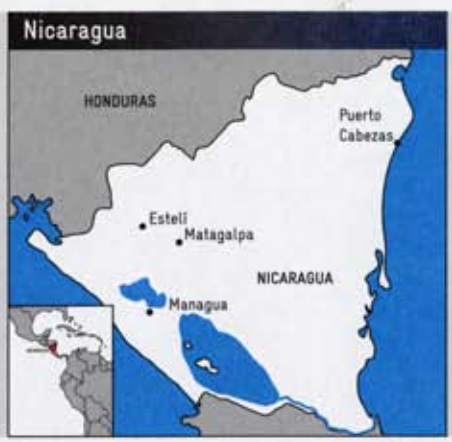


## Project data

| | |
|---|---|
| Client: | German Federal Ministry for Economic Cooperation and Development (BMZ) |
| Project region: | Tola municipality, Rivas department, Pacific coast of Nicaragua |
| Implementing organisation: | GTZ programme Sustainable Resource Management and Promotion of Entrepreneurial Competence (MASRENACE) |
| Overall term: | October 2006 to March 2007 |
| Contact: | disaster-reduction@gtz.de |

# Nicaragua: Tsunami warning system

## A component of sustainable tourism promotion

### Context

The municipality of Tola on Nicaragua's Pacific coast is an increasingly popular destination for tourists from both Nicaragua and abroad. The municipality has been overwhelmed by the spontaneous and unchecked boom and is attempting to use spatial planning and a tourism plan to make the development sustainable. In Nicaragua, land-use planning is in its infancy. For this reason, the Tola municipal administration is receiving support from the GTZ programme Sustainable Resource Management and Promotion of Entrepreneurial Competence (MASRENANCE).

A particular challenge involves the inclusion of risks posed by extreme natural events in land-use and tourism planning. Nicaragua is exposed to a number of geological and meteorological hazards, of which earthquakes, landslides and tsunamis set off by seaquakes are particular threats to Tola's coastline. Back in 1992 a tsunami claimed the lives of 25 people and hundreds of people lost everything they owned. Although settlement has substantially increased since the tsunami, the population and tourists have not been made aware of the risks, nor have contingency plans for an emergency been put in place. Instead, Nicaragua's mangrove forests continue to be overexploited, despite their recognised capacity to serve as a buffer in the case of a tsunami. On the other hand, the awareness that disaster risk management measures are needed is increasing. This also applies to Tola, where the municipal administration declared sustainable development planning and the establishment of a tsunami early warning system to be urgent.

### Project

MASRENACE has supported the municipality of Tola since 2005 in its development planning, and takes natural hazards into account in the process. To date, Nicaragua has had extremely limited experience with tsunami early warning systems. For this reason, the need identified in Tola was addressed by a pilot measure for Astillero and Gigante, two especially vulnerable areas within the municipality of Tola, as part of the six-month project. The tsunami early warning system was integrated in the development planning process and can be extended to other areas by the municipality and national institutions.

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On behalf of Federal Ministry for Economic Cooperation and Development

The project strengthens the population's self-help capacities and enhances interinstitutional coordination beyond the Tola municipality as well as the use of suitable technology. A local process for awareness-raising, advanced training and self-organisation was launched that drew on the country's limited experience in close cooperation with the national authorities. The local development committees, the tourism sector, the emergency committee, as well as young people and victims of the tsunami of 1992, played a key role in drawing up risk maps and evacuation routes. The participants' interest in and commitment to operating the tsunami early warning system on a long-term basis and to further strengthen it, constitute the system's major strength. Nevertheless, the local system needs to be integrated into national structures. The link between the system and INETER, the national institute for territorial studies, is at the centre of this integration at the institutional level. INETER takes the information recorded by the seismograph, which was installed by the project on the coast of Tola, and enters it into the national information network. The data is analysed along with the data recorded by other seismographs in the country and international information on seaquakes, and that information is used to decide when and how to issue tsunami warnings for the inhabitants and tourists in Tola. INETER uses the radio or internet to transmit the warnings to Astillero and Gigante, where automatic sirens installed at strategic locations warn the population directly about the threat of a tsunami. At the same time, local actors receive detailed information via walkie-talkies and can coordinate subsequent steps with INETER.

However, for a tsunami early warning system that calls for people to respond to warning sirens quickly and appropriately, it is not enough for only the involved committees to know what to do. All inhabitants and all providers within the tourism infrastructure need to internalise how to act in an emergency, and all tourists need to be aware of the potential danger in order to be prepared when the warning signals are issued. Hence the project launched an extensive readiness plan by producing flyers and sponsoring awareness-raising events.

## Results – What was achieved?

During the brief term of the project, the organisational and technical foundations for the tsunami early warning system were laid. The population, municipal administration and tourism committees have taken responsibility for risk zoning, linking the system with INETER at the institutional level, and organising evacuation procedures and emergency aid. Awareness-raising material is now available for the population, a sign that great strides have been made.

MASRENACE and the local partners are aware, however, that a great deal remains to be accomplished to guarantee an early warning system that is effective in the long term. Plans are in place to regularly perform disaster risk management drills and distribute information material to raise the awareness of the local population and tourists in Tola. In addition, MASRENACE will support the municipal administration in including the system in municipal land-use planning and tourism development, and it will reinforce communication with INETER. While it may take some time for the system to operate reliably, it has already proven to be an interesting and cost-efficient initiative for many coastal areas.

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