impossible to find mathematical models on which to base and analyse them. For this reason, the formulae used are empirical and based on observations of phenomena that have occurred in Japan.

In the case of the coast of south-western Peru, the problem becomes even more complicated, since the epicentres of tsunamigenic earthquakes are located near the coast and the source area of the tsunami often spans low-depth or even continental waters. So far, the minimum depth of water required for elastic strain energy to be effectively transmitted from the ocean floor to the water mass is unknown. This problem apparently also occurs on the central coast of Chile. The March 1985 earthquake, with a magnitude of 8 and an epicentre near the coast, produced a tsunami that reached land in only 5 minutes, but was not very high.

El Callao was lashed by tsunamis from sources close by on six occasions from 1535 to 1994. All of them had different effects on the port. Calculations of arrival time of the first wave, wave height and boundaries of the flood zone correspond to those of the earthquake-tsunami of 28 October 1746, the most destructive of all. El Callao, a long, low peninsula, is extremely vulnerable to tsunamis, and in 1746 4,600 of its 4,800 inhabitants perished.

Despite the limitations indicated, the data contained in table 1 provide very useful information:

- For the preparation of emergency evacuation plans in areas liable to flooding, and
- For disaster mitigation through land-use planning.

The towns studied were noted to have limited inland penetration owing to the usually high altitude of coastal areas in south-western Peru. Part of the old town of Chala is subject to flooding; floods do not occur in the urban districts of Mollendo and Islay located on high ground, but the harbour area of Matarani is affected; the low-lying, sparsely populated parts of Mejía are liable to partial flooding; Ilo is the port most at risk, although maximum penetration would be some 400 metres and would take place in the area at the mouth of a dry river bed. The population could easily be evacuated from the flood zone in the time available, if a sound plan were prepared and evacuation drills were conducted regularly.

Boca del Río is gently sloped, and so the tsunami could penetrate a considerable distance; nevertheless, it is sparsely populated.

DHA/Geneva, INDECI and HIDRONAV have recently published a Tsunami Handbook containing the results of the studies conducted in the country from 1981 to 1994, in areas located between Talara, to the north near Ecuador, and Boca del Río, to the south, near Chile. The Handbook was translated and published in English.

BOCA DEL RIO, DEPARTMENT OF TACNA, A TOWN STILL IN THE EARLY STAGES OF DEVELOPMENT, HAS A GOOD OPPORTUNITY FOR ORDERLY LAND USE, GREATLY REDUCING THE RISK TO FUTURE GENERATIONS OF RESIDENTS.