Estimate of the capacity of the service of drinkable water supply through substitute water utility companies after an earthquake, in the provinces of Lima and El Callao

Responsible researcher: Eng. Jorge Vargas Florez
Research assistants: Patricia V. Ramírez Jaime, Fiorella W. Alvarez Ramos and Miguel A. Palomino Espinoza
Involved institutions: PUCP, *Cooperación Logística Solidaria*.

Department of Engineering - Industrial Engineering Section

This research seeks to show an estimate of the capacity of the service of drinkable water supply through substitute water utility companies currently existing in the provinces of Lima and El Callao, on determining the non potential served demand by the water utility company (SEDAPAL) after an earthquake.

For this purpose, it is assumed that the magnitude of a future earthquake in the provinces of Lima and El Callao could produce the cutting of public water service currently in use in more vulnerable populated areas. In such a situation, substitute water utility companies should be water processor companies and bottling water plants, as well as related services as water pumps businesses, tanks companies and reservoirs of water, transportation companies (truck tanks) and private water sources (wells, reservoirs, etc.)

Considering that only the population of Lima *Cercado, Rimac, La Victoria, Chorrillos, Barranco, El Callao and La Molina*, are critical districts due to their geological characteristics and high vulnerability, and taking into account that this aforementioned population represents the 16.92% of population of Lima and El Callao, the demand is 138 million liters of water per day. Knowing also that the surrogate interviewed water companies could not serve more than an average of 0.52 million liters/day, there is not availability to serve the affected entire population any day. At least of 267 days of stock would be required to replace the service currently provided by SEDAPAL.

It is concluded that the development of water utility companies and other products and services considered vital in humanitarian logistics sector, should be a priority issue in the supporting plans before a disaster, in which integration, coordination, service, control and management processes have to be clearly defined. A future research work will be modeling a system of linear equations; taking into account that the supply system follows a scheme for the use of resources and target with management of restrictions and a function which could result in the maximum volume of the supply of water in areas considered vulnerable.