HELP.NGO FOUNDATION
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BRAZIL FLOODING RESPONSE 2024

7 EXPERTS deployed

900 HECTARES mapped

363 GB DATA collected

1050 CITY BLOCKS assessed

CONTENTS

EXECUTIVE SUMMARY

In May 2024, in response to severe flooding in Rio Grande do Sul, Brazil, Help.NGO launched an emergency response operation, swiftly supported by AWS (Amazon Web Services), to provide critical assistance and relief to local responders and affected communities.

Drawing upon our previous engagement and experience in Brazil, such as Help.NGO's response to landslides in Petrópolis in 2022, along with our established contacts in AWS and local authorities, and bolstered by cutting-edge technology such as cloud computing, drones, and mobile connectivity, Help.NGO promptly began its response.

Following intense rainfall and the rupture of a hydroelectric dam on May 2, the region experienced unprecedented casualties, displacement, and infrastructural damage. The situation, compounded by continued heavy rainfall, necessitated an urgent and coordinated response.

SITUATION OVERVIEW

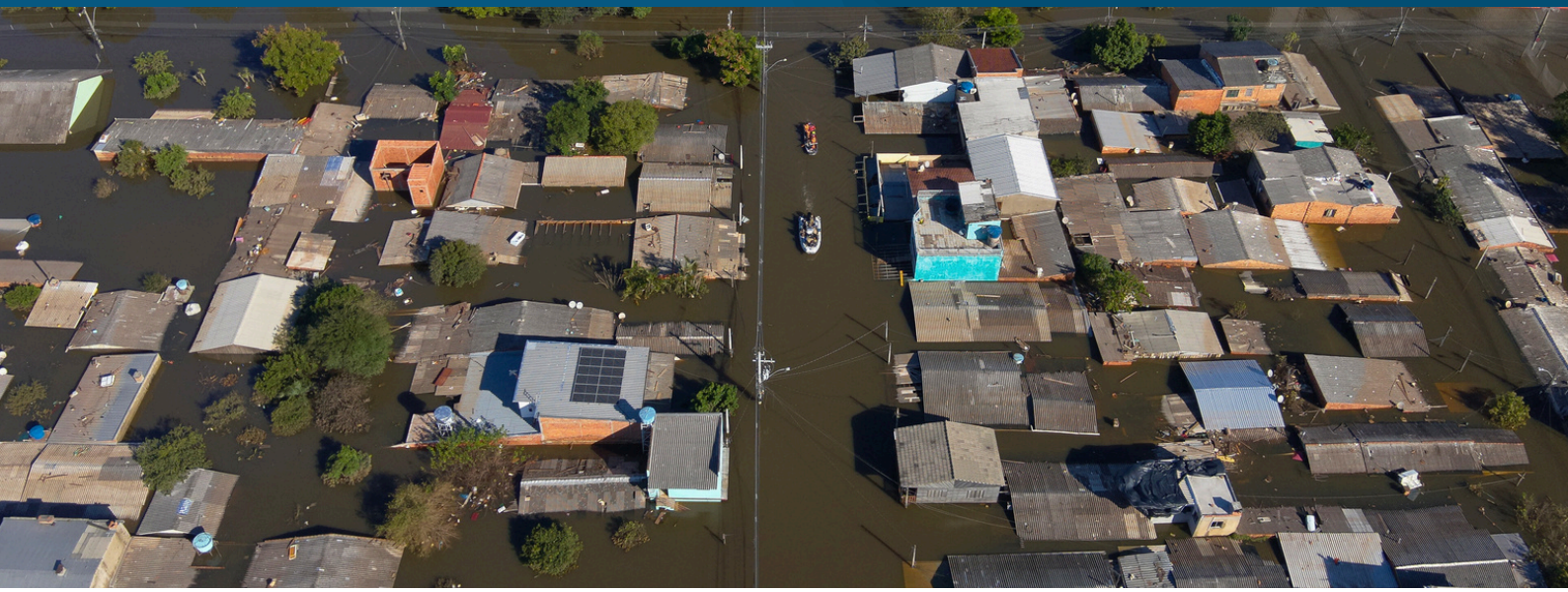
To date, floods have left 173 people dead and 38 missing in Brazil's southernmost state. More than 615,000 people have been forced to flee their homes, and it remains unclear how many will ever be able to return. The region has witnessed devastating impacts across 93% of its municipalities, with both rural and urban areas profoundly affected.

The flooding severely disrupted transportation infrastructure, leading to the indefinite closure of Porto Alegre's main airport and major highways due to landslides, washed-out roads, and collapsed bridges. Furthermore, widespread blackouts exacerbated the challenges faced by communities already grappling with the aftermath of the disaster.

In addition to the immediate threat posed by the floodwaters, there is growing concern about the spread of waterborne diseases and the strain on healthcare facilities. Over 3,000 health establishments — hospitals, pharmacies, health centers, and private clinics — were affected.

In response to this dire situation, both President Luiz Inácio Lula da Silva and Governor Eduardo Leite have been actively engaged, with President Lula personally visiting the affected areas and Governor Leite urgently appealing for immediate aid. Despite these efforts, rescue operations have been hindered by the severity of the flooding, limiting the effectiveness of deployed helicopters.

Governor Leite underscored the imperative for a comprehensive reconstruction strategy akin to a "Marshall Plan" to rebuild infrastructure and mitigate the impact of future climate disasters. This recognition highlights the urgent need for coordinated and sustained support to address the long-term challenges facing the region in its recovery efforts.



HELP.NGO RESPONSE

Leveraging our prior experience in Brazil and our established connections with local authorities as well as AWS personnel, Help.NGO mobilized resources and Subject Matter Experts (SMEs) to support government agencies responding to the crisis in Rio Grande do Sul.

TO EMERGENCY COORDINATION AND PLANNING

The deployment began with comprehensive assessments of the situation, including meetings with local authorites and field visits to determine priority locations for support and to evaluate the extent of the damage and how Help.NGO might assist local responders. This included working with government counterparts and Samaritan's Purse to help facilitate the landing of a Boeing 757 carrying 20tons of relief goods.

RAPID RESPONSE DEPLOYMENT

Help.NGO deployed a specialized team, comprising a coordinator, experienced drone operators, logisticss specialists, and a communication officer to support ongoing operations.

HELP.NGO RESPONSE

UAS ASSESSMENT AND MAPPING OPERATIONS

Help.NGO utilized several UAS to do rapid response mapping assessments around Rio Grande do Sul. The team used WebODM (an open-source platform for processing drone data) hosted on AWS Cloud to process the data and, Help.NGO was able to generate detailed maps and models of the affected areas, aiding in the identification of water entry points, assessment of flood extent, and prioritization of response efforts.

WATER LEVEL MONITORING & VOLUMETRIC ANALYSIS WITH DRONES

Drones were deployed to monitor water levels in affected areas, providing critical support for search and rescue operations. This included identifying humanitarian aid and rescue access points and routes, thereby further facilitating relief operations. Real-time monitoring helped identify areas at risk of flooding and informed evacuation efforts, enhancing overall disaster response and management.

Working with Canoas City hall, the team conducted flights over the Fatima, Rio Branco, Niteroi, Matias Velho, and San Luis areas to provide daily updates on the water levels. This information was then used to place extraction pumps to begin sanitationa nd reconstruction work. Additionally, together with Canoas City Hall and Brazilian Civil Defense, Help.NGO assisted with damage inspection across 1050 city blocks to verify the status of affected homes. These assessment flights are ongoing. Additionally, areas used as garbage dumps were mapped to determine the volume of solid waste in each. The support activities with Canoas personnel have concluded, resulting in over 450GB of images uploaded to AWS S3.

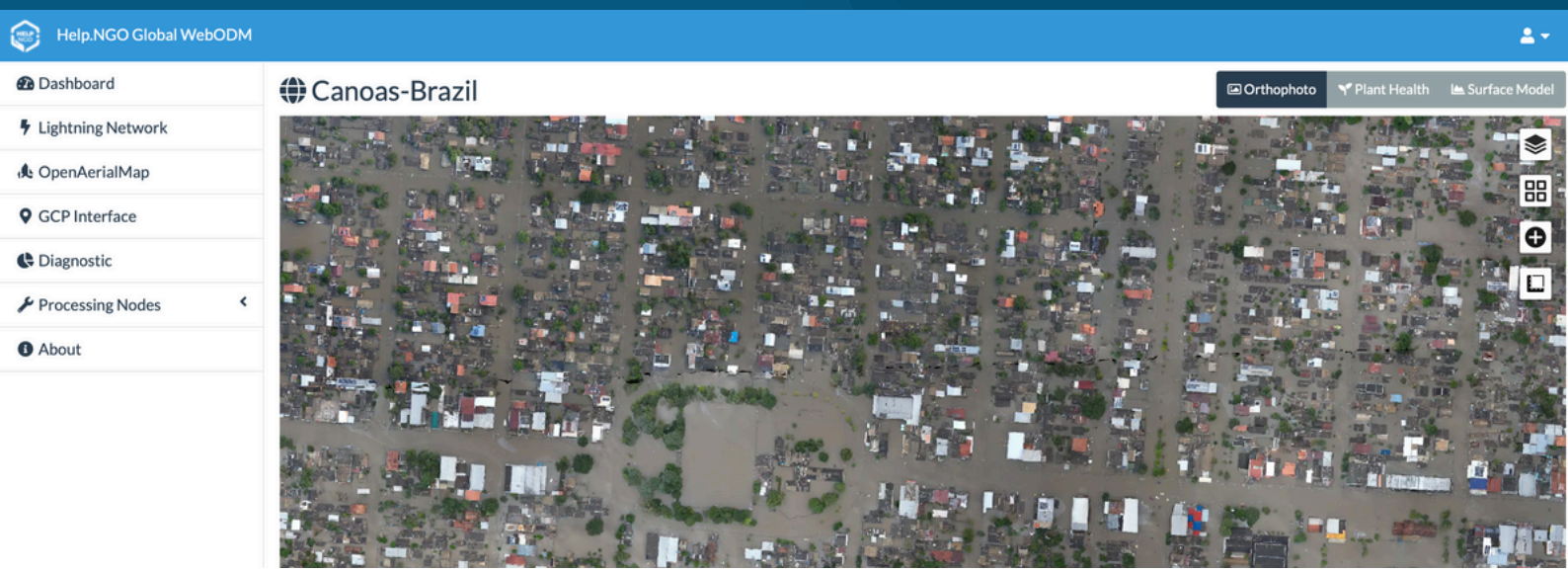
HELP.NGO RESPONSE

SEARCH AND RESCUE MISSIONS

In addition to mapping and monitoring, Help.NGO supported local authorities in conducting search and rescue operations for victims who chose to remain in their homes or became trapped during the flooding. The use of thermal cameras on Help.NGO's UAS aided in the faster location of these individuals, leveraging thermal imaging capacity, allowing quicker assistance by local authorities.

DATA ANALYSIS

AWS capabilities were leveraged by Help.NGO to analyze UAS imagery for a variety of purposes, including needs assessment, targeted response efforts, and coordination in disaster response. This utilization, particularly in areas with limited connectivity, facilitated efficient processing of large datasets, enhancing decision-making and coordination throughout the crisis.



HELP.NGO RESPONSE

LOCAL COOPERATION

Help.NGO collaborated closely with Civil Defense representatives and government officials to enhance disaster response and recovery capabilities. Building on previous work in Brazil, the integration of AWS cloud services facilitated the seamless handling of large datasets, supporting situational awareness and informed decision-making throughout the crisis. The collaboration with local entities was crucial for prioritizing areas for intervention, obtaining flight permissions, and coordinating with other organizations involved in the response.

SUPPORTING HUMANITARIANS

Help.NGO cooperated with World Central Kitchen (WCK) to create a comprehensive situational report using drone insights, including photos processed with WebODM on AWS servers. This report played a crucial role in assisting WCK to grasp the current state of the affected areas, empowering them to strategically plan and execute their relief efforts, providing essential food and support to the affected communities.

Photo credit: WCK

CONCLUSIONS

Help.NGO's response to the flooding in Rio Grande do Sul demonstrates our commitment to providing timely and effective humanitarian assistance. By leveraging advanced technologies, established partnerships, and expert personnel, we aim to mitigate the impact of this disaster and support the local responders and affected communities in their recovery efforts. Our collaboration with AWS and local authorities ensures a coordinated and strategic approach to addressing the immediate and long-term needs of the region.

The situation remains dire as heavy rains continue and are still expected, with forecasts indicating further rainfall, strong winds, thunderstorms, and possible hail. An incoming storms pose additional threats, highlighting the need for ongoing vigilance and support. Extreme weather events are becoming more frequent and devastating in Brazil, underscoring the importance of resilient infrastructure and comprehensive disaster preparedness.

Help.NGO plans to continue its support in the region by reassessing the needs on the ground and implementing additional interventions as necessary.
This includes both immediate response actions for ongoing emergencies and after-action assessments to inform future operations. Based on the gap assessment, Help.NGO will collaborate with AWS to leverage cloud computing resources for enhanced data analysis and situational awareness. Additionally, Help.NGO will develop strategies for continued operations in Brazil and explore opportunities for long-term resilience-building initiatives, including working with account team and country focal points at AWS to ensure continuity of operations. .

PETRÓPOLIS LANDSLIDES 2022 RESPONSE

In 2022, Help.NGO responded to the devastating landslides in Petrópolis, Rio de Janeiro. This disaster, characterized by heavy rainfall and unprecedented landslides, resulted in the loss of over 230 lives and inflicted significant damage. Upon receiving a formal request for assistance from the local authorities, Help.NGO and AWS mobilized resources and personnel within 48 hours. The team quickly organized equipment, logistics, and personnel to ensure a rapid and effective response to the unfolding crisis.

Despite the challenging terrain and adverse weather conditions, Help.NGO's drone pilots conducted comprehensive mapping missions over Petrópolis. Over several days, the team generated detailed 2D and 3D maps and models of the affected areas, providing invaluable data for response planning and recovery efforts. With the utilization of AWS Snow devices, the team was able to expedite the imagery processing pipeline, creating high-resolution maps and models of the damaged areas in real-time.

Collaborating with AWS, Help.NGO supported Brazil's State Environmental Institute (INEA) in secure data storage and analysis of historical weather and radar data. AWS cloud computing capabilities played a crucial role in processing and collating weather information, enhancing INEA's understanding of local weather patterns and aiding in disaster forecasting and mitigation.

Building on our response in Petrópolis, Help.NGO has continued to foster relationships with local authorities and AWS, ensuring ongoing support and collaboration. This engagement serves as a testament to our commitment to leveraging technology and expertise to assist communities in times of crisis.

To learn more how Help.NGO and AWS responded to Petrópolis landslides in 2022, scan the QR code or click here.

Scan the QR code to see
more photos from this mission.

#TechnologySavesLives

May 27, 2024