

# Into Action

## Inclusive early warning and response systems in Honduras

Protecting Villanueva and El Progreso  
against landslides and flooding



Edited by Christian Barthelt, Renate Bleich, Anna Zerhoch



# Early warning for all

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The Munich Re Foundation supports the global campaign Early Warning for All, initiated by the United Nations Office for Disaster Risk Reduction (UNDRR) and the World Meteorological Organisation (WMO). The aim is to bring all people worldwide under the protection of disaster warning systems by the end of 2027.



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# The project

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At the beginning of 2024, we entered into a new partnership with the renowned Irish organisation GOAL. They are active in climate resilience actions worldwide. We spent one year supporting one of their disaster prevention projects in Honduras to further develop and implement a holistic early warning system against floods and landslides.

On the technical side, rain gauges and other weather observation equipment were successfully installed. Better data enables better risk assessment. At the same time, existing voluntary emergency committees in Villanueva and El Progreso received trainings, whilst further groups were set up. The third step involved improving the entire communication system in the communities, encompassing automated technology, science, the local authorities and residents.

The communication technologies are now being used to monitor, forecast, disseminate and transmit warnings to the affected local communities in the event of an emergency. The main aim of the project was to reduce the disaster risk for the two communities and increase the resilience of the local, vulnerable population.

The main risk in El Progreso is flooding, while people in Villanueva have to contend with massive landslides. Both risks are highly likely to be exacerbated by climate change. This IntoAction will present further details on the project and showcase how resilience can be built in low-income, vulnerable neighbourhoods using participative and inclusive approaches.



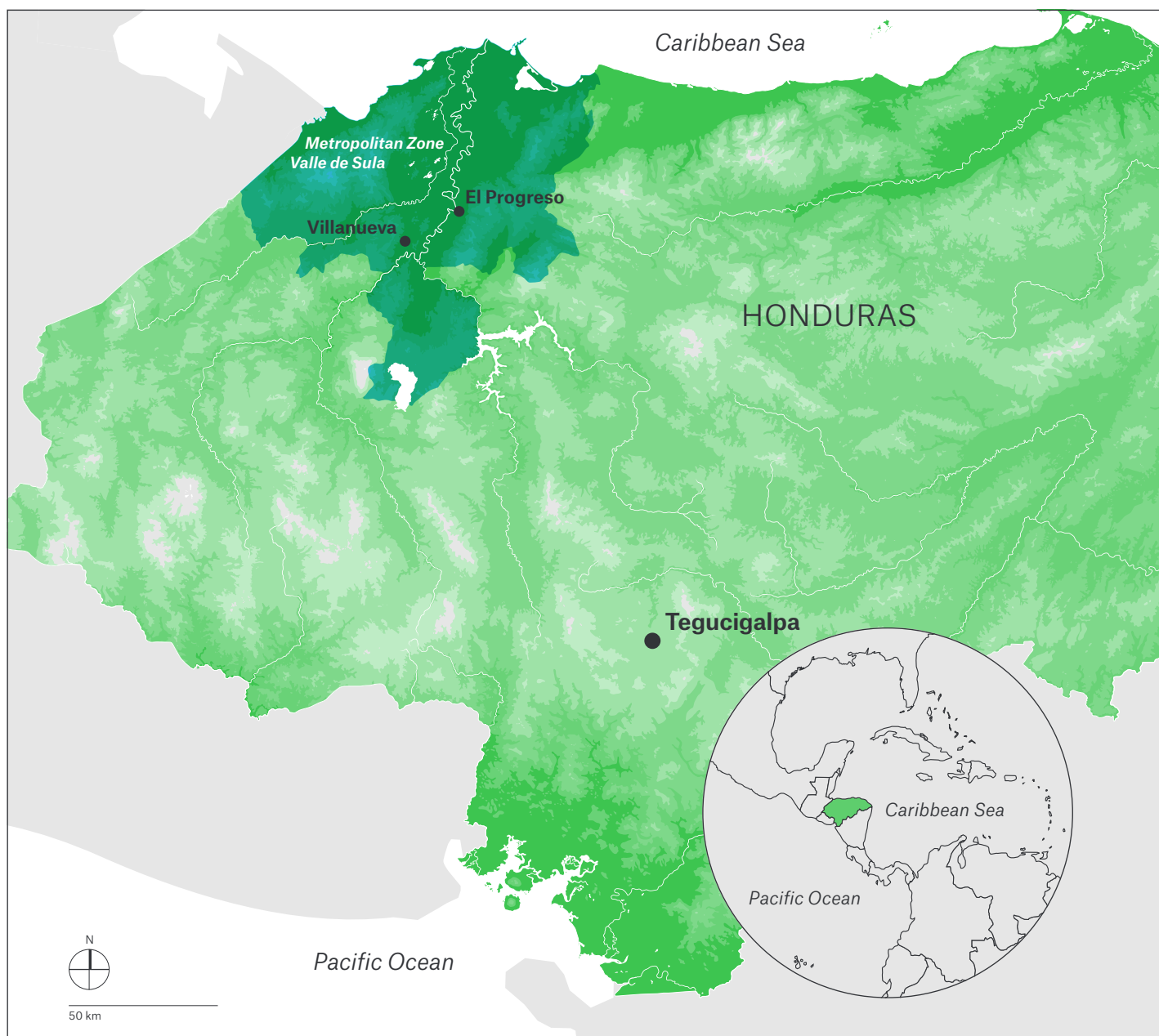
*“At the beginning of the project, it was painful for me to see how apathetically many people living in the communities, especially in El Progreso, accepted the immense risks from flooding and landslides. It was clear to me that we could contribute to a real change in thinking here with a major communication campaign. I am glad that we were able to achieve this success as part of the project.”*

**Kimberly Rivera**  
Programme Support Officer for  
GOAL Honduras



# Risk assessment in Villanueva and El Progreso

The Metropolitan Zone of the Valle de Sula (ZMVS) is located in the largest valley in Honduras. It is one of the largest conurbations in Central America, housing 23% of the country's total population. And it is an area of considerable economic and industrial growth, responsible for producing 63% of the country's GDP. The municipalities of Villanueva in the department of Cortés, and El Progreso in the department of Yoro, are part of the ZMVS and they are the boroughs with the largest population after the municipality of San Pedro Sula.





El Progreso is 77% urbanised with an approximate population of 200,000, while Villanueva is 85% urbanised with an approximate population of 182,000 inhabitants. The urban centre of El Progreso is located to the east of the ZMVS on the right bank of the Ulua river and in the foothills of the Mico Quemado mountain range, only 28 metres above sea level. Villanueva is located to the west of the Ulua river, with a similarly low elevation, just 23 metres above sea level. This makes both municipalities prone to flooding, with Villanueva in particular also prone to devastating landslides.

### **Tropical storms as constant risk factors**

In November 2020, tropical storms ETA and IOTA caused extensive damage in El Progreso and Villanueva. The severity of the impact is due to the combined effect of unplanned urban growth, environmental degradation and the region's low preparedness and response capacity. In total, around 300,000 people and almost 60,000 families in El Progreso, as well as 14,000 people and 3,200 families in Villanueva, were displaced and affected.

In Villanueva, three months after ETA and IOTA, families who had already returned to their homes had no choice but to return to the emergency shelters again: they had now lost their jobs as the storm damage had led to the closure of many industrial and manufacturing businesses – and homes were still partially destroyed. The loss of livelihoods and homes in areas such as El Progreso left many families living in precarious conditions. Small tents became their new homes, as their neighbourhoods were otherwise uninhabitable. Poverty levels in the region rose significantly.

In 2022, during Storm Julia, the disastrous scenes were repeated, affecting more than 43,000 people (8,600 families) in El Progreso and 4,000 people (800 families) in Villanueva. This data shows that local governments are still struggling with disaster prediction and safe recovery processes for communities in the ZMVS area. Action is urgently needed.

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# The importance of early warning systems

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IPCC reports, calls for action by aid organisations, scientists from all over the world, and the statistics from recent disasters make one thing very clear: If we do not intensify our efforts to slow down climate change, the habitability of large areas in vulnerable regions of the world is at stake. Further severe consequences of climate change are already obvious today. These include an increasing number and intensity of disasters in a large number of regions: flash floods, heavy precipitation, storms, droughts, heat waves and much more.

Consequently, in addition to mitigation efforts, societies need to better prepare and adapt to the increasing risks. Early warning systems are an important strategic asset for disaster risk reduction and resilience building. But almost one-third of the world's population, mainly in the least developed countries and small island developing states, are still not covered by early warning systems.

That's why the United Nations announced an ambitious target in March 2022: "By 2027, everyone on Earth should be protected by early warning systems against increasingly extreme weather and climate change." The important role played by early warning systems in the disaster risk management toolset is also reflected in the Sendai Framework. Here, the UNDRR states that:

*"An early warning system is an adaptive measure for climate change, using integrated communication systems to help communities prepare for hazardous climate-related events. A successful EWS saves lives and jobs, land and infrastructures and supports long-term sustainability."*

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The four key elements of early warning systems are:

- 1 Disaster risk knowledge
- 2 Detection, monitoring, analysis and forecasting of the hazards and possible consequences
- 3 Warning dissemination and communication
- 4 Preparedness and response capabilities



# Fighting landslides in Villanueva

In its upper part, Villanueva is particularly prone to landslides triggered by heavy rainfall, soil saturation and water runoff. This is why a network of rain gauges has been installed. Based on the data generated by the rain gauges, the community receives warnings as soon as critical thresholds are reached, indicating a heightened probability of landslides. The sustainable installation and constant work of the gauges enable real-time risk monitoring.

In order to broadcast the alerts and the results of the technical monitoring system, as well as to disseminate other information on relevant Disaster Risk Reduction (DRR) options, an app was developed that is specifically tailored to the needs of Villanueva's inhabitants. Moreover, four local businesses were selected to serve as information centres by hosting digital screens constantly providing DRR information. This allows these four businesses to contribute to increasing the visibility of the community's early warning system.



## Fighting landslides in Villanueva

### CODEM & CODEL – The heart of the system

The pre-existing Municipal and Local Emergency Committees (CODEMs & CODELs) established by volunteers in both municipalities were actively involved in the project. At a range of different workshops, members of these committees were trained on how to manage the rain gauges, to maintain the hardware of the warning system, as well as how to use the app and explain it to others. These committees play a key role in disseminating DRR information, as they serve as the ultimate link between technology and the people at risk.

In Villanueva, there are now four functioning CODELs with 40 volunteer members. In an emergency, they are responsible for communicating and providing organisational support for the evacuation process. They inform their respective neighbourhoods about the early warning system and can provide first aid. They also provide support for the maintenance of the technical system. Of the 40 volunteers, 22 are women. Four neighbourhoods are integrated into the system: Miguel Yáñez, Las Lomas, San Ramón, El Pedregal.

The CODEMs are official risk management committees appointed by the local administration within the municipalities. They are responsible for further developing the warning system, integrating it into municipal policy structures, and long-term public financing. They were also trained on the backend tasks of the technical system and the app.





## Fighting floods in El Progreso



Located directly next to the Ulua river and additionally crossed by the Pelo river, El Progreso is mainly at risk of flooding. Accordingly, a hydrological and hydraulic model of the Pelo river had been developed as a first step in order to understand the hydrodynamics of the river. Further data was provided by the Centre for Atmospheric, Oceanographic and Seismic Studies (CENAOS). With the help of the model, different flood scenarios could be tested and effective adaptation measures were then identified. Limnimeters were attached to bridges along the Pelo river in the project area, meaning that water levels can now be easily read. Critical threshold readings have been made more clearly visible, and these thresholds are used to generate early warning alerts against flooding.

Various training sessions and workshops were conducted to educate community volunteers on hydrological risk assessment, especially in densely populated urban areas. Moreover, like in Villanueva, an app was developed and six additional promotional DRR screens were placed in four selected businesses and two offices of the local taxpayer service.

In addition to publishing alerts and other important DRR information, the above-named app “Todos Somos El Progreso” includes a participatory digital mapping tool. This collaborative mapping enables a faster and more efficient response to flood events, as the location of affected areas, as well as of temporary shelters, can be displayed and disseminated easily. The tool is supervised by the Municipal Emergency Committee (CODEM) and is used by the voluntary Local Emergency Committees (CODELS) in the flood-prone neighbourhoods of El Progreso.

## Fighting floods in El Progreso

### Communication via a preachers' campaign

Community engagement and participation were key elements of the successful project implementation. With this in mind, activities included measures to strengthen the Local Emergency Committees in El Progreso in particular. An initial lack of engagement was resolved by acquiring new members, e.g. via a "DRR preachers' campaign". Volunteers, mainly women, went from door to door, explaining the rationale and the purpose of the intended warning system, and why participation by as many volunteers as possible was key. The Committees were also supplied with important equipment and tools aiming to improve their response capacity.

The results are impressive: At the start of the project, there were only four CODELs with a minimum number of members in the nine neighbourhoods of the project region. The information campaign significantly increased the level of active participation in the community. Today, there are a total of nine CODELs with 69 members, 53 of whom are women.

The existing CODELs were also further strengthened by receiving additional training and better emergency equipment. This scaling-up has significantly increased the visibility and relevance of the warning system in El Progreso, and it now helps to increase resilience to climate risks.

18,000

locals directly reached  
with DRR communication





## Participation, inclusion and localisation are key



The project in Honduras is constantly monitored to measure the acceptance and impact of the actions. In both communities, a large survey was launched as part of the work. The questions were aimed, in simple terms, at finding out what local residents' needs for protective measures are, how they assess the general political efforts to protect them, and what role the new system can play in this process.

The result was quite clear: A very large majority know that they need more protection in the face of increasing and imminent hazards. In Villanueva, around 63% of those surveyed are aware that the municipality is already undertaking DRR efforts, but only 57% of those surveyed consider the efforts to date to be sufficient. The GOAL project addresses both of these statements: With the new EWS, measures to protect the population in the project region are being expanded significantly. The tangible mistrust towards politically triggered interventions can be reduced through clear, transparent and participatory approaches. If the voices of the locals are heard in the decision-making processes and

integrated into planning from the outset, this increases the acceptance of DRM measures and their visibility and ultimately their success. Participatory processes may appear more laborious at the beginning, but they pay off through sustainable success later on.

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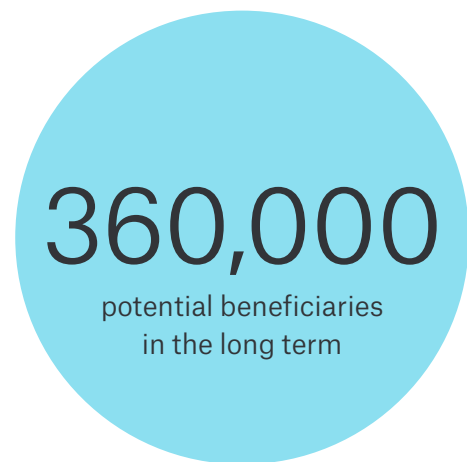
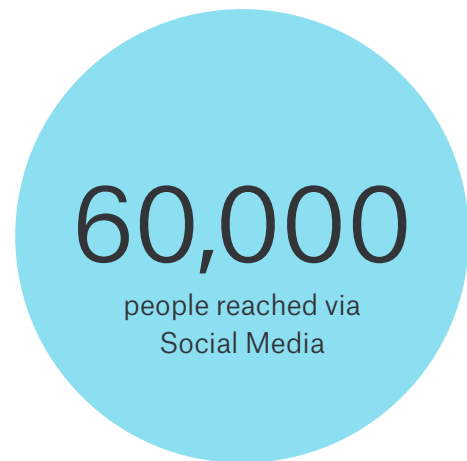
training sessions for  
over 100 participants  
organised

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Participation, inclusion and localisation are key

### Alarming results from the survey

In El Progreso, the results of the survey painted an even more critical picture: only 47% of respondents were aware that DRR measures were already in place in their area. Accordingly, well over half of the survey participants indicated that they were not satisfied with the status quo of the protective measures. GOAL took this as an opportunity to focus more on participatory processes and to intensify its efforts to promote participation in the system. As a result, the number of CODELs in the nine neighbourhoods of San Martín, 2 Julio, Fátima, Centroamericana, Policarpo Paz, San Miguel, Suyapa, Penjamo and Palermo has more than doubled. Here, too, the key was the direct involvement of, and transfer of ownership to, local volunteers.



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## Localisation

The term “localisation” in connection with DRR is increasingly and quite rightly receiving attention. In contrast to conventional, often nationally-controlled disaster risk reduction, localising DRR is about using individual local capabilities. Traditional local knowledge can also play a role here. The aim is to involve all stakeholders in the community in order to exploit innovation potential, but also to integrate the special needs of otherwise marginalised groups from the outset. Community-based approaches play a major role in localisation: People who are directly affected by disasters work with facilitators to find local solutions. These solutions are tailor-made, meaning that the people affected become not only passive beneficiaries of a DRR system, but also its active designers.

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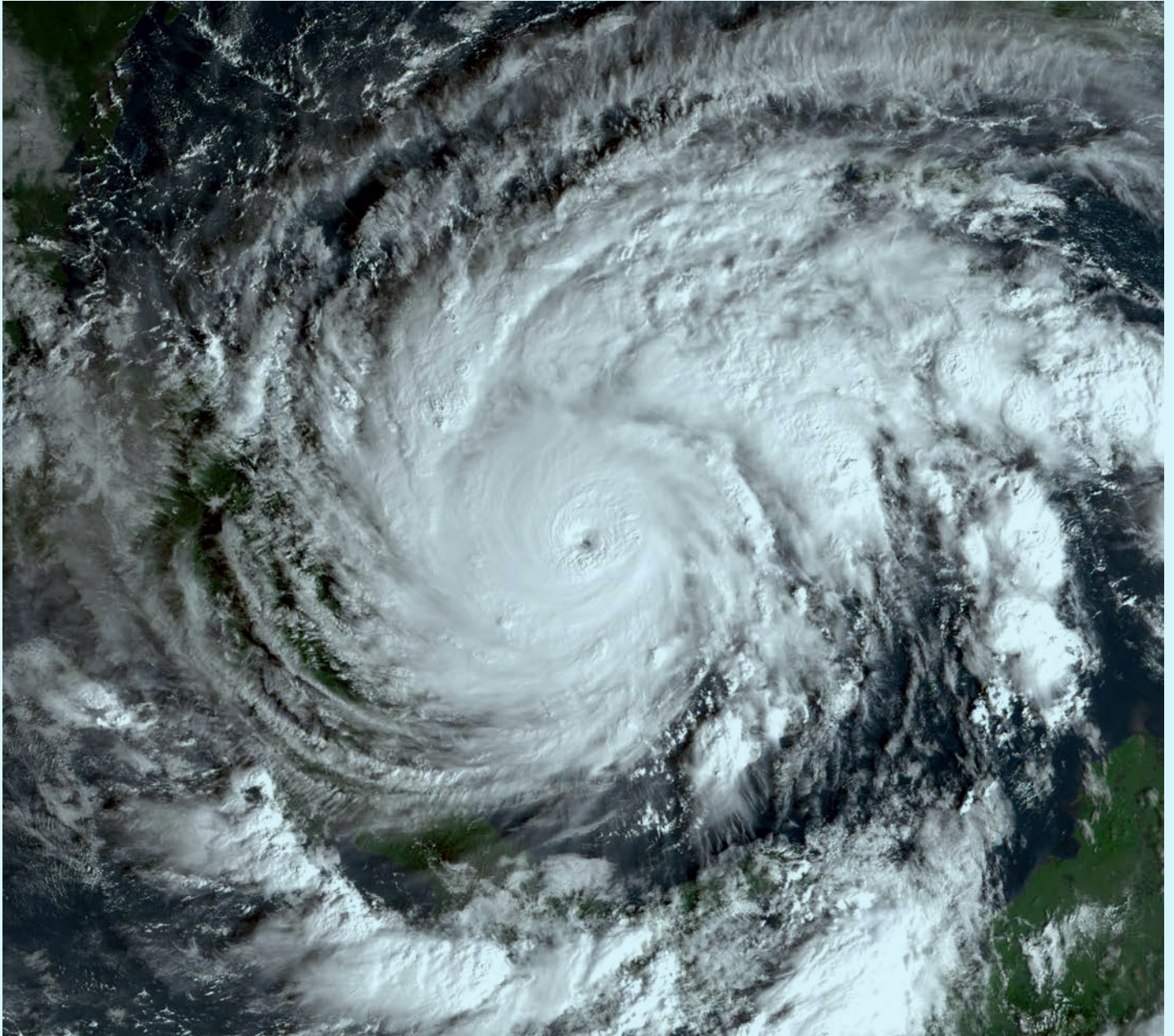
## Inclusion

In our project area, inclusion has played an important role, especially with regard to older community residents. In data collection, opinion polls and more, they are often underrepresented because data collection today often involves modern information and communication technologies. These cannot always be used by the older generation. As a result, they are left out of risk assessment, solution finding and, ultimately, resilience building. This is why a tailored DRR Preacher campaign was launched as part of the project. Volunteers from the CODELs went door to door in the neighbourhoods with printed flyers, presentations and posters specifically tailored to older generations, and reached hundreds of otherwise neglected elderly people with this elaborate campaign.



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## Impact and an early unexpected functional test



### **Storm Sara – the first emergency**

The training and expansion of the warning system by GOAL and local officials was successfully completed just in time at the end of 2024. In November 2024, the newly installed early warning systems underwent their first real-world test: Storm Sara hit the region, involving heavy rainfall and consequently a high risk of landslides. Fortunately, based on the data supplied by the rain gauges in Villanueva, inhabitants of vulnerable areas were warned by the Municipal Emergency Committee, followed by a preventive evacuation. Due to the real-time and precise information provided by the monitoring system and

the highly effective collaboration between those in charge of its management, potentially disastrous consequences of storm Sara were prevented and loss of life averted. Zero fatalities occurred in the project neighbourhoods despite active landslides being triggered. In short, the system performed its primary function at all levels and has proved a successful effort to implement a well-functioning risk management system.

**Sustainability assessment of risk management systems**

Our project partner GOAL is involved in significantly larger DRR projects in Honduras and worldwide. To assess the impact of these projects systemically, GOAL uses a five-level approach to evaluate the quality of early warning and disaster management systems. In an ideal case (level 5), the local warning systems function robustly and sustainably and require only minimal external input, be it in the form of knowledge, technology or financing. Further support may be needed only if new, previously unforeseen disasters occur. At the other end of the scale is level 1: In this state, the community has not installed any risk management systems of its own. If these systems ever existed, they have broken down, and disaster risk management depends entirely on external actors, such as humanitarian relief organisations. The project in Honduras raised the situation in Villanueva and El Progreso from level 1 to level 3. The system itself works locally, ownership has been transferred, and the technology is robust and sustainably established. However, longer-term financing cannot be handled locally due to a lack of public funds. There is no improvement in sight, as the budgetary situation in Honduras is precarious. This means that actors such as GOAL will remain in the country and offer support.



*“We, at GOAL Honduras, are so hugely grateful for the support of the Munich Re Foundation, which will see the inhabitants of Villanueva and El Progreso better prepared for, and with better functioning systems to predict and evacuate from, dangerous floods and landslides. The biggest relief for me was to see how the new EWS performed during storm Sara and that we could indeed save hundreds of lives!”*

**Brenda Antunez**  
Disaster Risk Reduction Manager,  
GOAL Honduras

	Level 1	Level 2	Level 3	Level 4	Level 5
Context	Local systems collapsed and completely dependent on external support	Local systems weak and unable to cope. External support needed	<b>Local systems coping but need some external support</b>	Local systems mostly functioning. External support minimal	Local systems robust and fully functioning
GOAL response	Life-saving humanitarian relief	Humanitarian relief and provision of surge capacity to stabilise local systems	<b>Provide surge support within local systems</b>	Only work within local systems where gaps exist	Targeted support for unforeseen/new emergencies



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# Outlook

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The project's future prospects were discussed with local project managers. One major hurdle was mentioned, but at the same time two very promising developments were highlighted:

- 1 The long-term financing of the warning system will continue to rely on external donors in the future. Despite many efforts, local political resources are not sufficient to finance the system. Now that the technical installation is complete, however, the majority of the costs have already been covered. The subsequent costs are manageable in comparison and mainly relate to the maintenance and management of the data collection system and the communication channels. The project described here is embedded in the larger GOAL Barrio Resiliente project in Honduras, funded by a variety of partners, which aims to strengthen resilience and adaptive capacity to climate risks nationwide.
- 2 Since the technical basis has been installed, the project can be scaled up to other neighbourhoods and communities without any major financial outlay. In the level assessment in the previous chapter, we saw that the status in our project region is at level 3. To reach levels 4 or even 5, stable long-term financing would have to be achieved first, which is not likely in this case. This means that financing issues remain the main bottleneck for sustainable development according to the 5-level evaluation. However, the financing requirements for further scaling in this project are very manageable. As a result, the project team expects the project to grow significantly in the coming months and years.

3 The first signs of this scaling are already visible today: the EWS communication materials are being passed on by the CODEL volunteers to new neighbourhoods that have not yet been involved in the project. Due to the acute climate threats, there is considerable interest amongst the local population in increasing disaster preparedness. This work within the neighbourhoods is already functioning without much external moderation by GOAL staff members. The idea of voluntary CODELs is also increasingly winning over local stakeholders. The localisation approach is paying off. Precisely because there is too little support from state institutions, people feel more strongly that they want, and indeed need, to act themselves. The establishment of CODELs also involves only minimal costs.





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# Imprint

## Project partners

### *GOAL (Implementing Organisation)*

GOAL is an international humanitarian response agency established in Ireland over 40 years ago as a non-profit organisation (Registered Charity No. 20010980; CHY 6271). GOAL's purpose is to save lives and empower communities to develop resilience and greater control over their lives and livelihoods. GOAL aims to increase the resilient well-being of the world's poorest people and focuses on those who are excluded or marginalised, particularly those who are vulnerable due to socio-economic status, gender or age.

### *Munich Re Foundation (Donor)*

The Munich Re Foundation is an independent, non-profit organisation founded by Munich Re in 2000. People are ultimately at the core of the foundation's work. The foundation's task is to prepare people for the risks they are exposed to, and to minimise these risks wherever possible. It clarifies issues and provides support, mainly in developing countries. In dialogue with partners worldwide, Munich Re Foundation stimulates ideas and creates perspectives.

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