How to rescue people in your country from earthquake damages? -I will show you a possible solution-

Challenge Co., Ltd
KAZUO SASAKI
Founder and President
18 March 2019

CHALLENGE

JBP Japan Bosai Platform
Bosai ▸ Holistic approach to reduce disaster impacts

Introduction of company

◆Company Name : Challenge Co., Ltd.

◆Company Representative : Kazuo Sasaki

◆Date of Establishment : April 24, 2009

◆Capital : 15 million yen

◆Area of Business : Maker of disaster-/security-related products as well as systems

◆Products and Services :

Earthquake
Sensor Alarm Equipment
EQ Guard

School Guard and
Hospital Guard for ensuring security of schools, hospitals and shopping malls

Data center

EQ guard

School guard

◆Headquarters : 2-14-4, Kojima, Taito-ku, Tokyo, JAPAN, 111-0056

TEL 81-3-5809-2304 FAX 81-3-5809-2305

http://www.challengego.co.jp

Earthquake Sensor Alarm System (ESAS)

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◆When Earthquake occurs, people needs to evacuate immediately.

◆Nuclear plants, chemical plants and trains must be shut down.

5seconds extra warning can be the difference between life and death

80% of deaths could be prevented by early and accurate alarms.

Specifications

Item	EQGuard III	Transmit method	TIPv4, 100BASE-TX
Display	PC display	Operational switches	Test switchx2, Reset switch,Setting-clearing switch
Noise level	0.1 gal	Power	DC5V
ETA	PC display at -99 to 999sec per sec display	Exterior(mm)	188.7x160x50.5
Warning display	LED flash display	Weight(g)	Approx.1k g
Audio/Video output	Line output, Headphone output, Volume adjust	Environment	Temp.:-10degC～+50degC,no fogging
Warning output	Loop output 6circuits	Facilities	Indoors,Power adapter

EQ guard has sensor inside

➢It detects initial small vibration (P wave) and issue alarm immediately before big shaking (S wave) arrives. So, people can evacuate before strong shaking starts.

➢Real-time display of the seismic intensity of each observation point on the map

➢ Control signals of EQ guard can be issued to shut down chemical plants, nuclear facilities etc. beforehand.

➢Customers Japan:1000

Indonesia, Korea, Turkey, Romania, PNG

The benefit of this system for DRR

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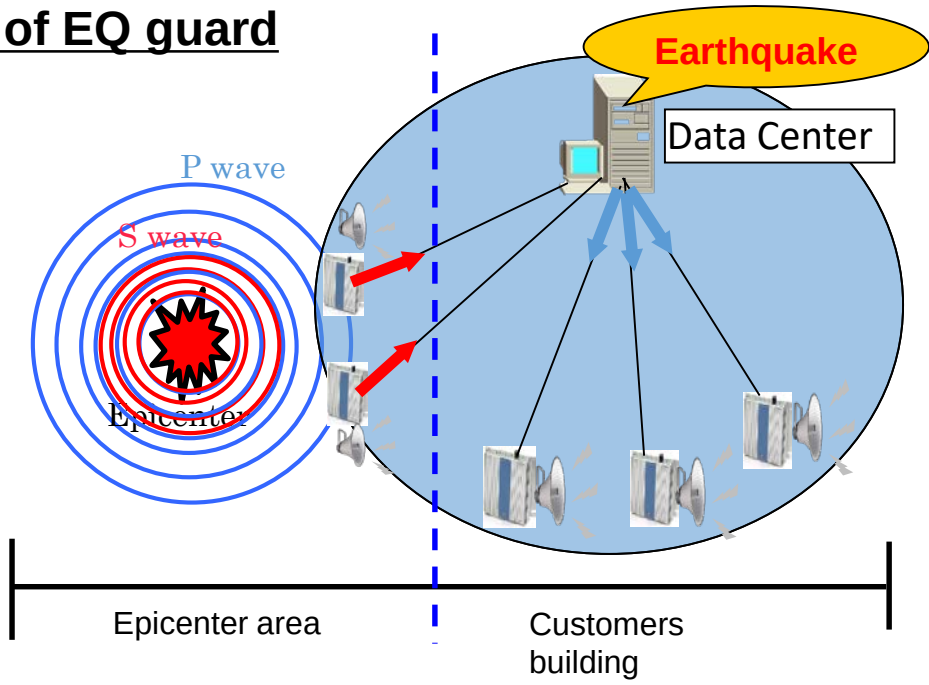
◆Early warning system based on network of EQ guard

1.EQ guard can work as a stand alone, and also can work as a local network with several installations.

2.It is possible to construct a regional earthquake alarm system by making NW of EQ guard.

3. This system works without nation-wide dense seismometer network



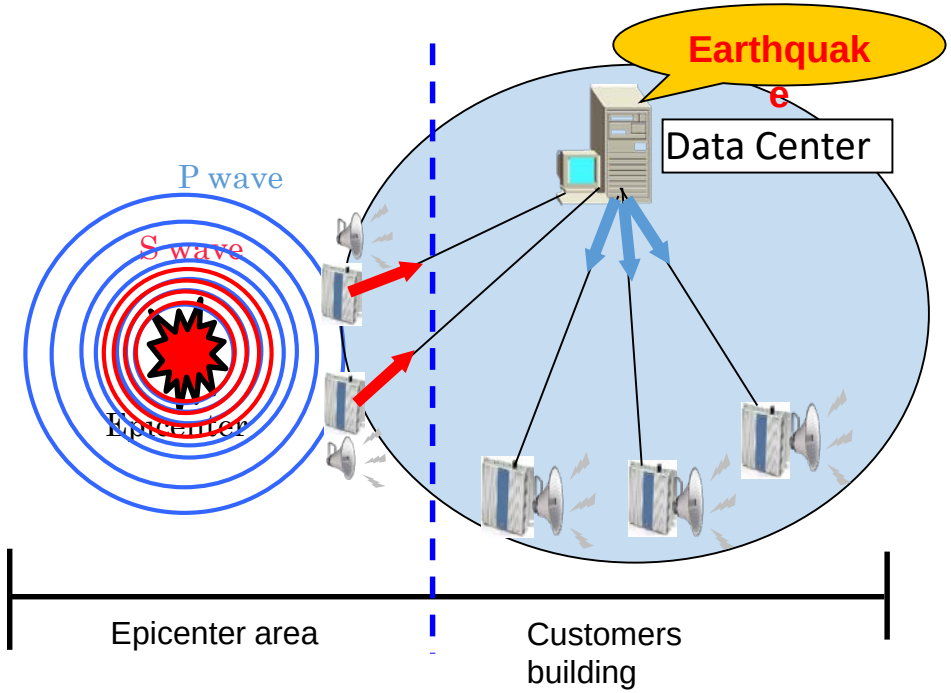
◆ Contribution to global targets

- Reduce fatalities and injured people by the Earthquake Sensor Alarm System (ESAS)
- Increase introduction countries and target people by establishing ESAS in each country

◆ Contribution to SDGs

- Rectify inequality, and ensure the safety of all people by Introduction of ESAS.
- Establish resilient infrastructure by ESAS4

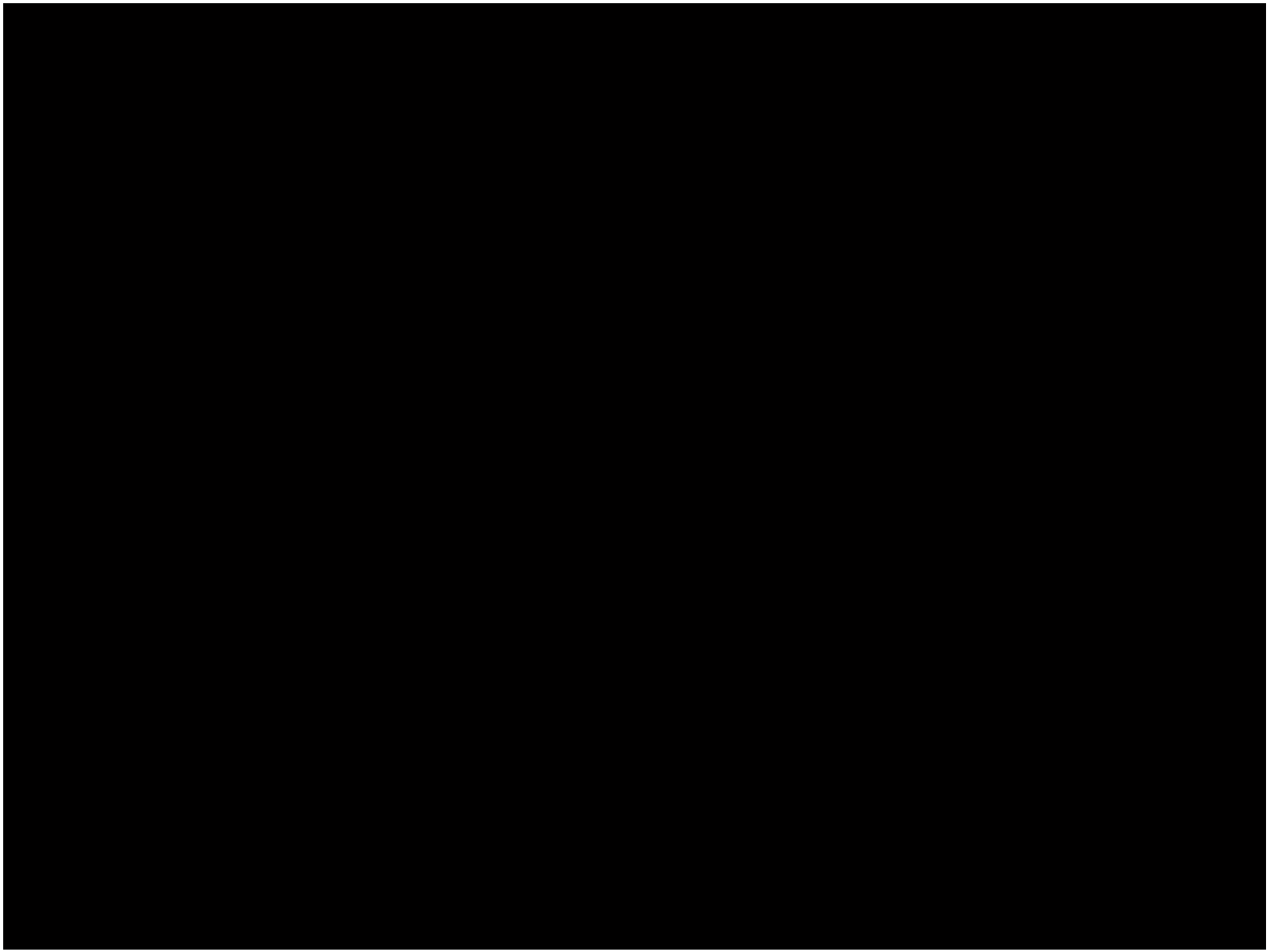
The benefit of EQ guard



evacuation

Students can evacuate safely, if trained.
Evacuation drill is very important.

The Drill video of EQ guard



The targeted customers

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- Government and Local Government
- School, Company, Factory, Hotel and Apartment
- Construction Company, Maintenance Company and Insurance Company

Examples of customers

1,000 sets installed.

Japan:

YAMAHA

TOTO

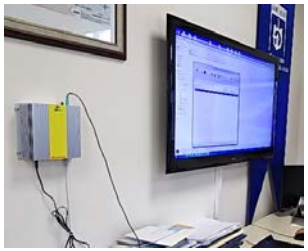
Nidec 日本電産株式会社 -All for dreams

ROHM SEMICONDUCTOR

立命館大学



Japan


Turkey

Schools, kindergarten, nursery,

Nursing home etc

Indonesia: Yogyakarta, Aceh

Korea: Soul

Turkey ,Romania, PNG

Patent : Acquired (No.5373435)
Launch : 2012


Romania

PNG

Business Model

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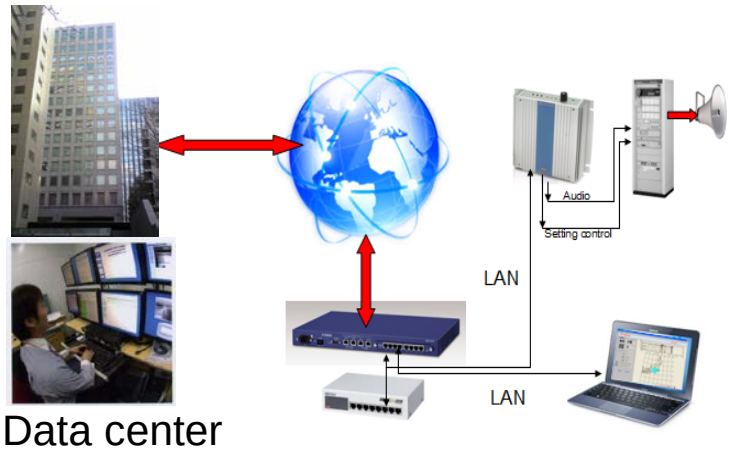
1.System configuration and Cost



Data center

Initial cost

- Device (Sensor) 3000US$

Running cost

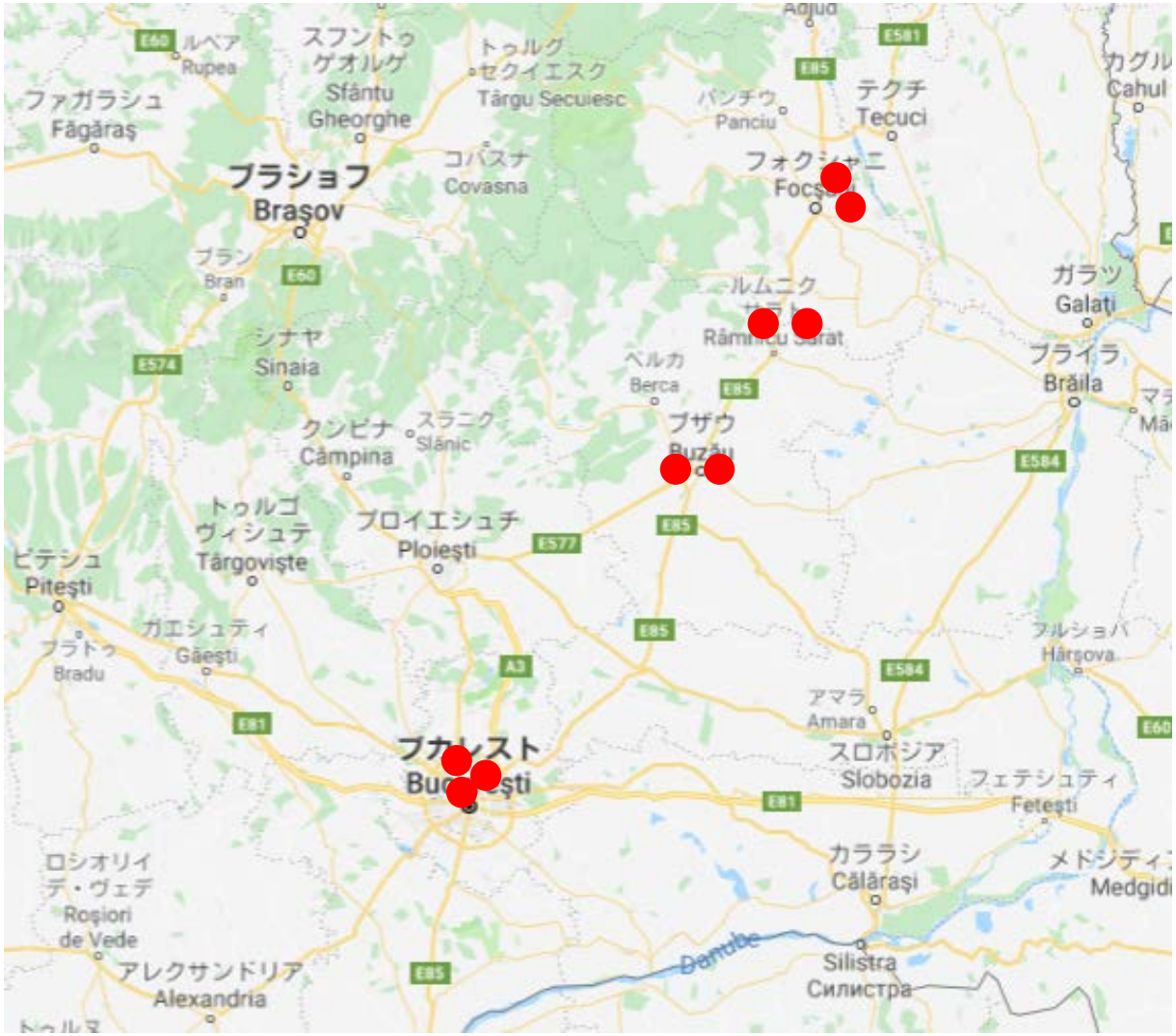
- Data center Service 50US$/month

2.System operation

- EQ guard send observation data to data center when earthquake occur.
- Data center collect data and send signal to EQ guard
- EQ guard issues Alarm

The distribution server of the data center and each EQ guard are constantly communicating and monitoring the state.

EQ guard in Romania



Evacuation Drill in Romania (Bucharest school)

1. **advance preparation**

Date:12/11/2018 PM:15:00~

Date:13/11/2018 AM:9:00~9:30

School: Colegiul Economic Virgil Madgearu

News of Local media

https://adevarul.ro/news/societate/Scoli-dotate-echipament-anunta-cutremurul-20-secunde-produca-efecte-1_5c6c17dc445219c57e56ccf4/index.html

https://www.ziaruldevrancea.ro/special/educatie/simulare-si-exercitiu-de-amploare-in-caz-de-cutremur-cu-participarea-japonezilor-la-cn-pedagogic-spiru-haret-focsani

https://monitoruldevrancea.ro/2019/02/21/video-si-galerie-foto-japonezi-la-colegiul-pedagogic-din-focsani-pentru-un-exercitiu-in-caz-de-cutremur/

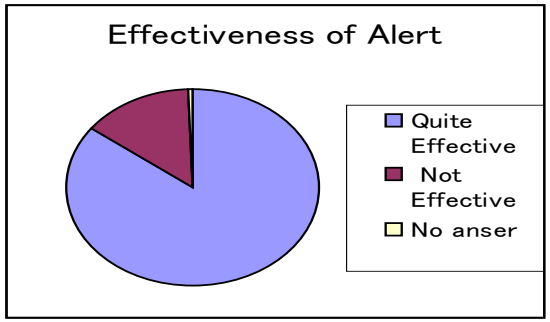
Evacuation Drill_Romania

Questionnaire of Evacuation Drill_Bucharest

2.Impression of Drill

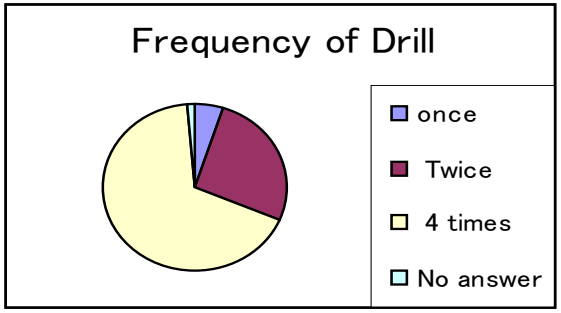
1.Effectiveness of Alert

Quite Effective	Not Effective	No answer
253	42	2



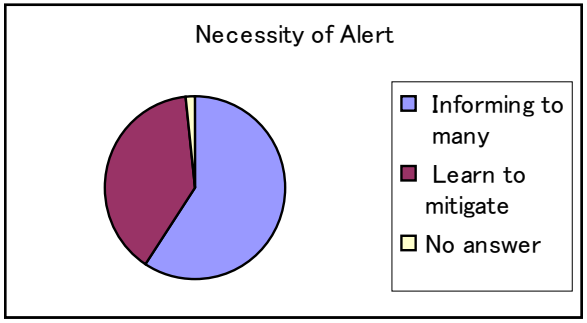
2.Frequency of Drill

once	Twice	4 times	No answer
15	78	198	4



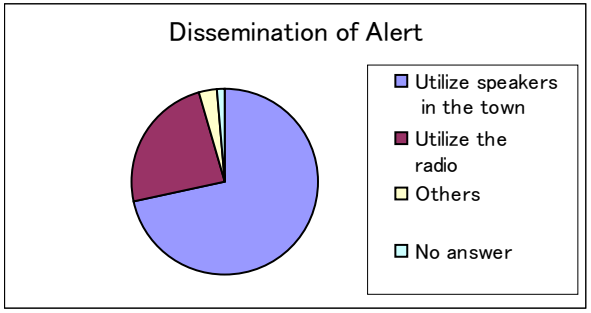
3.Necessity of Alert

Informing to many	Learn to mitigate	No answer
177	117	5



4.Dissemination of Alert

Utilize speakers in the town	Utilize the radio	Others	No answer
215	72	9	4



M 5.5 - 16km SE of Comandau, Romania

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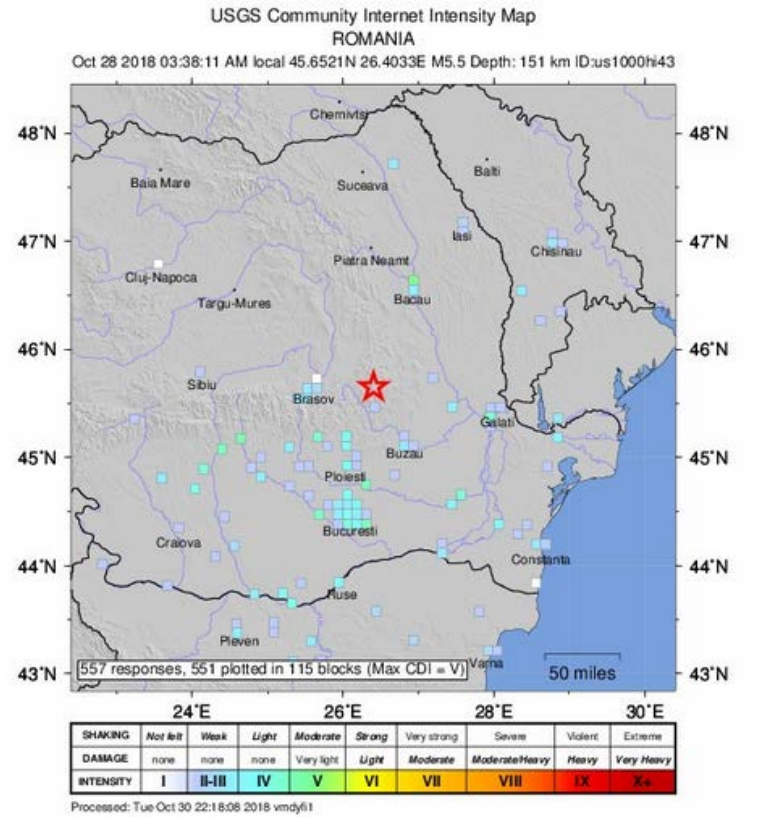


Epicenter information

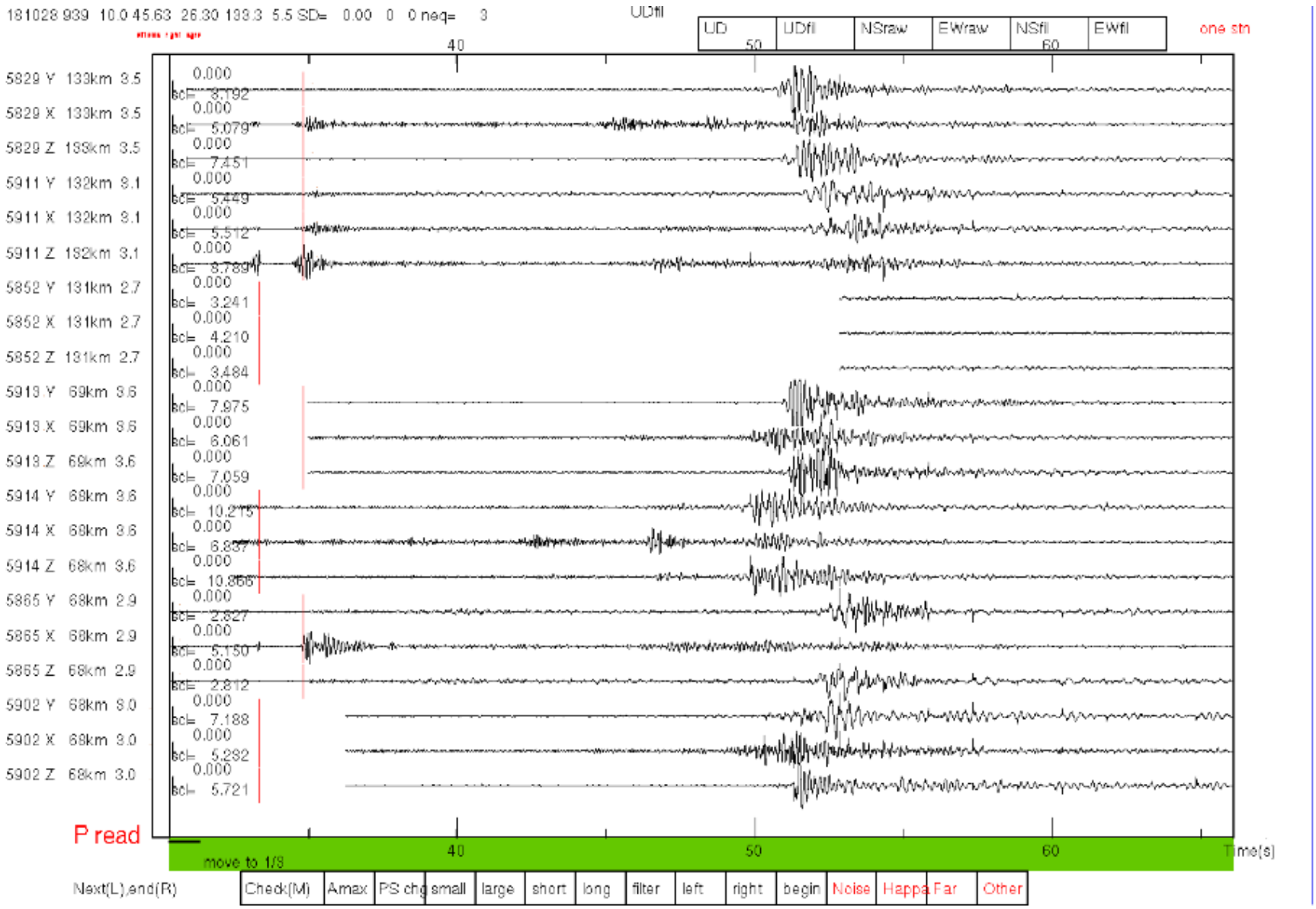
M 5.5 - 16km SE of Comandau, Romania

2018-10-28 00:38:11 (UTC)　9:38:11(JAPAN)

45.652°　N 26.403°　E

151.0 km depth

Waveform of sensor_EQguard



Date	H	Min	Org.(sec)	Latitude	Longitude	Depth(km)	Intensity	Mag
2018 10 28	9	38	10.9	45.652	26.345	167.0		6.2

STN	Dis(km)	dep	Obs	Est
MHH0005829	67.81	167.00	3.52	3.13
MHH0005865	65.06	167.00	2.89	3.13
MHH0005911	65.53	167.00	3.06	3.13
MHH0005913	134.08	167.00	3.57	2.88
MHH0005914	67.93	167.00	3.57	3.13

Hypocenter parameters by USGS

20181028 938 10.0 45.63 26.30 151.30 5.50

Computed hypocenter location and list of estimated shaking intensity of JMA definition.

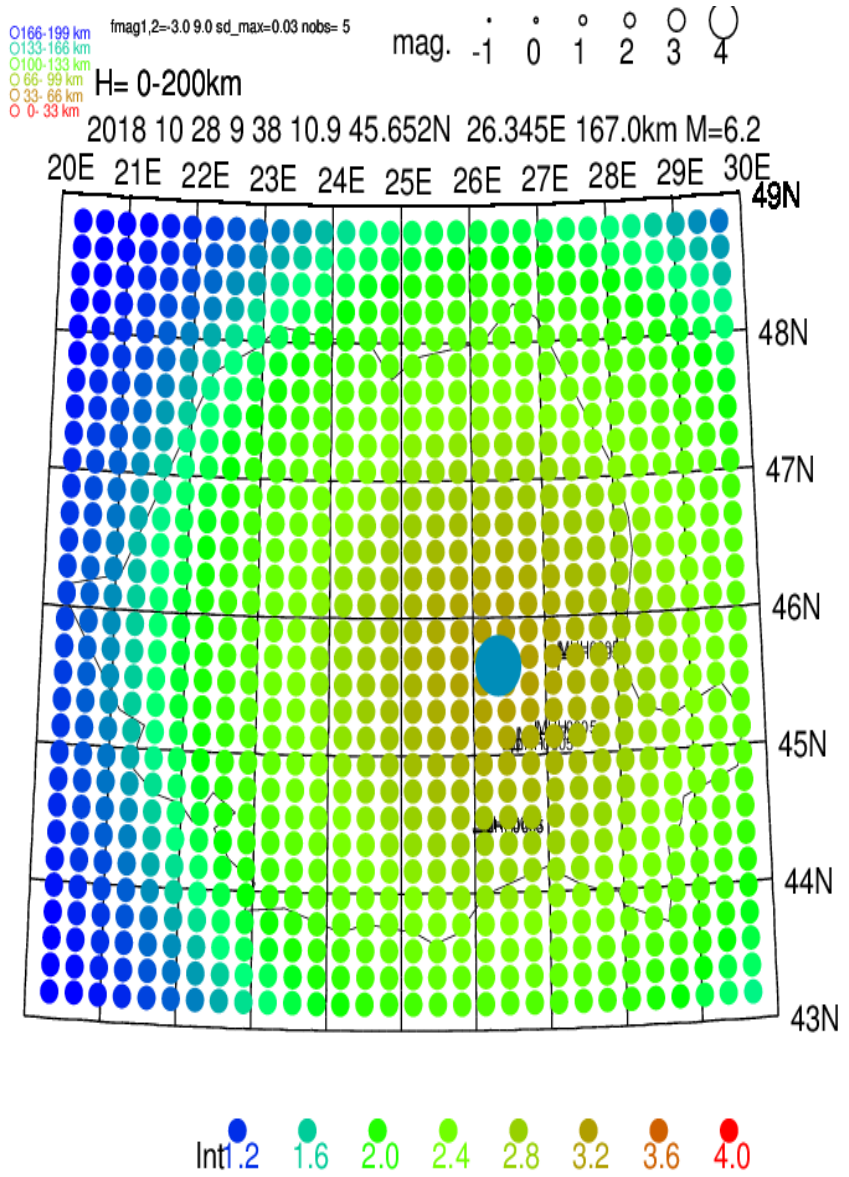
Obs: Observed JMA intensity,

Est: Estimated intensity from hypocenter location and intensity magnitude.

Hypocenter and magnitude are calculated by the use of P wave arrival times and shaking intensity measured within 4 sec from P wave arrival, which are stored on the disk of data center of Challenge Cor. And are sent from stations of EQ-GARD III.

There are difference in the definition between Shaking intensity magnitude Richter magnitude.

Intensity map



Distribution of estimated shaking intensity calculated from the P wave arrival times and shaking intensities data, which are stored on the hard disk of the data center of Challenge Co ,.Ltd , and are send from stations of EQ GARD III.

Collaboration with UNESCO and UNDP

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UNESCO International Platform on Earthquake Early Warning Systems (IP-EEWS)

Earth Sciences and Geo-Hazards Risk Reduction, UNESCO, Paris, France

Contact us: Iair Torres (i.torres@unesco.org) and Margherita Fanchiotti (m.fanchiotti@unesco.org)

1. INTRODUCTION

Many countries around the world are threatened by natural hazards, such as tsunamis, floods, volcanic eruptions and earthquakes (1). In recent decades, considerable progress has been made in the development of early warning systems (EWSs), to prevent loss of life and economic damages by disseminating timely information about potentially catastrophic hazards to the public and emergency managers. However, significant challenges remain in advancing the development of EWSs for specific hazards, particularly for sudden-onset hazards such as earthquakes (2). Earthquake early warning systems (EEWSs) can detect an ongoing earthquake and provide enough time to take emergency measures, as well as inform about the expected severity of damages for a given area in real time (3,4). Since EEWSs have been developed only in selected countries so far (see map below), there is a need for cross-border collaboration and a knowledge exchange platform under international coordination, in order to support countries located in seismically active regions and vulnerable to earthquake hazards (2,5).

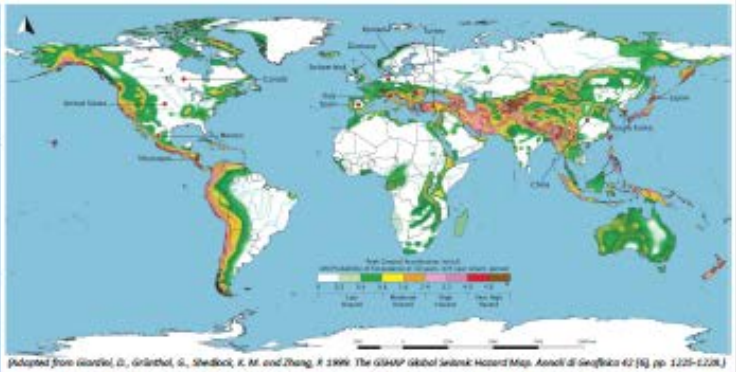
2. IP-EEWS

In an effort to address these gaps, in December 2015 UNESCO launched the International Platform on Earthquake Early Warning Systems (IP-EEWS).

10 Countries committed to UNESCO IP-EEWS

Objectives

- To provide an international platform for knowledge sharing.
- To strengthen cooperation.
- To assess current capacities and gaps.
- To build scientific and technical capacities.
- To support the development of new EEWSs worldwide, notably in developing countries.
- To promote and strengthen the development of EEWSs.
- To find synergies between EEWSs and multi-hazard early warning systems.
- To develop a framework for coordinating observation systems and sharing seismic data.
- To inform policy makers through guidelines and recommendations.
- To build bridges between science, practice and policy.
- To promote public awareness activities.



(adapted from Giardini, D., Grünthal, G., Shedlock, K. M. and Zhang, P. 1999. The GSHAP Global Seismic Hazard Map. Annali di Geofisica 42 (6), pp. 1225-1228.)

UNESCO's International Conference on Earthquake Early Warning Systems: From Science to Policy

11-13 October 2017 at UNESCO's headquarters in Paris, France

3. ACTIVITIES

- Map EEWS state of the art in science and policy.
- Promote regular scientific and policy exchanges through conferences, meetings, workshops, etc.
- Engage new countries in the development and implementation of EEWSs.
- Collect and disseminate best practices.
- Identify existing gaps in capacities (technical and human) and regulations.

4. EXPECTED RESULTS

- A roadmap for advancing EEWSs, from science to policy, worldwide.
- Recommendations resulting from regular meetings among IP-EEWS member countries.
- A compendium of existing best practices, opportunities and challenges related to EEWSs and contributing to reaching global target "g" of the Sendai Framework for Disaster Risk Reduction 2015-2030 (6).
- Engagement of new countries in IP-EEWS.

5. CONCLUSIONS

Natural hazards cause many fatalities and significant economic losses every year worldwide. Exposure and vulnerability to these hazards is increasing due to climate change, overpopulation and rising urbanisation (1). In light of this, disaster risk reduction has emerged as a global challenge, and the need to "substantially increase the availability of, and access to, multi-hazard early warning systems and disaster risk information and assessments to the people by 2030" has become a global target (target "g"), as highlighted in the Sendai Framework for Disaster Risk Reduction 2015-2030 (6). As the only United Nations agency with a mandate in Earth Sciences, UNESCO has been very active in promoting international cooperation, scientific knowledge exchange and capacity building for the development and operationalisation of geo-hazard EWSs, including EEWSs, worldwide. IP-EEWS member countries and UNESCO strongly believe in the development and implementation of EEWSs and the benefits from IP-EEWS, which builds on the extensive network and scientific reputation that UNESCO has gained in helping nations foster earthquake resilience.

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(1) UNISDR. 2015. Global Assessment Report on Disaster Risk Reduction 2015. Geneva, Switzerland: UNISDR.

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(3) Clinton, J., Zollo, A., Marmureanu, A., Zulfikar, C., and Parolai, S. 2016. State-of-the art and future of earthquake early warning in the European region. Bulletin of Earthquake Engineering 14(9), pp. 2441-2458.

(4) Allen, R.M. 2013. Seconds count. Nature 502, pp. 29-31.

(5) Luther, J., Hainsworth, A., Tang, X., Torres, I. and Fanchiotti, M. 2017. Concerted International Efforts for Advancing Multi-Hazard Early Warning Systems. In: Advancing Culture of Living with Landslides. Springer, vol. 1.

(6) UNISDR. 2015. Sendai Framework for Disaster Risk Reduction 2015-2030. Geneva, Switzerland: UNISDR.

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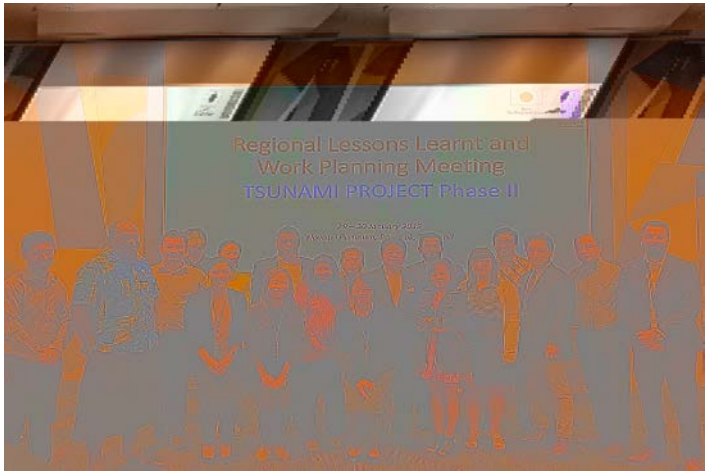
Presentation ceremony of EQ guard at JBP meeting

21 January 2019 (Tokyo)



Meeting of Regional office of UNDP

29 January 2019 (Bangkok)

To the World

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Thank you!

URL: http://www.challengego.co.jp