# Editorial

An early warning system is a mechanism that through a series of variables is activated generating a notification, signal or alert to a community in general, warning of the occurrence of a natural phenomenon to happen; natural phenomena cannot be avoided because they are prodigies of the states of nature that generate substantial damage such as natural disasters that in some cases are caused by man. In most countries, if not in all of them, there is a way to warn by means of an EWS the occurrence of a phenomenon, where such phenomena can be floods, landslides, rainfall, volcano eruptions, tsunamis, tidal waves, earthquakes. These systems have helped people to take action without putting their lives and those of their families at risk, although in some cases the force of nature itself does not give time.

In Colombia there is the National Unit for Disaster Risk Management, the District Institute for Risk Management and Climate Change with the help of the Colombian Geological Service provide assistance for the prevention and attention of disasters, reduce the risk to contribute to the improvement of the quality of life of the Colombian population. All this is very important because it helps to save lives, but I am going to refer specifically to the topic of earthquakes, there are warning systems to predict them, countries like Mexico and Japan have very advanced early warning systems, while the United States system is in final tests.

Due to the subduction between tectonic plates, these generate large amounts of energy and gases generating 2 types of waves, one called P or primary waves that are longitudinal waves that travel in the same direction of wave propagation at different speeds depending on the medium, and S or secondary waves are those waves that travel or move perpendicular to the wave propagation, generating greater tension and devastating infrastructures, electrical, communication, water and gas networks, and human losses.  These early warning systems are really very advanced systems to predict the occurrence of earthquakes, but what is presided is an earth movement with a magnitude X that is about to happen after a few seconds through the P wave, because in reality the telluric movement has already happened although in some situations the arrival of the S wave is almost equal to the arrival of the P wave, leading to the fact that once the warning system is activated by the P wave, the S wave began to wreak havoc without having time to react to the event.

Many algorithms have been generated with strong bases in mathematics, statistics, big data, artificial intelligence and data mining improving every day the existing systems to predict the occurrence of earthquakes and save more lives, making this line of research a topic of interest for researchers.

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