Office (NDRMO) under the Emergency Management Act 2007, initially aimed at facilitating and coordinating emergency management for Tonga’s safety. The National Disaster Risk Management Act 2021 expanded its mandate, focusing on enhancing disaster risk reduction efforts.

NDRMO joined Sentinel Asia in 2024 to benefit from its cooperation scheme of using satellite data for disaster management for their challenges. The Sentinel Asia Secretariat interviewed Ms. ‘Ofa Masiwawa, Geospatial Officer at NDRMO, to share their knowledge and experiences with other Sentinel Asia members.



Sentinel Asia Secretariat:

NDRMO participated in Sentinel Asia this year after becoming an Authorized User of the International Disasters Charter. Could you introduce your organization to our readers?

Ms. ‘Ofa Masiwawa:

Thank you so much for this opportunity, and warm greetings from the Southern Hemisphere and the heart of the Pacific region.

National Disaster Risk Management Office, or NDRMO, operates under the Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change, and Communications (MEIDECC), which is the largest ministry in Tonga, encompassing all the technical and scientific work for the government. Recently, we added another “C” for CERT, Computer Emergency Response Team, which oversees all cybersecurity operations at the national level.

Our office was first established in 1998 under the Ministry of Works as a small section. Over the course of nine years, we provided significant support and assistance to the people of Tonga. Recognizing the growing importance of our work, in 2007, we were restructured into a formal department known as the National Emergency Management Office (NEMO). Interestingly,

children often associate us with “Nemo the fish” during our awareness campaigns, but we emphasize that NEMO represents a working department focused on humanitarian response.

Under NEMO, our operations were mandated by the Emergency Management Act of 2007. This legislation empowered us to lead all emergency response efforts in Tonga. However, as climate-related and geological hazards became more frequent and severe, and the demand for humanitarian responses grew—along with social protection issues—the need for a broader mandate became clear.

Recognizing these evolving challenges, the office advocated for a comprehensive review of its responsibilities. This led to the development of the Disaster Management Act of 2021, which expanded and redefined our role. As part of this transition, we rebranded as the National Disaster Risk Management Office (NDRMO) to reflect our expanded focus on building resilience through enhanced preparedness and proactive disaster risk reduction efforts.

The updated Disaster Management Act of 2021 empowers NDRMO to:

- Cover all islands within Tonga’s waters.
- Address cross-sectoral needs.
- Coordinate humanitarian responses.

Today, NDRMO leads Tonga’s disaster risk reduction initiatives and serves as the primary coordination body for humanitarian needs at the national level. Our work covers all phases of disaster management, from preparedness and mitigation to response and recovery. In summary, NDRMO is dedicated to enhancing Tonga’s resilience to disasters by leading proactive, inclusive, and effective disaster management efforts.

Sentinel Asia Secretariat:

We also appreciate your first attendance at Sentinel Asia’s Joint Project Team Meeting (JPTM) this year held in Quezon City, the Philippines. What were your impressions of the event? Did you find anything useful or new, such as methods or communications with participants?

Ms. ‘Ofa Masiwawa:

To be honest, I was deeply impressed. As I mentioned in my presentation in the Philippines, my journey with remote sensing began in a humble laboratory in Fiji. From those early undergraduate years to now standing among some of the world’s and the region’s most renowned satellite data providers, it truly feels like a blessing. The networking opportunities at the Pacific Geospatial and Remote Sensing Conference in 2023 were invaluable. Through this platform, Tonga was able to

establish crucial connections with technical advisory teams such as UN-SPIDER, which ultimately facilitated Tonga's membership in the prestigious Sentinel Asia community.

The conference presentations were incredibly enlightening, showcasing how various space and disaster management agencies leverage their products to support disaster management. The training sessions, in particular, were outstanding, providing actionable insights into best practices and workflows, including damage assessment using satellite imagery.

This kind of expertise is precisely what Tonga urgently needs. With our country's limited resources, particularly manpower, these insights can significantly improve disaster response times and operations. By quickly identifying which communities to prioritize, we can enhance the efficiency and effectiveness of our disaster management efforts.

Sentinel Asia Secretariat:

What is your motivation to participate in Sentinel Asia, and what benefits do you see in it for Tonga?

Ms. 'Ofa Masiwawa:

I would like to highlight one point in particular: my primary motivation has always been the people of Tonga. I wouldn't be this passionate about advocating for Tonga to have a seat at the table if it weren't for them. The Pacific Island nations are living examples of the harsh realities of climate change. Our geography, the small size of our islands, and the severe impacts of sea-level rise make us especially vulnerable.

In my six years at the Disaster Management Office, everything we do is driven by the people we serve, despite the limited resources at our disposal. Their resilience and needs inspire us to go above and beyond. Joining Sentinel Asia initiative gives us hope—hope that we can enhance our services, particularly in emergency response. With access to advanced satellite imagery, we can quickly identify affected homes and deploy response teams faster, especially to our outer islands scattered across vast distances.

For some, satellite imagery might just be pictures. For us, it's a life-saving tool. Like a sensor viewing the Earth, our team sees communities as people—people we aim to protect and guide toward a better understanding of risks and hazards. This is just the beginning of refining our work. We are committed to ensuring that every effort we make is centered on the well-being of our local people.

This pressing need for geospatial expertise has driven me to learn and acquire the skills necessary to enhance our disaster management practices and systems. While we've had numerous consultants over the years, it's often challenging to tailor their solutions to our country's unique context. Recognizing this, our office took the initiative to support my studies in geospatial sciences. The goal was for me to return with the ability to retranslate those skills and knowledge into practical applications that both our people and my colleagues could understand. This effort aims to emphasize the importance and value of geospatial solutions, particularly remote sensing, in disaster management. Over the years, we've worked with various consultants from different organizations, including the RedR Australia—a key humanitarian group within the region. These consultants have brought valuable skill sets in geospatial solutions and disaster management, guiding us in aligning global best practices with local needs. However, we recognize the importance of taking the initiative as locals to implement and adapt these policies to fit our unique context. This is why we've prioritized building our own capacity and fostering homegrown expertise.

Within disaster management, cross-sector engagement is central to our approach. Our goal is to ensure that disaster risk reduction activities are integrated across sectors. For example, the agriculture sector is increasingly aware of how remote sensing can be used to monitor vegetation health, which supports climate adaptation practices for farmers. By raising awareness of geospatial solutions among different sectors, we are fostering a deeper understanding of their potential to address specific challenges. As sectors identify their needs, we align these with requests to Sentinel Asia for further support. By leveraging their expertise and resources, we aim to bring best practices to our local efforts, ensuring that the tools and solutions we adopt have a meaningful impact across sectors. This collaborative approach strengthens our ability to serve the people of Tonga and addresses vulnerabilities in a way that is tailored to our national context.

This year, we took another step forward by creating an informal remote sensing group within the government. It's a small team of just five members, including representatives from the infrastructure, agriculture, health, transport, and climate change sectors. Together, we've started discussions to establish a user group space where we can share challenges and explore how geospatial solutions can address them. The goal is to bridge the gaps we face due to limited resources while tailoring these solutions to meet the needs of our country. Our efforts are motivated by the sobering fact that, in 2018, Tonga was ranked the second most vulnerable country in the world to disaster risks due to our geographic location and the hazards we face. This reality has fueled our commitment to pushing geospatial initiatives at the national level. By advocating for tools like remote sensing, we aim to strengthen disaster risk reduction and better serve our people.

Sentinel Asia Secretariat:

How is your participation in Sentinel Asia recognized within NDRMO and other agencies in your government?

Ms. ‘Ofa Masiwawa:

This ties back to our earlier discussion. Tonga’s participation in Sentinel Asia bridges critical gaps in our geospatial capabilities, particularly in refining the use of satellite imagery to identify damaged households and prioritize decision-making for those most directly impacted. This need has been a recurring theme in discussions with key government partners, facilitated through the cluster system we’ve adopted from the United Nations. The cluster system, a coordination tool designed to respond to large-scale humanitarian emergencies, was implemented globally by the UN in 2005 to enhance the quality and efficiency of humanitarian aid. Tonga adopted this system in 2018, and it is now mandated under the Disaster Risk Management Act of 2021. This system enables sector-specific needs to be incorporated into a broader, coordinated framework, with NDRMO serving as the lead coordination body. Each cluster focuses on specific humanitarian needs—for example, the WASH (Water, Sanitation, and Hygiene) cluster is led by the Ministry of Health. These clusters report back to the NDRMO, ensuring a centralized approach to disaster management. This structure has allowed Tonga to expand its presence on the global stage and leverage tools and products, like those offered through Sentinel Asia, to simplify processes and verify outputs.

Securing a seat with Sentinel Asia not only strengthens the operations of our small office but also benefits cross-sector efforts in disaster management. It provides vital support for planning, establishing community baselines, and deploying humanitarian aid more effectively across Tonga. This aligns with NDRMO’s key mandates under the DRM Act, which I always emphasize to my team:

1. Leading disaster risk management baselines and databases.
2. Conducting damage assessments and field community assessments.
3. Raising awareness within communities about disaster risks.

These core responsibilities are directly supported by geospatial solutions. However, raising awareness among sectors about the value of geospatial tools has been a challenge. Since establishing the GIS section two years ago, we’ve worked to demonstrate how these tools can address sectoral needs, despite initial resistance from some sectors regarding data sharing. Sensitive information, such as personal details, has been a barrier, but we’ve reassured sectors that non-sensitive data can still be shared to assist with ground truthing and community

assessments.

Over the past two years, we've built baseline data and strengthened our networking across sectors, bringing geospatial solutions into the disaster management space. While the journey has been challenging, particularly as a first-of-its-kind initiative, the progress we've made underscores the importance of collaboration and innovation in addressing Tonga's unique vulnerabilities.

Sentinel Asia Secretariat:

Tonga is prone to ocean storms and recently experienced a major volcanic eruption in 2022. Could you share some of your activities aimed at building capacity and addressing emerging threats?

Ms. 'Ofa Masiwawa:

Tonga's geographical location makes it highly vulnerable to both climate and geological hazards. As I've mentioned before, we face intensifying ocean storms and unprecedented events like the volcanic eruption on January 15, 2022. As a small nation with dispersed islands, we are constantly exposed to sea-level rise, tropical cyclones, storm surges, and flash floods—all of which threaten our communities.

Our mission is to build the capacity of the Tongan community through effective disaster risk management policies, plans, and programs to address these ongoing and future threats. To achieve this, we focus on several key activities:

1. Hazard Identification and Mapping

Our GIS team of three, as I mentioned during my presentation at the JPTM 2024, has been working over the past two years to develop baseline data for communities. While we rely on national census data collected every four years, we also focus on creating localized data specific to disaster risk reduction.

Each community in Tonga, as mandated by our Disaster Risk Management Act, must have an emergency committee and disaster risk reduction plans. Our team works to integrate these plans into a comprehensive baseline that includes details about vulnerable groups, infrastructure conditions, and hazards within each community.

Using this data, we develop detailed hazard maps that identify risks such as flood-prone areas. For example, after the 2022 volcanic eruption, satellite imagery from Sentinel Asia and other agencies allowed us to map the ashfall coverage. This helped prioritize emergency responses, such as distributing protective gear and educating communities on measures to safeguard against ashfall—an unfamiliar hazard for Tonga.

2. Community Engagement and Lessons Learned

We actively engage with communities to understand their experiences and challenges, incorporating their insights into our disaster management strategies. This ensures that our policies are practical and community focused.

For instance, feedback from outer island communities has improved our evacuation procedures and identified critical infrastructure needs. These insights are also shared with the climate change department to inform long-term adaptation strategies. This iterative approach ensures that policies remain relevant and responsive to the needs of our people.

3. Adoption of Advanced Technology

Our partnership with Sentinel Asia has been transformative, enabling us to access high-resolution satellite imagery for rapid damage assessments. This technology allows us to identify impacted households quickly and deploy response teams more efficiently, particularly to remote islands. This capability is critical for enhancing our responses to cyclone damage and preparing for large-scale future events. By leveraging these advanced tools, we can ensure that our limited resources are used where they are needed most.

4. Preparedness and Awareness Programs

Through hazard mapping and community-focused training, we aim to strengthen disaster preparedness at the grassroots level. These initiatives reduce vulnerabilities and empower communities to adapt to the risks they face while remaining in their homes.

For many, relocation isn't an option, so our focus is on providing practical support and education to help them manage risks effectively.

5. Integration into a Comprehensive Framework

Our ultimate goal is to integrate these efforts into Tonga's comprehensive disaster risk management framework. This approach not only addresses current hazards but also prepares for emerging threats, ensuring resilience at both the community and national levels.

By combining local knowledge, advanced technology, and international collaboration, we aim to create a resilient Tonga. This includes developing best practices for utilizing satellite imagery to strengthen disaster risk management and enhance the well-being of our people.

Adaptation measures, such as provisions for water tanks and heat-related interventions, play a critical role in preparing our communities for the long term. These measures not only address immediate needs but also enhance overall preparedness levels. As highlighted in the recent COP discussions, the global effort to maintain the 1.5°C temperature threshold is essential—not just

globally, but especially for vulnerable nations like Tonga.

For us, this target underscores the importance of collaboration between our disaster management office and the climate change department. While our focus lies in response, mitigation, and preparedness, the climate change team contributes by strengthening these key components of disaster management. Together, we aim to not only reduce risk but also foster resilience. Our goal is to shift communities away from heavy reliance on aid and towards building own capacity to withstand natural hazards.

Tonga's unique vulnerability stems from the multi-hazard risks we face. We rarely experience just one type of disaster; instead, we often face multiple hazards simultaneously. For example, in 2022, we endured a volcanic eruption, followed by a tsunami, all while grappling with the challenges of COVID-19. This reality has driven us to adopt a more comprehensive approach, assessing and preparing for multi-hazard risks. Our focus is on worst-case scenarios, incorporating climate, geological, and health-related threats into our planning. This holistic approach ensures that we are better equipped to face any emergency threats that may arise, safeguarding the resilience and well-being of our communities.

These activities represent our commitment to achieving the goals outlined in our national disaster risk management strategy. By building on these efforts, we can ensure a safer, more prepared Tonga for generations to come.

Sentinel Asia Secretariat:

To achieve your goals, what do you expect from satellite remote sensing?

Ms. 'Ofa Masiwawa:

As we move into 2025, we aim to further strengthen our capabilities by seeking opportunities with JAXA and other space and disaster management agencies operating in this field. Our goal is to arrange site visits or specialized training for our technical staff. This initiative would provide islanders like us with valuable exposure to the processes and management of emergency satellite requests, as well as the practical applications of satellite imagery.

By gaining a deeper understanding of these operations, we can refine our workflows to align with global best practices while ensuring that they are tailored to Tonga's unique needs. Additionally, this engagement would help us strengthen partnerships with leading space agencies, fostering collaboration and creating opportunities to share our experiences and insights. By contributing to the development of systems and workflows from a Pacific Island perspective, we aim to build a more inclusive and effective framework for emergency response and disaster management across

the region.

One of our ultimate goals is to expand awareness among disaster management offices across the Pacific region about Sentinel Asia and its potential contributions. While the decision to join lies with individual countries, raising awareness about its benefits is key. For Tonga, our participation is driven by our unique needs, and the value we see in leveraging these resources for national disaster management.

A major concern for us is addressing the limitations posed by our limited resources. While we've had many experts and volunteers come to Tonga to provide training, these efforts are often constrained by our inability to fully build and sustain the capacity required. Therefore, it's equally important for our team to have opportunities to go out into the field, observe operations firsthand, and bring back knowledge to enhance our systems.

By engaging directly with space agencies and showcasing the importance of our work, we can also better advocate for our donors and funding partners. This would help secure funding to mainstream tools and resources that can be implemented within our workspace. Such support would enable us to better serve our country, while also providing quality data back to Sentinel Asia, such as ground truthing, which further supports the initiative on a regional scale.

Collaboration with organizations like JICA, Japan International Cooperation Agency, is a promising path forward. In 2025, we hope to explore opportunities for GIS and remote sensing support, potentially focusing on capacity-building programs specific to these areas. This would help bridge gaps, expand our technical knowledge, and ensure that we continue contributing meaningfully to both national and regional disaster management efforts.

Sentinel Asia Secretariat:

As a Sentinel Asia member in the South Pacific, what are your thoughts on cooperating with other institutions in the region, including SPC?

Ms. 'Ofa Masiwawa:

Thank you so much for the question. I anticipated this topic would come up at some point, and I'm glad to address it. First, we would like to express our sincere appreciation to the Secretariat of the Pacific Community (SPC) for their ongoing support as a key regional partner. Their efforts in assisting disaster management officers across Pacific Island nations have been invaluable. However, as Tonga continues to enhance its in-country capabilities, we are now poised to strengthen our position on the global stage.

Our focus is on advocating for improved early warning systems and practices while fostering connections within the global geospatial community. This effort not only contributes to Tonga's resilience but also empowers our local disaster management officers, particularly in the fields of geospatial analysis and remote sensing. Through targeted capacity-building initiatives, we aim to ensure that our team is well-equipped to address emerging challenges.

While we deeply value the role of regional bodies like SPC, we believe that having enhanced in-country capabilities enables us to extend our reach and establish direct communication with global communities. This approach allows Tonga to articulate its specific needs and share its unique perspective on disaster management challenges and opportunities.

In essence, we are committed to balancing our collaboration with regional partners while expanding our voice and presence on the global stage. By doing so, we hope to foster stronger partnerships, exchange knowledge, and advocate for solutions that reflect Tonga's resilience.

Sentinel Asia Secretariat:

Do you think Tonga can contribute to Sentinel Asia, and how?

Ms. 'Ofa Masiwawa:

At this stage, the most we can contribute to Sentinel Asia's efforts is providing ground truthing information. This is a valuable step that supports the initiative, but it would not be feasible without a deep understanding of the workflows at both the data provider and analysis stages. It is crucial for us to comprehend these workflows—from the satellite perspective to on-ground operations—to ensure alignment between the data and the information being generated. This understanding will also allow us to identify areas where practices can be refined for improved outcomes. Tonga is committed not only to sharing situation reports but also to offering ground truthing data to enhance the accuracy of imagery analysis and damage assessments conducted by Sentinel Asia. By contributing in this way, we can support and improve the efforts of data providers and analysts within the network.

For now, we will continue sharing our experiences and best practices that have proven effective for Tonga. At the same time, we are keen to learn from other communities within Sentinel Asia. Observing how these systems work for others can help us assess their practicality and potential for implementation in Tonga. This collaborative exchange of knowledge and practices is essential for fostering mutual growth and building resilience across the region.

This interview article is also available on Sentinel Asia website: <https://sentinel-asia.org/interview/interview.html>

