

MECHATRONICS BOOK SERIES SYSTEM DESIGN AND SIGNAL PROCESSING VOLUME 1

Editors

**Asan G. A. Muthalif
Amir Akramin Shafie
Siti Fauziah Toha
Iskandar Al-Thani Mahmood**



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CHAPTER 17

Development of Experimental Station for Earthquake Prediction

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17.1 Introduction

December 2004 recorded a tragic scene of human suffering caused by Asian Tsunami disaster. Due to fault displacement within the convergent boundary zone between the Indian oceanic plate and the Eurasia continental plate, an earthquake results large tsunamis disaster which killed over 165,000 people in early January 2005. Relatively, only few animals have been reported dead, which revives speculation that animals somehow sense impending disaster [1].

In March 11, 2011, a 9.0 magnitude of earthquake had strike Japan which tolls 10,000 deaths. Estimated more than 434,000 people are homeless and live in shelter. The government of Japan stated that damaged due to this disaster could cause up to \$310 billion, making it the most costly natural disaster recorded.

Debate was over the scope for predicting or warning of a tsunami. In this scene, it is noted that many animals moved inland to safety before the first wave strike [1-5]. Eyewitness said that elephants screamed and ran for higher ground, dogs refused to go outdoors, flamingos abandoned their low-lying breeding areas and zoo animals rushed into their shelters and could not be enticed to come back out [6-9].

As the nature disaster cannot be stop, it is a challenge to come out with an alarm system based on macro-phenomena such as unusual animal behavior, vibration analysis, panic detection in animal, etc. However, studies show that geophysical stimuli which lead as precursor signal for earthquake; such as the change of the electric field, electromagnetic and vibration can be detected by animal and have been attributed to the reason for the unusual animal behaviors.

17.2 Methodology

Basically the whole research is to design an alarm system to notify any disaster that might occur as depicted in Fig. 17.1 and Fig. 17.2.

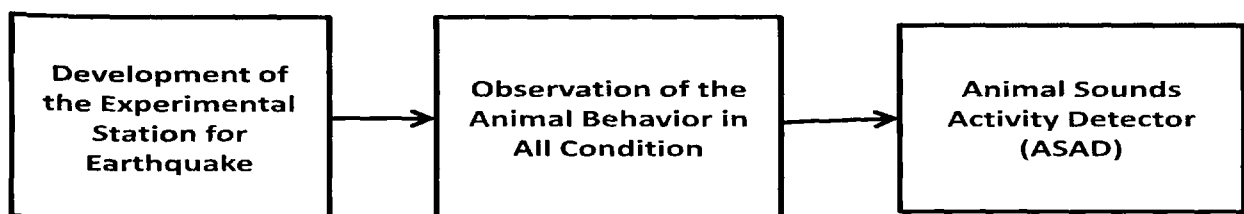


Figure 17.1: Development of the earthquake simulation experiment