

# RABAB FOR WARNING DISSEMINATION



## Introduction

The idea to develop RABAB as a local tsunami early warning system was based on the experiences of the Earthquake Events in Padang West Sumatra. The government and the DM stakeholders have learned that right after a big Earthquake event, mostly people got stunned and shocked. They need information, guidance or order what to do next. How big was the Earthquake? Is it Potential Tsunami or not? Shall they evacuate or just alert and stay at home? These guidance and order (audio/vocal format) must come from a trusted person / institution at the earliest possible after the EQ events. RAPI (Radio Antar Penduduk Indonesia) Sumatera Barat, had an idea to create a local warning dissemination system called RABAB, try to answer those questions. RABAB actually is a radio based local EWS. This system allows the mandated person / institution to give and spread the instructions, order or information at anytime and anywhere in the city. Why it's called RABAB? Name of Rabab is taken from the name of a traditional west sumatra musical instrument which is normally used by the artist to tell stories.

## How Does It Work?

The community leaders (Walikota, Bupati, Chief of Army and Police), each one can be equipped with a special programmed Handheld Transceiver. Whenever EQ happens and dissemination information/tsunami warning is needed, the local leaders will have a priority chance to give their guidance directly or even an evacuation order by just using the Handheld Transceiver. The voice signal will be re-transmitted via a main repeater unit placed on the high ground to the normal FM Radio on special frequency.

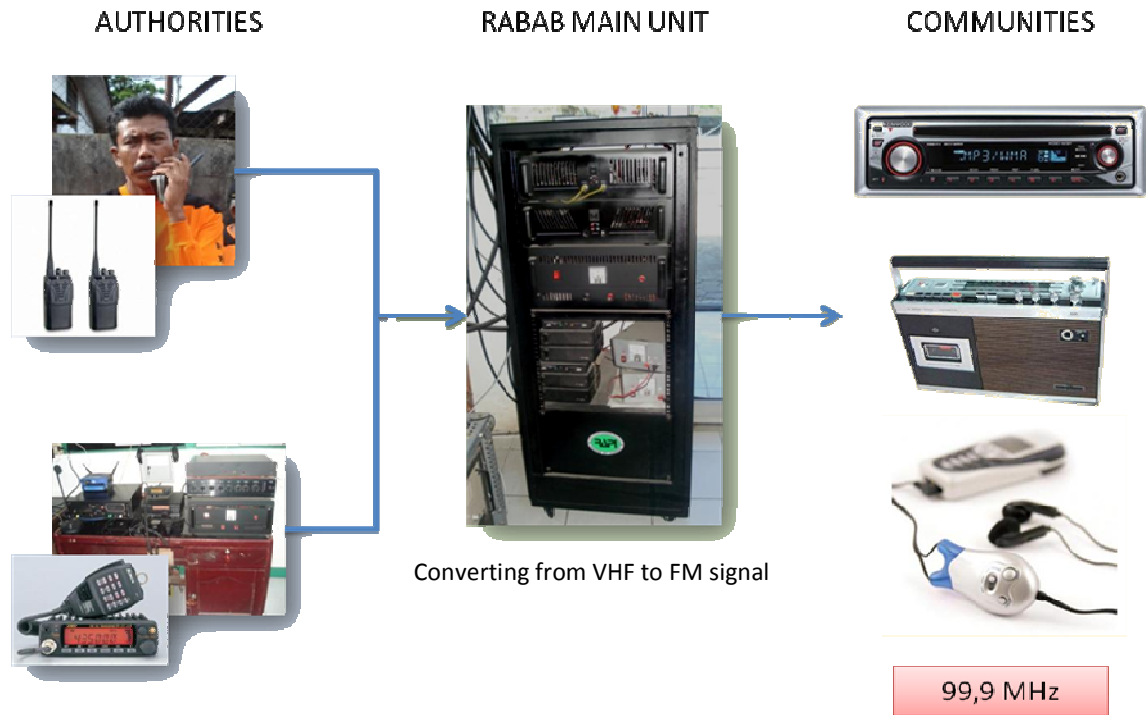
## Purposes in context of Tsunami Early Warning System

As already mentioned in the introduction that right after a Big EQ event, people need guidance and direction from their leaders / mandated institution. RABAB is made to support and to speed up the warning / info dissemination from local leaders to the public.

In most of cases, Tsunami happens after a big EQ event. In many cases it will damage the infrastructures of communication (electricity, telephone line, etc). Rabab Works 24 x 7 using continuous backup system.

The Local leaders can immediately give their commands/instruction to the community and they don't have to wait. In case of Tsunami threat there is not much time to react. Speed plays very important role to disseminate information or warning to the people. This information must be received clearly and with the most common and familiar mode (normal FM Radio and public facilities loudspeakers).

### Working Mechanism Diagram



### Flowchart of RABAB System

#### Operation and Maintenance

Rabab System consists of Trigger Unit, Main Unit and Slave Unit. The trigger unit is a **programmed** Handheld / Base VHF Radio which is set on special frequency. There is a hidden password system installed at the main unit to avoid any misuse of the system by unauthorized people. Only a programmed radio unit (password installed) can access the system.

#### Trigger Unit

In refer to the Satlak Organization Structure, the Trigger Unit only limited to the Mayor / Bupati as the Chief in Command (CIC) during disaster, Dandim (Military Chief) as the first CIC and Kapolres/Kapoltabes as the second CIC. Another trigger unit should be placed on Warning Center (Pusdalops). The trigger unit at Pusdalops is a VHF radio base transceiver equipped with some more additional equipment to extend its capabilities like producing pre-recorded digital voice and digital alarms in many forms. Maintenance for the trigger unit is just to check the battery and make sure that its not empty. Just recharge the unit every night.

### **Main Unit**

The Main Unit must be located at the high, safe area (ex.top of the hill) and have a line of electricity supply (PLN) to ensure that the repeater radios inside the main unit will work and function properly. This unit is designed with almost free maintenance. On the spot maintenance (light check) can be scheduled once a month. The backup dry battery should be replaced once a year. During normal situation the unit uses a power from PLN. The backup battery will automatically work when there is no supply from PLN detected. A general check for all equipment (antennas, cable, mounting, etc) can be scheduled twice a year.

### **Slave Unit**

This unit receives the voice message from repeater at main unit and then amplifies it to the Loudspeakers. The unit consists of an FM Radio receiver, an amplifier, a loudspeaker, a battery backup and battery charger. The slave unit can be placed at strategic places like markets, schools, hospitals, malls, etc. It can be also connected to the mosque loudspeaker sound system. Same as the other units, the slave units needs not much attention for maintenance. The most important one is to take care the battery backup system.

### **Cost of Implementation**

The estimation cost to implement a set of Rabab System is around Rp. 90.000.000,-.

This price includes complete set of: trigger units, main unit and 3 slave/receiver unit, towers, installation, antenna, cables, automatic backup power system, battery power backup, battery charger, loudspeakers, amplifiers.

(Estimates of development cost is vary due to the availability of electronic components, technical equipment and geographical condition)

### **Technical Information**

1. Handheld Transmitter .....	VHF Radio
2. Operating Frequency Trigger Unit Ouput .....	VHF (160..Mhz)
3. Security Mode.....	TSQL, etc.
4. Operating Frequency Main Unit Output ( can be adjusted).....	99.9 Mhz
5. Antenna Impedance .....	50 Ohm
6. Coaxial Cable Type .....	RG 8
7. Output Power Main Unit .....	50 watt
8. Trigger Unit Receiver Antenna Type .....	Omni Dir.
9. Main Unit Transmitter Antenna Type – 1 Bay (can be extended) .....	Omni Dir.

**Important Contact Addresses:**

The RABAB System is developed and implemented for the first time in Padang City, West Sumatra, Indonesia by RAPI (Radio Antar Penduduk Indonesia) supported by GTZ IS – GITEWS. It is dedicated to support the development of Local Tsunami Early Warning System. For further detailed information please contact the following contacts:

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