



Handbook for the Utilization of DMAM

(Disaster Management Audio Materials)
for Community Based Disaster Management

March 2010



JICA Hyogo/Disaster Reduction Learning Center (DRLC)

jointly with

AMARC Japan Working Group

Combine Resource Institution



| |
|--------|
| HIC |
| JR |
| 10-002 |

Handbook for the Utilization of DMAM

**(Disaster Management Audio Materials)
for Community Based Disaster Management**

March 2010

**JICA Hyogo/Disaster Reduction Learning Center (DRLC)
jointly with
AMARC Japan Working Group
Combine Resource Institution**

Acknowledgements

Since established jointly by the Japan International Corporation Agency (JICA) and the Hyogo Prefectural Government in April 2007, JICA Hyogo/Disaster Reduction Learning Center (DRLC) has been conducting various activities to promote human resources development in the field of disaster reduction.

One of its major activities is to develop DRLC's original teaching materials to conduct training course in the field of disaster reduction.

As it is widely recognized, access to correct information on time in proper manner plays the key role in disaster reduction management.

The lessons of the Hanshin-Awaji Earthquake taught us that even in the recovery process after the disaster, correct information may contribute to improve transparency, fairness of recovery operations and encourage all the players to participate in the joint work of recovery.

DMAM, which stands for Disaster Management Audio Material is one of the concrete fruit of collaboration among DRLC and the World Association of Community Radio Broadcasters (AMARC) Japan Working Group and many other supporting organizations.

This handbook is enriched by the lessons learnt from the Hanshin-Awaji Earthquake, and furthermore developed through the pilot project which were conducted in at Yogyakarta, Indonesia in 2009.

Having witnessed large-scale earthquakes recently across the world including Haiti and Chile, I sincerely hope this innovative handbook will be widely used in many developing countries to promote disaster reduction.

Last but not the least, I wish to extend my deepest gratitude once again for valuable contribution and cooperation rendered by AMARC Asia Pacific, Radio FM YY, Multilanguage Center FACIL, SEEDS Asia, and UNCRD Disaster Management Planning Hyogo Office.

March, 2010

IREI Eizen

Director General, Disaster Reduction Learning Center
(Director General, JICA Hyogo)

Preface

This Handbook for the Utilization of DMAM (Disaster Management Audio Materials) was developed as a practical guide for the use of 'Disaster Management Audio Management Materials for Community Radio Broadcasting' in training human resources in the field of disaster management.

However, this handbook is not strictly defined for the use of DMAM, rather it introduces a method of how anyone in the community can become familiar with and experience DMAM and, after absorbing it, will be able to adapt it to the environment of their own community to improve community based disaster management.

DMAM is a disaster management audio materials and text message set in 9 languages, recorded on a single CD-ROM in a disaster-type format in categories to suit various disaster situations. This material was jointly developed by JICA Hyogo/Disaster Reduction Learning Center (DRLC) and the World Association of Community Radio Broadcasters (AMARC) Japan Working Group to be used by audio media - especially community radio stations in developing countries - to easily and quickly provide accurate information when natural disasters occur. The main aim of DMAM is to increase the disaster management ability of ordinary people who are the weakest victims when a disaster occurs, as well as their collective community. The most important goal is, that through the use of this handbook, 'self-help' among residents and the community in dealing with natural disasters will progress, and through general cooperation and a display of 'cooperative-help,' damage caused to the community by disasters will be reduced, even if by a little.

There are high expectations being placed on community radio stations as a support tool for relief and recovery activities in the Asian-Pacific region, where there are many natural disasters such as earthquakes and tsunami. Beginning with the Hanshin-Awaji Earthquake in 1995, the Sumatra Earthquake and Tsunami in December 2004 and the Java Earthquake in 2006, the enormous role community radio stations played in emergency relief for the weaker communities gained attention. We believe that DMAM will act as a useful tool for community radio stations in their role of promoting disaster management information in communities, and with some creativity and planning it can be used as a new basis to promote disaster management activities to meet various situations and experiences of each region or community.

While creating this handbook, we held a pioneer workshop on how to use DMAM in the region of the beautiful old capital of Indonesia, Yogyakarta (Jogjakarta) located in central Java. After evaluating the results, adjustments were made for more effective ways for its utilization.

Indonesia is a country that experiences many natural disasters, many having occurred in recent years. Not only was Yogyakarta badly damaged when the central Java earthquake occurred in May 2006, but it is located in the region of Mt. Merapi which is said to be the most active volcano in the world. Faced with dangers of such natural disasters, community radio stations are actively promoting disaster management activities in the region.

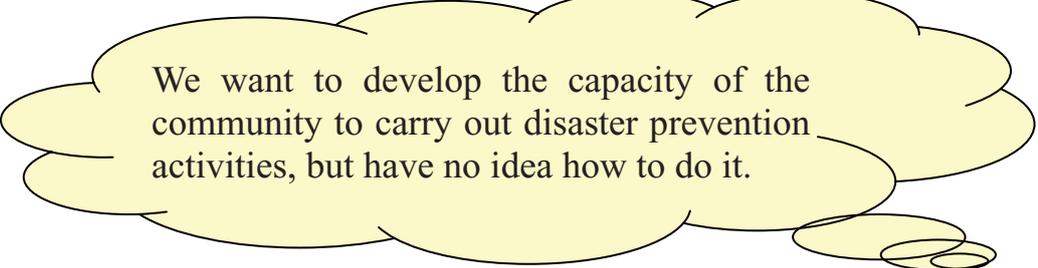
We received the full support of the Combine Resource Institution (CRI) throughout this pioneer workshop which was co-hosted by three organizations: DRLC, AMARC Japan Working Group and CRI. CRI supports grass-root level information networking in socially weaker communities in Indonesia. DMAM was developed with the cooperation of CRI, which proved to be an invaluable partner throughout the project.

DMAM was developed through the experiences and knowledge of those who experienced natural disasters and related organizations. It is our wish that this handbook will provide useful hints on how to use DMAM, and in doing so improve the natural disaster management skills of communities which are worst hit by disasters, and reduce, even by a little, the number of victims and damage caused by natural disasters.

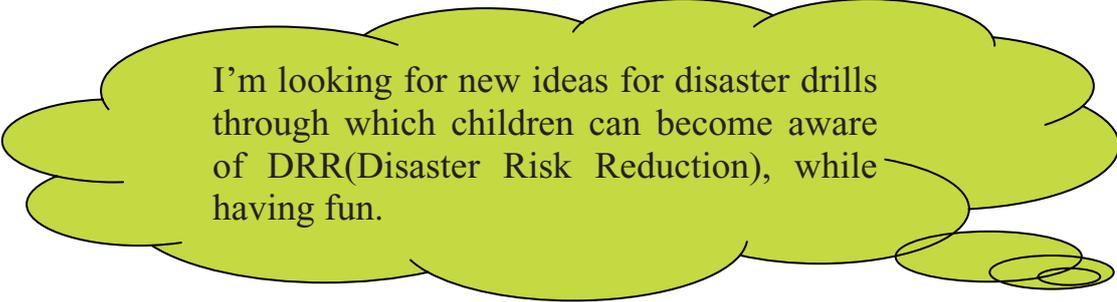
March, 2010
JICA Hyogo/Disaster Reduction Learning Center

You can make a difference !

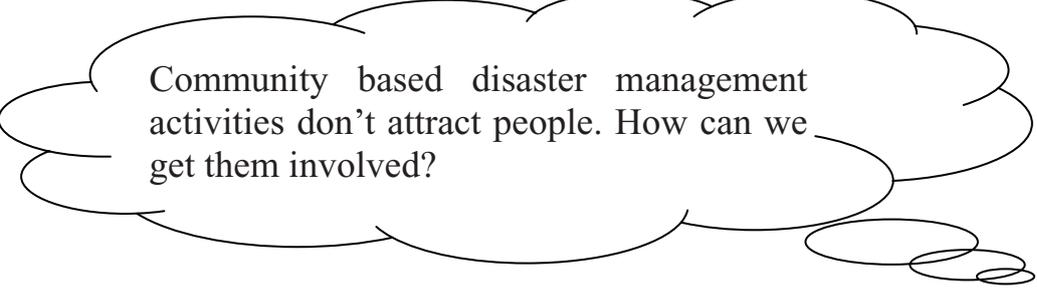
This handbook is useful for community members including community radio activists who are interested in issues concerning disaster management such as...



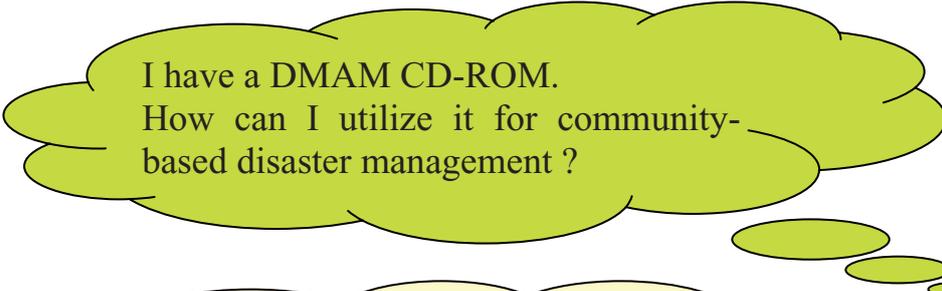
We want to develop the capacity of the community to carry out disaster prevention activities, but have no idea how to do it.



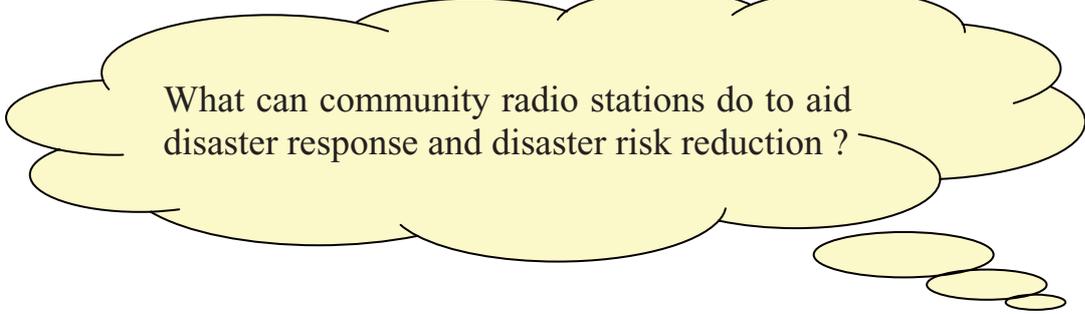
I'm looking for new ideas for disaster drills through which children can become aware of DRR(Disaster Risk Reduction), while having fun.



Community based disaster management activities don't attract people. How can we get them involved?



I have a DMAM CD-ROM.
How can I utilize it for community-based disaster management ?



What can community radio stations do to aid disaster response and disaster risk reduction ?

You can read and implement parts of this manual which you find important depending on your situation.

Table of Contents

Acknowledgements

Preface

You can make a difference !

| | |
|--|-----------|
| Chapter 1. What is Community Based Disaster Management? | 1 |
| Basic Concept of Community Based Disaster Management | 2 |
| Community Based Disaster Management in Indonesia | 4 |
| Chapter 2. How to Promote Community Based Disaster Management | 7 |
| How can we promote participation in disaster management ? | 8 |
| Let's think about "Our Community" (<i>Step1</i>) | 9 |
| Let's think about "Our Disaster Management" (<i>Step2</i>) | 14 |
| Let's think about "Our Community Based Disaster Management" (<i>Step3</i>) | 17 |
| About Self-help / Cooperative help / Governmental help (<i>Commentary</i>) | 18 |
| Column: Kobe's Community-Based Disaster Prevention Organization "BOKOMI" | 19 |
| Indonesia Workshop Notes | 22 |
| Column: The Roles of Community Radio in Disaster Management | 27 |
| Chapter 3. What is DMAM (Disaster Management Audio Materials) for Community Radio Broadcasting? | 29 |
| Chapter 4. How to Utilize DMAM for Community Based Disaster Management ~Let's learn from the experience of Indonesia~ | 37 |
| Column: Community Workshop on Utilization of DMAM Inspires the Community | 52 |
| Chapter 5. About Natural Disasters | 55 |
| Chapter 6. The Role of Community Radio in Disaster Management Efforts (Case Studies) | 65 |
| Sources of Information | 76 |
| Profiles of Organizations | 77 |

Chapter 1

What is Community Based Disaster Management?

Basic Concept of Community Based Disaster Management

On 17 January 1995, The Great Hanshin-Awaji Earthquake, a major sub-urban earthquake, struck the southern part of Hyogo Prefecture, with damage focused on Kobe City. The earthquake caused the loss of 6,402 lives and injury to 40,000 people, as well as approximately 10 trillion yen in economic damage.

Right after the quake, many people buried under buildings and debris were rescued by their relatives and neighbors. Some researchers estimated that nearly 80% of victims were rescued in this way. These local-level lifesaving activities played a very significant role in highlighting the importance of community-based disaster response.

Rather than community-based response to disaster being sudden or impulsive, it is important for communities to be prepared for such a response before disasters strike. In other words, community based disaster management planning (**Community Based Disaster Management: CBDM**) is important.

Here, we introduce the Sustainable Community Based Disaster Management research project set out by the United Nations Center for Regional Development (UNCRD), Disaster Management Planning Hyogo Office.

It is common knowledge that people at the community level have more to lose because they are the ones directly hit by disasters, whether major or minor. They are the first ones to become vulnerable to the effects of such hazardous events. The community, therefore, has a lot to lose if they do not address their own vulnerabilities. On the other hand, they have the most to gain if they can reduce the impact of disasters on their community. The concept of putting the communities at the forefront gave rise to the idea of community-based disaster management. At the heart of CBDM is the principle of participation. Through CBDM, the people's capacity to respond to emergencies is increased by providing them with more access and control over resources and basic social services. Using a community-based approach to managing disasters certainly has its advantages.

Although indigenous coping mechanisms have existed for as long as human history, the term CBDM was first used more popularly in the middle of 1990s in the Asian region following the realization that:

- The local population in a disaster-prone area, due to exposure and proximity, are potential victims and assume most of the responsibilities in coping with the effects of disasters
- The local population has local knowledge of vulnerabilities and are repositories of any traditional coping mechanisms suited for their own environment.
- The local population responds first in times of crisis and are the last remaining participants as stricken communities strive to rebuild after a disaster.

The CBDM approach provides opportunities for the local community to evaluate their own situation based on their own initial experiences. Under this approach, the local community not only becomes part of creating plans and decisions, but also becomes a major player in its implementation.

Although the community is giving greater roles in the decision-making and implementation processes, CBDM does not ignore the importance of scientific and objective risk assessment and planning. The CBDM approach acknowledges that as many stakeholders as needed should be involved in the process, with the end goal of achieving capacities and transferring resources to the community, which would assume the biggest responsibility in disaster reduction.

It should be noted that in an environment where the economy is worsening and resources are growing more scarce, CBDM would thrive as it promotes local, affordable and incremental solutions. It should, however, be emphasized that local solutions should not be left alone and resource agencies, including the government should not take CBDM as a substitute for not taking action.



It should also be noted that many community members will have different perceptions of the nature of disaster risk. In particular, residents who have not experienced a major earthquake before in their area would not know the effects of such an occurrence. The eruption of Mt. Pinatubo is an excellent example. Although it is classified as active by the country's volcanologists, its previous eruption was over 600 years before the 1991 event. Thus, residents and authorities around the volcano did not perceive the magnitude of these devastating effects. Similarly, due to climate change and variability, residents and local authorities may not be aware of projected worsening hazardous conditions, intensity and frequency of extreme climatic events. Experience shows that a CBDM program could address these limitations by ensuring that hazard awareness activities are more targeted according to prevailing perceptions of communities.

Quote from : "Sustainable Community Based Disaster Management (CBDM) Practices in Asia, A USER'S GUIDE"
(Dec 2004, UNCRD Disaster Management Planning Hyogo Office)

Community Based Disaster Management in Indonesia

Theoretically at present many of those actively working in the field of disaster management have tried to explain that in a series of activities that can be done to reduce or avoid disaster risks there are two main important aspects. The first is the reduction of disastrous hazards and the second is the reduction of the vulnerability of those prone to disasters. In practice, the two aspects can be accomplished by building physical constructions (in the mitigation phase) and also by arousing awareness of and increasing the capability to cope with disaster risks.

Implementation of disaster management is a series of efforts including the making of policy on development possible triggering disasters, disaster prevention, emergency response and rehabilitation.

Source: Law of the Republic of Indonesia No. 24/ 2007 on Disaster Management.

How to ascertain the level of vulnerability

Vulnerability can be interpreted differently by different groups of people as a consequence of the different needs and interests existing in each group in certain situation. Asian Disaster Preparedness Center (ADPC) divides vulnerability into four types, namely:

- 1 Physical vulnerability (age of buildings, construction, construction materials, diversity of infrastructure)
- 2 Social vulnerability (perception of the risks and traditions/habits related to culture, belief, religion, social interaction, age, gender, etc.)
- 3 Economic vulnerability (income, investment value, potential loss of resources)
- 4 Environmental vulnerability (water, air, soil/land, animals and vegetation)

Another definition as to vulnerability was made by Chambers (1989), which differentiates two types of vulnerability, namely:

- 1 External vulnerability: related to unsafe situation due to unexpected external forces and conditions.
- 2 Internal vulnerability: related to the inability to survive and cope with threats without loss/damage.

Based on these two types of vulnerability, assets like resources (human resources) and funding will influence the capacity of people to manage disaster. This depends very much on how the people manage their assets.

A “threat” is any event (whether caused by natural forces, human activities or a combination of both) that has the potential to cause damage and loss of life, property and environment. A threat that has occurred and caused any loss is called a “disaster.”

According to Lala M. Kolopaking (2008), there are at least four appropriate methods of disaster management. They are:

1. Aid distribution and emergency response (to minimize loss and damage, and for recovery)
2. Mitigation (to identify vulnerable areas and patterns of vulnerability, to build appropriate buildings and to determine spatial planning)
3. Human development (with focus on the vulnerability of the people so that integration of various economy strengthening and poverty eradication efforts can be done; including technological development)

4. Risk reduction (to increase people's capacity to minimize and manage disaster risks; people as subjects not objects)

Therefore, disaster management is based on community empowerment. In other words, it can be done as part of community development, and community based disaster management. Article 26 of the Law on Disaster Risk Reduction also explains that every individual or group of individuals or corporate body has the right to participate in the planning, operation and continuance of aid provision programs in emergency situations. People-participation in the making of decisions with regard to disaster management, especially related to themselves and their communities, is guaranteed by the law.

Reference:

- Kolopaking, Lala M.. 2008. *Pengurangan Risiko Bencana Berbasis Pemberdayaan Masyarakat*. Presentation in National Seminar on Disaster Risk Reduction held at International Convention Center of Agriculture Institute of Bogor (IPB) on 4 – 5 March 2008.
- Nasir, Akhmad, et.al.. 2009. *Mengudara Menjawab Ancaman; Geliat Radio Komunitas dalam Penanggulangan Bencana*. Yogyakarta: Combine Resource Institution.
- Twigg, John. 2007. *Karakteristik Masyarakat yang Tahan Bencana; Sebuah Catatan Panduan*. Article for DFID Disaster Risk Reduction – Interagency Coordination Group.
- ADPC. 2004. A Framework for Reducing Risk. In *CBDRM Field Practitioners Handbook*. Bangkok: APDC.
- Chambers, R.. 1989. *Vulnerability, Coping and Policy – Introduction*. IDS Bulletin – Institute of Development Studies. As quoted by Cornelia Marschiavelli. 2008. “Vulnerability Assessment and Coping Mechanism related to Floods in Urban Areas; a Community-based Case Study in Kampung Melayu, Indonesia”. Thesis for Master Degree in Geo-Information for Spatial Planning and Risk Management Faculty of Geography, Gadjah Mada University, Yogyakarta.

Chapter 2

How to Promote Community Based Disaster Management

How can we promote participation in disaster management ?

Participation is an opportunity to act. Public participation in disaster management certainly will make easier efforts of reaching the goal of building sustainability of a community. Disaster-resistant community, according to John Twigg (2007) is a utopia actually. There is no community that is fully resistant to the threats of natural disasters and other dangers related to human activities. However, as quoted by Twigg from Deis DE (2000), a community can be shaped to be able to plan and develop themselves in a hazardous environment. Vulnerability can be minimized by various actions of reducing disaster risks. So, disaster risk reduction is a combination of actions or processes done in order to accomplish sustainability.

In doing so, public participation in disaster management will require the distribution of power between the state and people. This distribution is necessary, since no single group is able to handle the entire range of disaster risk reduction. Because disasters are so complex, disaster reduction activities must include collective organization involving different disciplines and institutions. It is necessary to consider a partnership as a good form of cooperation in the context of achieving a disaster-resistant community.

This chapter focuses on community strengthening, not only its social and political aspects but also its economic and psychological aspects. People will experience empowerment through the process of participation in finding and making use of the existing local resources, among others, and increase their capacity to cope with any potential disaster.

The steps of community based disaster management in general and in villages were as follows:



Let's think about "Our Community"

Let's find out what special features our community has.

Step 1

The main actors in 'Community Based Disaster Management' activities are the people who live in the community. The first step to reduce damage caused by natural disasters is taken when each individual and the whole community act as one.

First of all, when thinking about 'Community Based Disaster Management', it is important to ask ourselves the following questions:

What is our community? Who and what composes our community?

What kind of natural disasters cause damage and loss to us?

Specific measures can be created by visualizing our community and understanding clearly what kind of disasters cause damage.

Step 1 comprises of a workshop to get to know the community better, its everyday 'problems' as well as looking at its 'strengths' and putting this information into some order.

By sorting out everyday 'problems' of the community, we will begin to notice problems related to disaster management.

On the other hand, by noticing our 'strengths', we may be able to come up with some ideas for specific measures to cope with natural disasters.

And by reviewing the 'composition' of the community, we may find out who will lead disaster management activities.

Let's take this opportunity to take a closer look at our community.

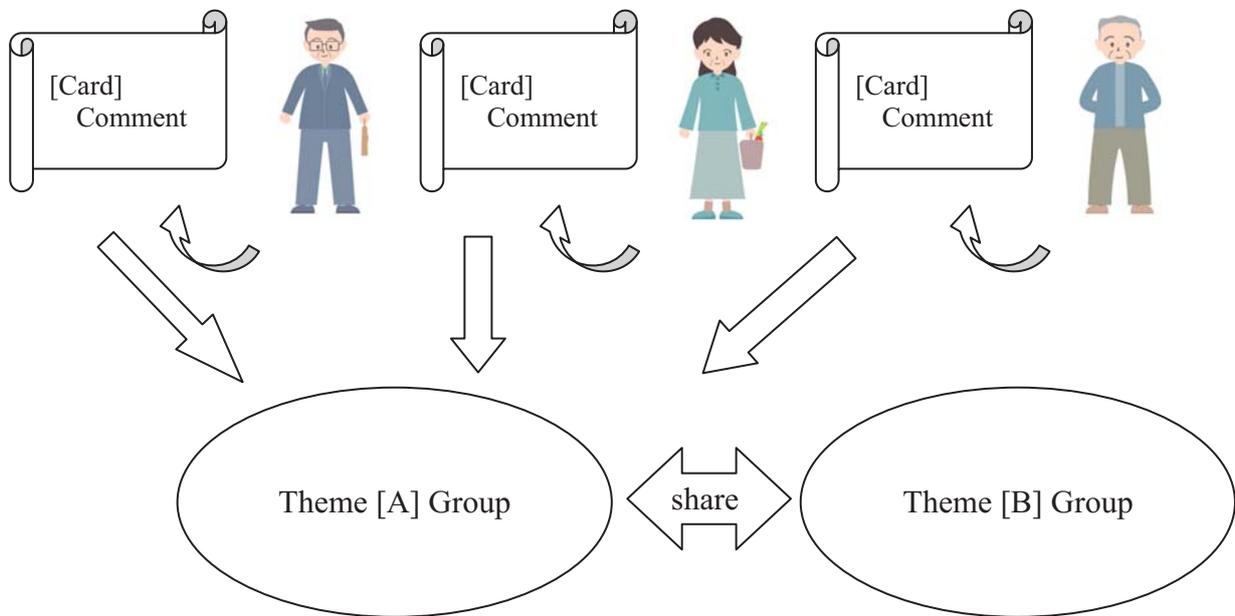


Workshop 1

Thinking about the environment of the community where everyday life occurs.

Every participant should contribute a comment. Try using the following method.

- Give comment cards to each participant.
- One comment should be written on each card, then each card should be posted on a black-board, wall, etc.
- Discussions involving all participants should take place while looking at each card.
- If necessary, groups can be formed according to certain themes. Presentations and discussions should then be held within each group.



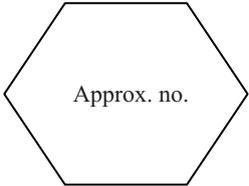
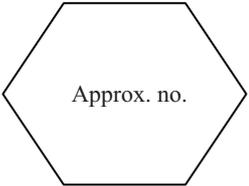
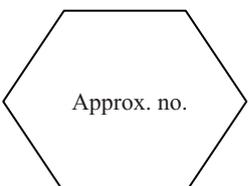
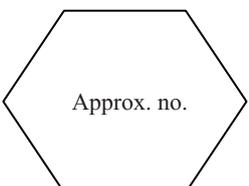
What are the geographical features or unique features of your town (village)? Write them down. (Examples) A large river flows through the west side of the town. The town faces the ocean and there is a long sandy beach. There is an active volcano, and villages are built on steep hillsides.

| | | |
|---|--|---|
| • | | • |
| • | | • |
| • | | • |
| • | | • |
| • | | • |

What kind of industries or employment is there in your town (village)? Write them down.
 (Examples) cotton farming, transport, cleaning, civil servants working in local government offices, etc.

| | | |
|---|--|---|
| • | | • |
| • | | • |
| • | | • |
| • | | • |

What is the composition of the population of your town (village)? Make a brief estimate of the demographics of the town (village).
 [Composition according to age]

| Approx. no. of males (%) | Approx. no. of females (%) | | |
|---|---|--|---|
| ~ 19 years old | 20~39 years old | 40~59 years old | over 60 years old |
|  |  |  |  |

What events or activities do you have in your community and in what season are they held? Make a presentation within each group.
 (Examples) Local events (harvest festival, etc.), cultural activities, religious events

| Season | Activity (Event) |
|--------|------------------|
| | |
| | |
| | |
| | |

What kind of disasters have you had in your town (village)? If you have actually experienced or have heard stories about a disaster that hit your town (village), tell the other members in your group about this and write it down.

| Year of the disaster | Kind of disaster | What happened |
|----------------------|------------------|---|
| (Example) 1965 | Flood | 1/3 of houses in the town flooded, 12 people died, cotton fields totally destroyed and industry badly hit |
| | | |
| | | |
| | | |



Everyone participates in the discussion. Have you been able to create a more detailed image of your community where you live and work every day?

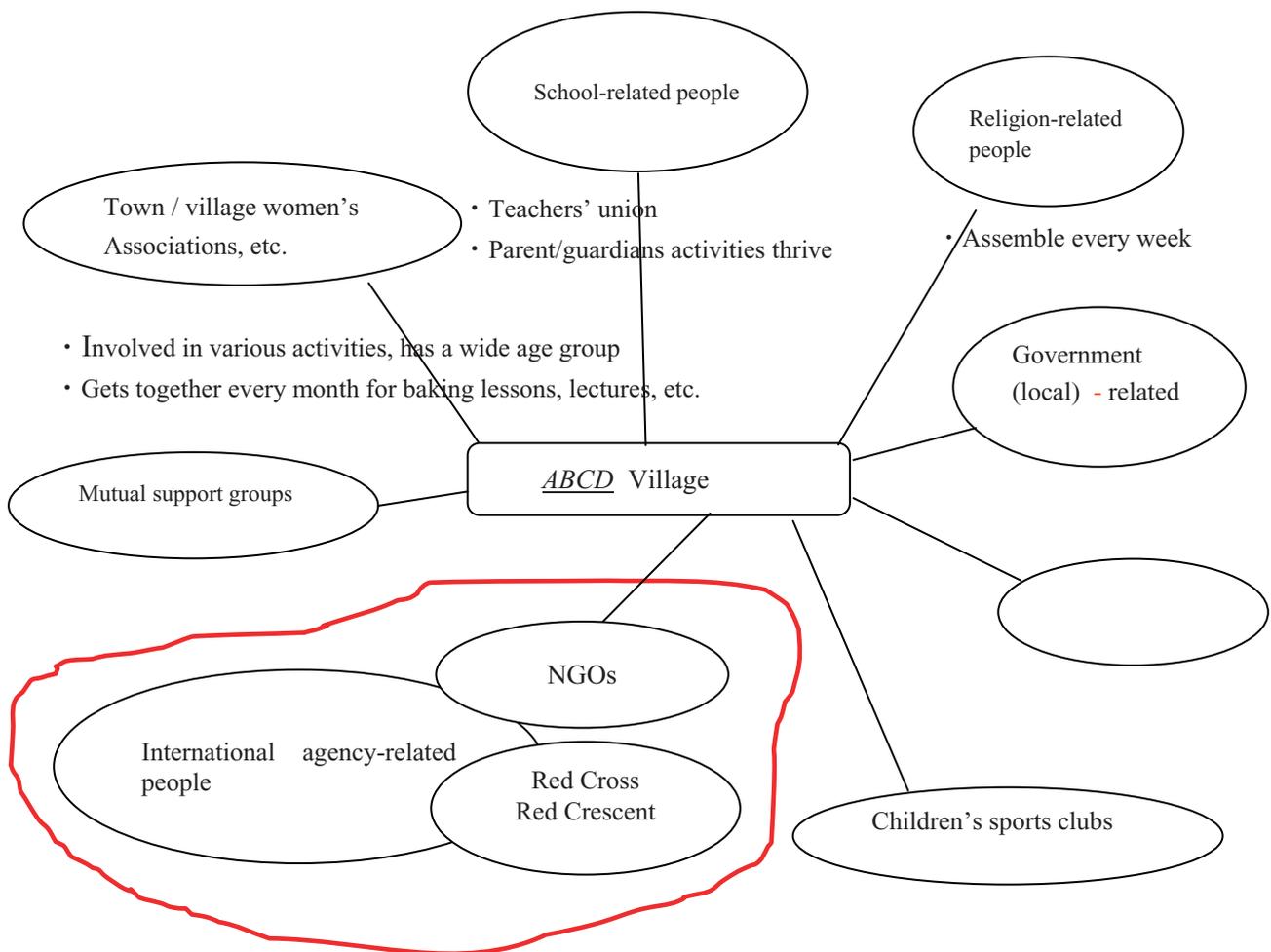
Workshop 2

Thinking about community actors (main actors/supporting actors)

What kind of people live in your town (village)?
Write down as many as you can.

| | | |
|---|--|---|
| • | | • |
| • | | • |
| • | | • |
| • | | • |
| • | | • |
| • | | • |

Put these people into groups.
Then write down specific features of each group.
Also, write down any regular activities these groups have.



Finally, outline with a red line those people/groups from outside the community who support the community.

Workshop 3

Organizing your 'strengths' and 'problems'.

What are you good at? Tell your group about your strengths and what you are good at.

(Example)

| | | |
|------------------|--|---|
| -Negotiating | | - |
| -Using computers | | - |
| - | | - |



What are your family members good at? Tell your group about what your family members are good at.

(Example)

| | | |
|----------------------|--|---|
| -Dealing with people | | - |
| -Coping with crises | | - |
| - | | - |



Finally, **what are you proud of about your community**, or what do you think is good about it? Write down little things that you are familiar with or are close to you.

(Example)

| | | |
|---|--|---|
| -There are special local products we are proud of | | - |
| -Mutual support in the community is good | | - |
| -The village festivals are popular | | - |
| - | | - |
| - | | - |

* * * * *

Now let's think about **what kind of problems your community has**.

Write down anything that comes to your mind.

(Example)

| | | |
|---|--|---|
| -There is always garbage scattered around the village | | - |
| -Sanitation and hygiene conditions are bad | | - |
| -The population is densely concentrated | | - |
| -Children do not have equal opportunities for education | | - |
| - | | - |
| - | | - |

Let's think about "Our Disaster Management"

Let's organize 'what we can do' ourselves to manage disasters.

Step 2

Step 2 is a workshop in which we will get together to talk about disasters that happen and the damage they cause and what activities we can do to reduce the damage.

First of all, we need to identify what kinds of disasters actually affect us and give concrete examples of the kind of serious damage they cause.

Next, we will need to think about what causes that damage.

Then, we will think about the reasons for those causes.

In this way, by asking "why" again and again, we will be able to get to the deep cause of the problem.

By repeating this process, the problems our community faces will come to light.

We will then think about what measures can be taken to combat these problems.

When we are thinking about these measures, we need to take into consideration the composition of our community and its 'strengths,' which we worked on in Step 1.

When we have come up with specific measures and ideas for activities, we then need to think about who, when and over how long a period these can be achieved.

We should also think about cases or scenarios for what the individual can do, and what the community as a whole can do.

Step 2 Goal

Identifying the scale and cause of disasters, and what measures can be taken
(individual measures and community measures)
are community based disaster management activities.

Workshop 1

Thinking about natural disasters that affect us and the damage they cause.

What kind of “natural disasters” do you know? Write down any that you know of.

(Example)

| |
|---------------------|
| - Earthquakes |
| - Tsunami |
| - Volcano eruptions |

| |
|------------------|
| - Heavy rainfall |
| - |
| - |

From those listed, which disasters are likely to cause damage to you?

Make a list of these.

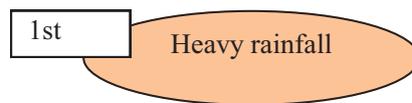
Then, place them in order of those which are likely to cause the most severe damage.

(Example)



First of all, look at the disaster listed 1st.

What kind of damage does this disaster cause to you?



Every year the river overflows and houses are flooded to under floor-level

Why does this happen? What do you think causes it?

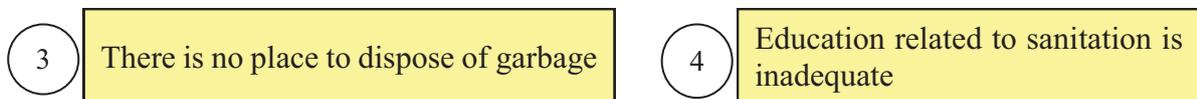
Think of one cause.



What is the cause of 1 ?



What is the cause of 2 ?



Using the same method, if possible, try to find the causes of 3 and 4.

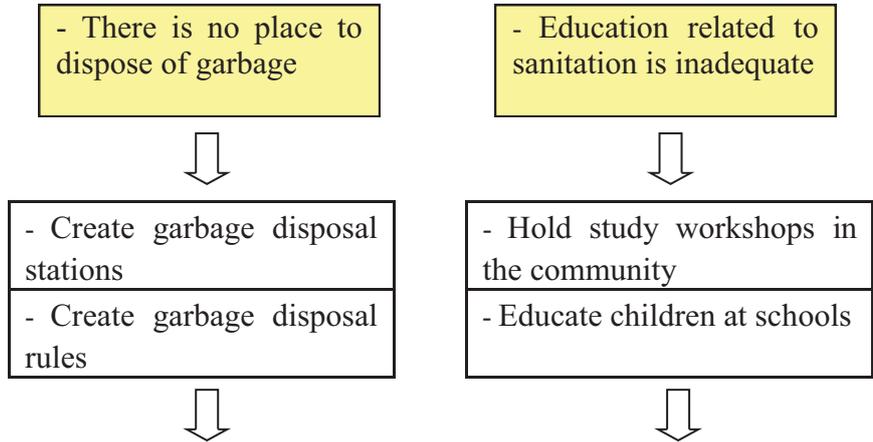
Workshop 2

Thinking about what ‘disaster management’ measures we can take.

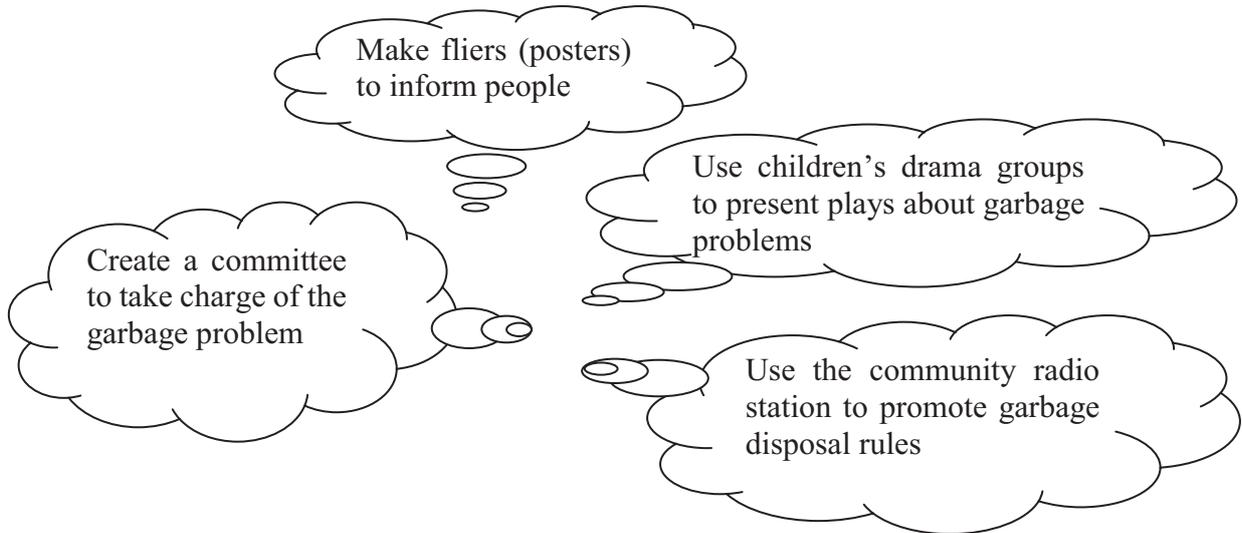
Let’s think about disaster management measures we can take against natural disasters and damage they cause which we worked on in Workshop 1.

(Example)

Let’s think about what our community can do about these problems.



Share ideas that can lead to specific ‘things that can be done.’



Let’s think about what the individual can do.

| | |
|---|--|
| -Try to produce as little garbage as possible | -Share the information and knowledge acquired with family members and neighbors. |
| -Obey garbage disposal rules | - |
| - | - |
| - | - |

Let's think about "Our Community Based Disaster Management"

Let's create a checklist by compiling Step 1 and Step 2.

Step 3

Our Community (Community Composition)

| Actor | Strengths | Problem |
|-------------------------------|--|---------|
| (Example) Women's Association | Have monthly meetings for baking lessons, etc. | |
| | | |
| | | |

Preparation for natural disaster (Example) (Disaster: Heavy rainfall, river overflowing)

| Stage | What we can do | Problem & Possible Solution | | When? Period? | Which actors? | |
|--|---|---|---|------------------|---------------|------------------|
| | | Problem | Possible Solution | | Main Actor | Supporting Actor |
| Knowing about disasters | Invite specialists and hold seminars. | How can we invite specialists | Ask the city to look for them | | | |
| Understanding the risks to the area | Survey the river, walk around and review the town, create a hazard map. | Is there anybody who can supervise or advise us? | Ask an NGO specialized in the field to help | | | |
| Know about disaster management measures | Hold workshops in the community. | How can many people's opinions be compiled and agreed on? | | | | |
| Planning measures for the area | Create a plan for cleaning garbage from the river. | | | | | |
| Put measures into action | Remove garbage from the river. Make garbage collection stations. | | | | | |
| Disaster management drills | Hold evacuation drills assuming a major flood is about to occur. | | | | | |

About Self-help / Cooperative help / Governmental help

For disaster management measures to be effective, cooperation among Self-help / Cooperative-help and Government-help is essential.

What is Self-help / Cooperative help / Governmental help?

- **Self-help = measures each individual undertakes**
- **Cooperative help = mutual support and cooperation among community residents, businesses, volunteers, specialists, government, etc. (among various people)**
- **Governmental help = measures conducted by the government (national and local)**

In addition to protecting oneself, cooperation among residents to help each other is also very important. When the Great Hanshin-Awaji Earthquake struck, many people were trapped under collapsed buildings and fires broke out simultaneously in many places.

Because the scale of the damage was far beyond expectations, rescue efforts by the government and fire departments, etc. were stretched. The amount of rescue equipment and manpower was extremely inadequate and it was impossible for firefighters to reach many sites where fires had broken out. Under such conditions, it was rescue work by local residents and local businesses that saved many precious lives and helped extinguish fires.

From these experiences, we learned that in order to protect lives from natural disasters it is necessary to have organized self-disaster-prevention activities in communities on a regular basis and to mobilize the strength of local residents' cooperation.

‘Protect your own community yourselves’

Residents in communities need to mobilize their strength on a regular basis to come up with measures to solve problems in their communities, and to find measures which will keep damage to a minimum when a disaster occurs, as well as measures for the recovery of the community. To achieve this, cooperation is very important. Cooperation among local residents, local businesses, volunteers, specialists and government authorities is also very important.

To protect the lives and property of citizens, the national and local governments are responsible for creating the best possible disaster management measures. At the same time, the government needs the support and efforts of each individual and cooperation within and from communities.

To reduce damage caused by disasters and to achieve speedy recovery, cooperation among ‘Self-help’, ‘Cooperative help’ and ‘Governmental help’ is very important.

Reference: Lessons from the Great Hanshin-Awaji Earthquake
Published by: Disaster Reduction Learning Center
Disaster Reduction and Human Renovation Institute (March 2008)

Kobe's Community-Based Disaster Prevention Organization - "BOKOMI"

Immediately after the Hanshin-Awaji Earthquake (January 17, 1995) many people rescued their fellow neighbors from collapsed buildings, tried to put out fires and helped those in need. For weeks, months and even years after the earthquake, people in the community continued to support each other in many ways. After experiencing such a large-scale disaster, Kobe City realized that its emergency services, even with support from other cities, would not be able to cope with rescue and fire-fighting activities if another major earthquake occurred. It recognized the very important work of local people and communities and decided to organize associations in each community (usually one elementary school zone). Many neighborhoods already had various groups such as residents associations, PTAs,



women's associations, elderly people's societies, welfare groups etc. Kobe City used these as a base to establish Disaster-Safe Welfare Communities which is nicknamed BOKOMI (the abbreviation of its Japanese name is "Bosai Fukushi Community"). The goal of these is to establish and develop regular communication and disaster and community safety awareness among the groups and people in the community. Community activities in Nishi Suma include: lectures on disaster preparedness, community patrols, creating community safety maps, fire prevention and first-aid activities (also for children at the local elementary school), as well as annual events on January 17 to remember and teach people about the Hanshin-Awaji Earthquake. A fire-fighting, first-aid and disaster prevention event is held each year for the 21 BOKOMI in Suma Ward.

Agenda of Community Based Disaster Management Workshop (held in Indonesia)
Implemented by Community Radio Angkringan and Community Radio Lintas Merapi

This Community Based Disaster Management Workshop took two days. The theme of the workshop was to map the vulnerability of the community. The goal of the-workshop was to: Explore the history of the village; map the village; conduct a simulation survey; report on the survey result; socialization and utilize data. Community Radio Angkringan and Community Radio Lintas Merapi created potential disaster maps in their own area. This activity was a stepping stone to encourage the people to get to know their area and its history.

| No | Activity | Details | Tools |
|------------|-------------------|---|--|
| Session I | | | |
| A | Village History | Participants are divided into two groups and asked to write down events that happened in the village on a meta card, with one meta card for one event. The cards then are chronologically arranged. The events should be common ones and also related to disasters. Every group is asked to present the results in group discussion. Similarity and differences in data will be discussed together. | Paper (A0), meta cards, board-markers |
| B | Change Propensity | The two groups are asked to make tables of Changes. Every group makes different theme. One group makes table of changes with theme of infrastructure and land use. The other group makes it with theme of occupation and communal activities. Every group shall present their tables. The correlation between the data will be discussed together. | Papers (A0), meta cards, board-markers |
| Session II | | | |
| C | Season Calendar | Participants in their groups are asked to make a table of Season Calendar or Activities based on two different themes. Group I is asked to make a table/calendar with the theme of natural seasons (planting, weather, etc), and group II is asked to make a table/calendar with the theme of local cultural activities. Each group then presents the results. Any correlation between the data will be discussed together. | Paper(A0), meta cards, board-markers |
| D | Daily Activities | Participants in the two group are asked to choose two or three occupations that will be mapped in terms of their related activities in a 24 hours time cycle. Each group then presents the result of the discussion. | Paper (A0), meta cards, board-markers |

| Session III | | | |
|-------------|--|---|--|
| E-1 | Village History 1 | Forum. Every participant is asked to draw a map on a piece of paper (A4); showing the route from their home to a landmark in their neighborhood. Each is allowed to draw their map in whatever style they like. They then present their map to the forum. | Paper (A0 size), meta cards, board-markers |
| E2 | Village History 2 | Participants in the two groups are asked to combine their individual maps into a group map on a bigger piece of paper. The landmarks become the main sites of interest on the map. Each group is asked to locate anything that is related to disaster mitigation activities on their maps. They are then asked to present their maps. | Paper (A0 size), meta cards, board-markers |
| Session IV | | | |
| F | Survey Simulation | Participants in the two groups survey two different areas. They survey variables that have been chosen to be mapped and documented. Division of the area can be based on administrative areas (e.g. hamlet) or on geographical borders. Each group will be accompanied by a facilitator. | Base maps, survey forms, notebooks, pens |
| G | Formulation and Report of the Survey/Mapping Results | Each group compiles the obtained data into a database format that has been agreed upon. The survey map is also transferred onto their group map (A1). Each group is then asked to present the results of their mapping and to discuss their correlation to the results of other groups' results. | Base maps, survey forms, notebooks, pens, paper (A0 size), LCD projector |
| Session V | | | |
| H | Socialization and Utilization of the data | Participants are asked to discuss the steps toward utilizing the data from the mapping results. The discussion is directed to put the data into information that can be used by the community. In accordance with the goals of the workshop, the type of information will be adjusted to match the activities of the local community radio station's on air and off air activities. | Paper (A0 size), meta cards, board-markers, LCD projector |

Compiling a Village History

In this session the people wrote about previous incidents in their village on meta cards. One meta card was for one incident. The cards were then chronologically arranged. The incidents written started from general topics and on to incidents related to disaster. Each group was asked to present and discuss the results. The common and different findings were then discussed.

In the activity of digging up their village history, Angkringan found some notes of not only natural but also social disaster. Natural disasters were, in fact, not only the earthquake in 2006, but also flooding, landslides and tornados.

The people realized that incredible and new findings were either natural incidents or social incidents that occurred during the last 40 years.



| DINAMIKA Pekerjaan | | 1930-1975 | 2000 | 2005 | 2009 |
|--------------------|----------------|-----------|-------|------|------|
| 1. Guru | 1 Guru | 300 | 300 | 300 | 300 |
| 2. Petani | 2 Petani | 6000 | 6000 | 6000 | 6000 |
| 3. PNS | 3 PNS | 1177 | 22777 | 2277 | 2277 |
| 4. Pedagang | 4 Pedagang | 555 | 555 | 555 | 555 |
| 5. Mahasiswa | 5 Mahasiswa | 555 | 555 | 555 | 555 |
| 6. Pengangguran | 6 Pengangguran | 88 | 88 | 88 | 88 |
| 7. Wiraswasta | 7 Wiraswasta | !! | !!! | !!!! | !!!! |
| 8. Buruh | 8 Buruh | 6 | 66 | 666 | 666 |

Compiling Social and Environmental Changes

Participants were still divided into two groups. They were asked to make a table of the tendency in changes. Each group worked on different themes. Group I worked on the theme of infrastructure and field management. Group II worked on the theme of people's means of livelihood and activities. Each group then presented their own table. The correlation between data was discussed together.

The change of land management became an interesting discussion. Findings on village land expropriation by the regency government became the attention of the Angkringan community radio station. Changes in the people's means of livelihood often happened. Most people were farmers, but then they changed their occupation to employment in either the handicraft or construction industries.

In the Merapi area, one change faced was sand mining which was carelessly done. Every day, miners mined using heavy machinery. This caused scouring on the people's farmland. Indirectly, this will be a new disaster threat for them.

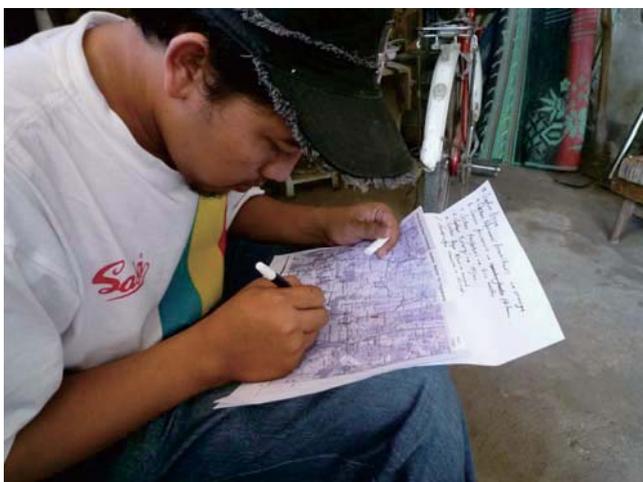
Compiling a Village Map

Each participant was asked to draw a map on a piece of A4 paper which showed the route from his/her house to a landmark. Each participant made the map in their own style and then presented it in front of the forum.

Participants in the two groups were then asked to combine the individual maps into a group map on plain paper. The landmark became the main spot on the map. Each group was asked to explain general things related to disaster prevention activities on their map. Then they presented their own map.

The management of Angkringan community radio and the local people created signs for the landmarks in Timbulharjo. The main landmarks related to disaster management are human resources (doctors, midwives, medical aides, teachers, etc.), energy resources (gas stations, etc.), means of information (HT), public spaces (fields, parks, places of worship, and schools) and infrastructure (streets). The first mapping was done at Angkringan's studio.

In reducing disaster risk, it is essential for the people to know their area well. Especially in the Merapi Volcano area, the people must know evacuation routes and refugee camps. The finding was that they clearly understood the landmark spots which were integral parts of disaster prevention such as patrol station, evacuation routes, possession of HT, vehicles, refugee camps, sources of energy, and communication tower provider. This knowledge has become one of the main assets when a volcano disaster happens. The people will be able to take fast responsive actions to disasters.

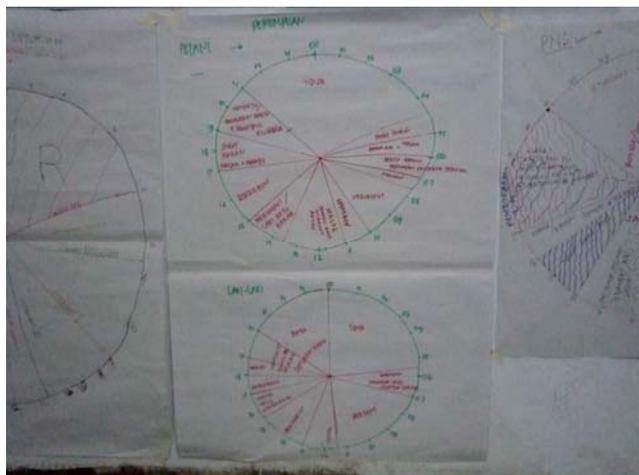


Compiling a Season Calendar

The participants in the two groups were asked to make a table of a season calendar or activity on different themes. The 1st group made a table/calendar on natural seasons (plants, weather, etc) and the 2nd group a table/calendar on cultural activities. Then the groups presented the results. The correlation between the data was further discussed.

The mapping results showed the number of changes from a cultural and seasonal point of view. Changes in the seasons influenced planting patterns and changes in culture made it difficult to maintain the local culture of Timbulharjo.

The important finding in this session was the uncertainty in seasons. This change was caused by global climatic change which has affected their area. Previously, the people employed local wisdom in telling by viewing natural signs. However, now they no longer do so.



Compiling a Day Schedule for the People

The participants in the two groups were asked to choose two or three occupations whose schedule would be mapped. Each occupation's activities over a period of 24 hours were mapped. Each group then presented their findings and discussed the results. The findings would be used to determine on air hours of material for community radio broadcasting and type materials conveyed.

Timbulharjo is located 8 kilometers south from the center of Yogyakarta. More than 20,000 people dwell in this village and are scattered in 16 orchards and 148 RT. The people being spread out and the area being wide caused Timbulharjo to have a more complex occupational pattern among its people. It was no easy task for Angkringan activists to map the people of Timbulharjo's daily activities as a whole. Therefore, the majority profession was chosen.

The people and Lintas Merapi radio community activists mapped people's activities. Most of them were farmers, men and women. Another interesting point was participation of children in this activity.

Survey Simulation

Participants in the two groups surveyed two different areas. They surveyed certain variables to be mapped and documented. Area division was based on an administrative area (such as orchards) or geographical borders.

Community radio activists checked and rechecked the results of the 1st mapping done at the studio. They mapped throughout Timbulharjo. There were new findings which became input for a big map of Timbulharjo.

From the field study and discussion in the village mapping session, the people and Lintas Merapi community radio activists found some essential landmarks which changed their function or were even obsolete.



Compiling and Formulating the Survey/Mapping Report

Each group compiled all the results of the survey using an agreed-upon database format. The survey map was also transferred to a group map (A1 size). Each group was then asked to present their mapping results and discussed their correlation with another group's mapping.

Next, the two groups met at Angkringan studio after doing field checking. Further, the collected data was filled in on a big map of Timbulharjo.

Based on the results of village mapping and field study, the people and Lintas Merapi community radio activists compiled all the results of the survey into an agreed-upon database format.



Arranging Propagation and Use of the Fund Plan

The participants were invited to discuss steps on how they might use the mapping data. The discussion was directed toward how to process the data to suit local community radio broadcasting, either on air or off air.

Discussion was directed toward how to present the data information which can be passed on to the community. Besides knowing the precise time to convey DMAM to the people, it was noted that the language should be more effective and understandable to listeners. Furthermore, the pattern of precise activities that can be carried out in Timbulharjo was also formulated. The activities were both in on air and off air form.

Plans were made to compile audio materials by consulting with BPPTK and creating supporting activities to strengthen the process of reducing disaster risk.

The Roles of Community Radio in Disaster Management

Recent disaster management paradigms consider all efforts to be part of a mitigation cycle (emergency response – recovery). Two of the most important factors within this cycle are information and communication, both of which are extremely influential in reducing disaster risks. Information and communication frameworks that raise community awareness must be put in place before disaster strikes, so that residents can be more responsive to their vulnerability and threats of disaster. If a disaster does occur, early warning and emergency response systems created through the benefits of information and communication technology can play an important role in disaster mitigation. After the disaster, information and communication continues to be needed in recovery, reconstruction and rehabilitation.



Information and communication have not been fully developed as the main part of disaster management in Indonesia. Most practices consider it as a supporting system that has not been integrated into comprehensive disaster management. In fact, information in the field of disaster management is a basic right of every citizen. Quick, accurate and appropriate information can ensure people's ability to get shelter and survive a disaster. However, judging from a few experiences in disaster

situations in Indonesia and Japan, there have been some instances in which information and communication technology have been used to support disaster management. It is interesting that some communities have utilized a form of information technology that is close to their daily lives: community broadcast radio.

The use of community broadcast radio, more simply called “community radio,” in several countries shows that the radio can play an important role in carrying out disaster management efforts. Community radio is often more accepted by its surrounding communities because its programs are made in accordance with local social and cultural conditions. Therefore, information can easily be accepted by residents.

In Indonesia, community radio is also related to the guarantee by law that recognizes the role of communities in the context of disaster management. As stated in Article 26 Paragraph 1 of Law No. 24/2007 on Disaster Management, the existence of community radio with its practices is a form of public participation in the making of decisions relating to disaster management. In its role as a medium, Government Regulations No.51/2005 also recognizes community radio as a legal broadcasting agency that has the right to disseminate information to the public.

Chapter 3

What is DMAM (Disaster Management Audio Materials) for Community Radio Broadcasting ?

Disaster Management Audio Materials CD-ROM (DMAM)

Disaster Management Audio Materials for Community Radio Broadcasting CD-ROM (DMAM) contains audio materials in **9 languages** which can be broadcasted easily and speedily on local community radio stations in developing countries when natural disasters such as earthquakes and tsunami occur.

The DMAM was created by **the Disaster Reduction Learning Center (DRLC)** which was jointly established by **JICA** (Japan International Cooperation Agency) and **Hyogo Prefectural Government**. It was developed to be used as an educational material for JICA Learning Programs. And at the same time, through **the AMARC (World Association of Community Radio Broadcasters)** network with over 5,000 member stations worldwide, this tool will help community radio stations and local communities to strengthen their disaster preparedness, providing them with easy access to disaster management audio materials.

The background

In the Asia-Pacific region where there are many disasters such as earthquakes and tsunami, great expectations have been placed on community radio as a powerful tool to foster rescue and rehabilitation activities. The view of “Developing Community Radio for Disaster Management” is prioritized in AMARC Asia-Pacific Action Plan (2007~2010) with the aim of developing its disaster management capacity through development of media contents as well as related training.

The most advanced illustration of this was in **the Great Hanshin-Awaji Earthquake in 1995, and the Sumatra Earthquake and Indian Ocean Tsunami in 2004**. In November 2006 at the workshop “Community Radio and Disaster and Recovery” at the 9th AMARC World Conference, the important role of community radio stations played in these tremendous disasters was reported. This provided the first opportunity to share experiences. The next step was to fulfill the need for development of training and contents based on their experiences. This tool is the answer to that need.

The contents

This tool contains, on a single CD-ROM, **193 audio and text messages in 9 languages (English, Chinese, Thai, Tagalog, Indonesian, Vietnamese, Portuguese, Spanish, Russian)** for broadcasting on community radio stations when **4 types of disasters** (earthquakes, tsunami, landslides and floods) occur.

It offers you easy operation: simply insert the CD-ROM in a computer and start the Web browser. Community radio stations can easily provide disaster related information to their listeners and local communities.



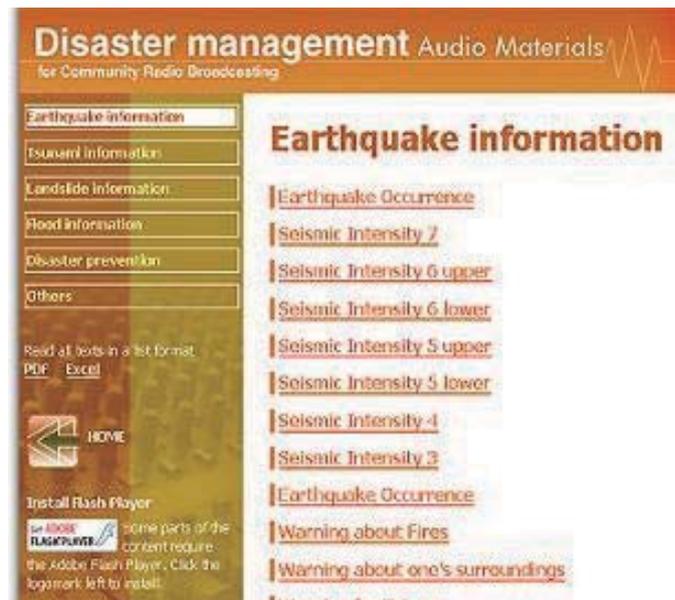
Operating Instructions

- (1) After the computer reads the CD, the Top Page will appear. Select a language.
- (2) Select one of the following 6 disaster categories; Earthquake Information, Tsunami Information, Landslide Information, Flood Information, Disaster Reduction, Others.
- (3) A list of disaster information classified by type will appear. After selecting one of these, the audio material download page (window) will appear.

<the Top Page> select a language



<the list of disaster information >



- (4) Below is the page (window) from which the audio files (MP3 files) can be downloaded.

*File name for each language

| | | | |
|------------|------------|------------|------------|
| English | en_***.mp3 | Vietnamese | vn_***.mp3 |
| Chinese | cn_***.mp3 | Spanish | es_***.mp3 |
| Tagalog | tg_***.mp3 | Russian | ru_***.mp3 |
| Thai | th_***.mp3 | Indonesian | id_***.mp3 |
| Portuguese | pt_***.mp3 | | |

Application of the materials

Messages can be edited to create an original audio package for broadcasting in times of disasters. Refer to **the text message list** of the audio materials and select or rearrange the needed items with audio editing software or a player (ex. iTunes, Windows Media Player). It is recommended to prepare the audio content package to suit individual need in advance. Through this process your radio station will be prepared and enlightened to put the disaster management concept into practice.



downloaded

Audiosoft player



the text message list

| Flood information | | |
|---------------------------------|--|---|
| Information about flooding | | |
| T045 | | Flooding is caused by continuous |
| T046 | | Flooding arises from massive influx of seawater, earthquake |
| T047 | | Flood can be identified as the 4 |
| Flash flood | | |
| T048A | | Flash floods are caused by heavy flooding usually occurs within sudden, and difficult to escape |
| T049 | | ding may occur (Excel or PDF), river shores, stream |
| Exceeding flood (Raining flood) | | |
| T050A | | Exceeding flood is caused by overflowing water inundates the |

DMAM can be also used for **disaster reduction activities in everyday life.**

For example, the materials can be arranged to create disaster reduction games and activities in your communities.



Examples for application of DMAM in normal times

Basic application

DMAM is not only for community radio activity use. The audio materials can be used by regional resources, such as people involved in disaster risk reduction, the community, NGOs, schools, etc., as well as in workshops and disaster reduction education.

The audio materials are just that, materials. Because they are materials they can be used freely and creatively. They can also be altered in many ways to suit the culture and customs of each country and region.

Below is an example of basic application of DMAM together with examples of development application.

Start up the DMAM CD-ROM and using the Text as a guide, choose a *language* and (*disaster*) *information* category to combine audio materials suited to your needs. Besides those chosen, discuss what kind of information your own region (community) needs and create new original audio materials.

Comment: Through this process, with the community, you will be able to rethink *disasters*, *required information in times of disaster* and *disaster reduction knowledge*. By carrying out this process *together*, solidarity will grow among the people in the community. The process of people getting together and actively exchanging opinions itself becomes a strong *community disaster reduction force*.

If necessary

Change the materials to your local language or dialect.

Comment: Translating the materials into the local language or dialect can help promote DMAM and disaster reduction awareness in the community.

Create text and audio materials for disasters, such as a *volcanic eruption* or *snow avalanche*, which are not included in the DMAM.

Comment: The DMAM contains a limited number of disasters. The materials can be used as a sample plan for the creation of original audio materials suited to the needs of the region. The workshop model on Chapter 2 (page15) can be used to help identify types of disasters in your region.

On the following pages, you can see how audio materials created for the community through basic application can be developed.

Examples for application of DMAM in normal times

Development application

Disaster reduction education application

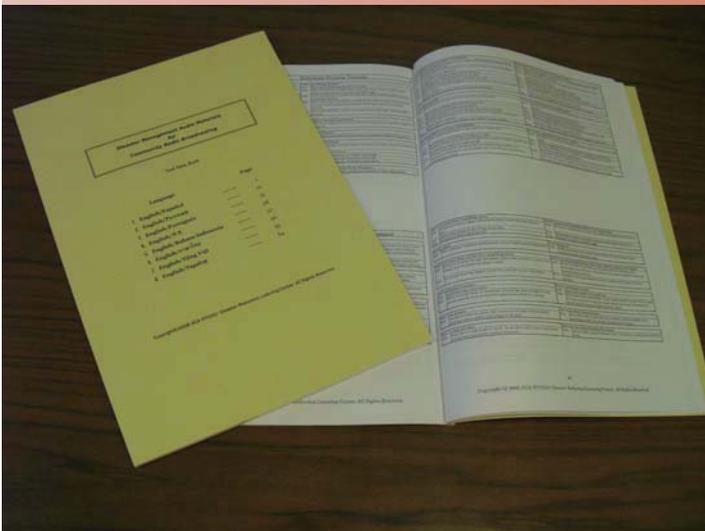
Using the audio materials compiled from the basic application, disaster reduction quizzes and board games can be created and used in schools.

Comment: Using the information in the materials, true(O)/false(X) quizzes and board games simulating action to be taken when a disaster occurs can be created to encourage children to learn about disaster reduction in a fun way. It is also very effective for children to form groups to create quizzes and compete among themselves. It is important that children do not become *passive*; they should be *actively* involved at all times. With some creativity, audio materials can be used in many new ways.

Community disaster reduction application

Using the audio materials compiled from the basic activities, plans can be formed for disaster reduction drills such as community evacuation and information circulation drills, etc.

Comment: Using the materials compiled from the basic application, plans can be created for evacuation drills and information circulation drills which include various sectors (government [local], local community, etc.) When doing this, it should be decided which sector should pass on which *information* and *to whom* when a disaster occurs. This should be followed by evacuation drills for the whole community using the audio materials.



Local media (community radio, cable television, etc.) application

Using the materials contained in the audio materials as a base, create disaster reduction promotion programs taking into consideration the culture, customs and environment of the country and region.

Comment: The audio materials are just that, materials. They can be used to create dialogs for dramas, lyrics for songs, etc. or for other mediums which are readily and easily accepted by local people to promote disaster reduction. In Indonesia, local people used the DMAM for inspiration to create comical skits, poetry for recitation, etc. Examples of this can be seen in Chapter 4. Please see page 46.

Conducting such activities in normal times contributes to community response in times of disaster.

Keep the following 2 points in mind when applying DMAM

- 1. Apply DMAM in normal times assuming real disaster situations (disaster reduction drills, evacuation drills, etc.)**
- 2. Apply DMAM in normal times to promote disaster reduction awareness (disaster reduction education, application by media, etc.)**



Chapter 4
**How to Utilize DMAM for Community
Based Disaster Management**
~Let's learn from the experience of Indonesia~

How to Utilize DMAM for Community Based Disaster Management ~Let's learn from the experience of Indonesia ~

JICA Hyogo/DRLC, AMARC JAPAN Working Group and Combine Resource Institution (CRI) organized two workshops on community based disaster management utilizing community radio (CR) in Central Java, Indonesia. One workshop was held on the 2nd and 3rd of August in Timbulharjo Village, Bantul, Yogyakarta. The village was hit by a big earthquake in May 2006 in which 300 people in the village died. Another workshop was held on the 4th and 5th of August, 2009 in Sidorejo Village, Klaten, Central Java, which is located on the famous volcanic mountain 'Merapi' and always faces the risk of volcanic eruption and landslides. The community radio station, 'Angkringan Community Radio' in Timbulharjo Village and 'Lintas Merapi FM Community Radio' in Sidorejo Village, operate in each area. More than 40 participants from local community radio stations, other community radio stations in Indonesia, national /local governments, NGOs, JICA Indonesia and the mass media attended the workshop.

Objective

The workshop was one part of a pilot project to promote and raise community awareness of Disaster Risk Reduction utilizing community radio carried out by JICA Hyogo/DRLC, AMARC Japan Working Group and CRI from June 2009 to January 2010. The aims of the project were as follows:

- 1. Developing the disaster management ability of the community.**
- 2. Developing the disaster management ability of community radio activists through on-air and off-air activities.**
- 3. Evaluation of Disaster Management Audio Materials for Community Radio Broadcasting (DMAM) produced by JICA Hyogo/DRLC and AMARC Japan Working Group, and receive input regarding its contents, wrapping and delivery.**
- 4. Developing local audio materials/programs for disaster alert and disaster risk reduction to be broadcast in local community areas.**



Activities

In the community workshop which was held in August, participants shared results from the workshop session on mapping potential community vulnerabilities, and then produced their own audio programs on disaster risk reduction by tailoring DMAM materials to suit their own communities. The programs tried various techniques such as incorporating traditional music, comedy sketches, etc. to attract listeners in the community. The workshop provided an important opportunity to community radio activists to discuss the roles of community radio in raising community awareness of disaster risk reduction together with community members, and not confine disaster management activities to radio broadcasting, but expand them to off-air activities such as holding disaster memorial events, sponsoring a song contest with the theme of disaster, etc.

After finishing the workshop, the participants from community radio stations continued to produce new audio programs to raise community awareness of disaster risk reduction. CRI and the community radio stations are measuring the impact of broadcasting these programs in the community. In addition, they implemented off-air activities such as sponsoring a traditional singing contest with a disaster early-warning system that could be incorporated into their community radio's program content.

The following several activities were promoted to achieve the aims in Indonesia and Japan until March 2010.

- 1. Community Workshop (August 2009), including Pre Workshop (July 2009)**
- 2. The implementation of a Community Radio Program for disaster alert and disaster risk reduction (from August, 2009 to December, 2009)**
- 3. The implementation of off-air activities conducted by community radio activists and community members (from August 2009 to December 2009)**
- 4. The publication of a handbook on how to utilize DMAM in community based disaster management (from October 2009 to March 2010)**

The AMARC Japan Working Group introduced an audio product as a step to reduce the risk of disaster at the Asia Pacific community radio meeting in Yogyakarta on 17-20 October 2008. The product was named Disaster Management Audio Material (DMAM). The application of DMAM has been carried out by some community radios in Indonesia even though they do not specifically call it DMAM. To follow up on the meeting, JICA Hyogo/DRLC, AMARC Japan Working Group and Combine Resource Institution (CRI) made an effort to support the real application of the original version of DMAM. It covers:

- Information for Earthquakes
- Information for Tsunami
- Information for Landslides
- Information for Floods
- Prevention of Disasters
- Others, such as how to deal with rumors, sympathy and support, safety, and news on radio.

Agenda of DMAM Workshop (held in Indonesia)
implemented by Community Radio Angkringan and Community Radio Lintas Merapi

Workshop participants discussed mapping the degree and scope of community vulnerabilities. With the participation of community representatives and the activists of community radios, this workshop provided feedback regarding the DMAM audio materials.

The feedback from the workshop participants regarding the DMAM audio materials became the basis for discussion on how to modify the audio materials in order to match each community's needs.

| Materials | Method |
|---|---|
| <p>Mapping the potentials of disaster threats:</p> <ol style="list-style-type: none"> 1. Mapping potential natural disaster threats 2. Mapping potential non-natural disaster threats 3. Mapping potential social disaster threats | <p>Focus Group Discussion (FGD). The participants are divided into three groups. Each group is required to make a map of the area on plain paper for their own group. Each group will then have one issue to deal with. By using the map already drawn, each element of the issue is written on a meta card to attach to the map to present later in front of the plenary session.</p> |
| <p>Mapping the potential resources of the community:</p> <ol style="list-style-type: none"> 1. Natural resources 2. Infrastructure 3. Information and communication systems 4. Transportation system 5. Energy resources 6. Human resources | <p>Focus Group Discussion (FGD). The participants are divided into three groups, each of which will have two issues to discuss. The discussion will still be assisted by the area map. The elements of the issues discussed are then written on the meta cards to attach to the map to present later.</p> |
| <p>Analysis on the vulnerability toward disaster:</p> <ol style="list-style-type: none"> 1. Analysis on the vulnerability of the community radio 2. Analysis on the vulnerability of the community | <p>Focus Group Discussion (FGD). The participants are divided into two new groups, each of which will have one issue to discuss. The definition and criteria of the vulnerability are presented first by the facilitator. Next, each group will discuss the variables of the vulnerability mentioned and write them on the meta cards to present later in front of the plenary session.</p> |
| <p>Evaluation on the audio materials in DMAM</p> | <p>The participants are still grouped in two groups as earlier. Each group will listen again to the audio materials focusing on disaster produced by JICA Hyogo/DRLC and AMARC Japan Working Group. An evaluation will then be conducted by responding to the list of guiding questions asked by the facilitator to the participants. The list of the participants' responses will be mapped on the meta cards and discussed in groups and plenary session to formulate recommendations for the development of audio materials.</p> |

| Materials | Method |
|---|---|
| <p>On-air activity management</p> <ol style="list-style-type: none"> 1. Production of the audio materials focusing on disaster relief 2. Broadcasting management of audio materials focusing on disaster relief | <p>Through FGD, the community radio activists will be presented with the evaluation results and input for the audio materials produced by JICA Hyogo/DRLC and AMARC Japan Working Group. Community radio activists are expected to respond to these results by producing community versions of the broadcasting programs.</p> |
| <p>Off-air activity management</p> <ol style="list-style-type: none"> 1. Planning field activities to support the broadcast of the audio materials focusing on disaster relief | <p>In the second session, the discussion will be more about the off-air promotion strategies that can be done by community radio activists. Through FGD, it is expected to get ideas from activists that can be integrated into audio programming (on-air and off-air).</p> |



How to Utilize DMAM for Community Based Disaster Management

For the application of DMAM, two community radio stations in Indonesia were chosen; Angkringan Community Radio in Timbulharjo, Bantul Yogyakarta and Lintas Merapi Community Radio in Deles, Klaten, Central Java. Both of them are located in areas which were most seriously affected by two different disasters. Angkringan Community Radio is close to where an earthquake struck, while Lintas Merapi Community Radio had to deal with a volcano eruption.

In those two locations, DMAM produced by JICA Hyogo/DRLC and AMARC Japan Working Group was broadcast. At Angkringan Community Radio, the management combined some materials in DMAM which became items, such as; see page 44

About Angkringan Community Radio

On May 27, 2006 at 5:53:58 AM local time, an earthquake occurred in Yogyakarta and its surrounding areas. The epicenter of the earthquake was located on S 7,962° and E 110,458°, about 20 km SSW of Yogyakarta or 455 km ESE of Jakarta with a depth of 10 km. The magnitude of this earthquake was 6.3 on the Richter scale. With this quite strong earthquake which occurred inland, severe damage of houses, buildings, and other infrastructure in Yogyakarta, Bantul and the surrounding areas followed, and the disaster also took many lives.

Looking at the history of earthquakes in Yogyakarta, Yogyakarta has suffered from some destructive earthquakes. In 1867, a destructive earthquake also occurred claiming many lives and causing many injuries. It also caused severe damage to buildings and infrastructure over an extensive area. Another earthquake occurred in 1943 and claimed as many as 213 lives (31 of whom died in Yogyakarta), 2,800 houses were damaged, and the most damaged areas were Kebumen and Purworejo. An earthquake also shook Yogyakarta and surrounding areas in 1981, however, it did not result in any deaths or destruction.

According to a survey, in the earthquake that occurred on May 27, 2006, more than 6,000 people died, around 50,000 people were injured, 86,000 houses collapsed and approximately another 283,000 houses suffered damaged ranging from minor, moderate to severe. The most severe damage took place in Klaten, Piyungan, Imogiri and Bantul.

One of the community radio stations that was hit by the earthquake of May 27, 2006 was Angkringan Radio situated in Timbulharjo village, sub-district of Sewon, Bantul, 6 km from the epicenter (Sesar Opak) or 9.5 km from Yogyakarta downtown. The earthquake caused Angkringan Radio to have to broadcast its programs from a temporary studio in an evacuation camp (refugee shelter) in Kepek, Timbulharjo. The former studio in the Timbulharjo village meeting hall complex was badly damaged, and the station's antennae tower shook because its bolts had been pulled out of the ground. The equipment for broadcasting was also damaged. The mixer was shorted because it had fallen from shelves, and the computer needed reinstalling. The radio station which broadcasts on frequency 107.9 has already returned to its former studio which has been renovated.



About Lintas Merapi FM Community Radio

Merapi volcano is one of the most active volcanoes in the world and has a high potential for disaster including eruption, volcanic mudflow, drought, and tornadoes. This volcano is located in the northern part of Yogyakarta Province and most of the Central Java area. From 1006 until February 2001, this volcano erupted 82 times in volcano eruption cycles. They are classified into: short cycle (2-5 years), medium cycle (5-7 years) and long cycle (more than 30 years).

The intensive activity of Merapi brings threats to the people living on its slope. The dangers of its eruption consist of primary danger and secondary danger. Primary danger is direct danger to the residents when an eruption happens. For example, rock and materials thrown by the force of the eruption. Secondary dangers are indirectly experienced by the residents and usually occur after the eruption, such as lava flow, damage to plantation/farmland and houses. In other words, secondary danger is the side-effects of the primary danger. Based on the collected data, since the 15th century, every time Merapi erupts, it always takes lives, even though the number tends to decrease.

One of the community radio stations which operate on Merapi is Lintas Merapi. It is located in Deles, Klaten, Central Java. It lies 4.5 km on the southern part of the mountain, under the top of Merapi. The radio whose frequency is 107.9 Mhz is utilized by people as an information media for Merapi disasters. For example, it is the media that provides alerts on mudflows and information about Merapi volcanic activities. When Merapi is safe, it is used as a media for disaster reduction education using own their version of disaster reduction materials.



How to Utilize DMAM for Community Based Disaster Management Listening to DMAM (Before Community Workshop)

Angkringan Community Radio

Alerts in Earthquake Area:

V054 Wear shoes or sandals at all times

V055 Do not enter collapsed buildings

V056 Do not stay in narrow alleys or beside a wall to avoid being injured by falling roof-tiles and collapsing walls.

V057 Do not stay on mountain sides or riverbanks, where landslides easily happen.

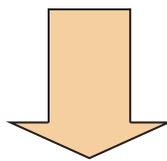
V059 Do not touch broken cables.

V060 Protect your head with a helmet, hat, mattress, etc.

The compilation was then broadcast between 7-9 pm. Further, the management of Angkringan made a program soliciting input from listeners about DMAM. This was carried out by using survey questionnaires. As a result, listeners judged that DMAM materials were very important and relevant. However, they felt that the narrator spoke too fast and they hoped the local language would be used in the DMAM materials.

Lintas Merapi FM Community Radio

In contrast, on Lintas Merapi Community radio, DMAM did not have materials for volcano eruptions. The presentation of DMAM at Lintas Merapi gained a positive response. The DMAM by JICA Hyogo/DRLC and AMARC Japan Working Group was the inspiration to create a new DMAM Lintas Merapi version on volcano eruptions.



In general, the result of playing the original DMAM version provided some inspiration to both Angkringan and Lintas Merapi to reduce disaster risk. How, then, did they turn this inspiration into reality? In order to understand the application of DMAM by Angkringan and Lintas Merapi, we first have to know a little about both of them.

How to Utilize DMAM for Community Based Disaster Management ***The Application of DMAM (in Community Workshop)***

Following are the set of activities carried out by Angkringan and Lintas Merapi in order to create their own version of DMAM after they had tested the original DMAM. The activities were as follows:

Workshop

Materials which should be presented by community radio in the workshop:

The history and development of disaster threat potential.

A map of disaster-threatened locations and resources

A calendar of daily activities and schedules as a guide for both on-air and off-air programs

Audio materials on disaster management by JICA Hyogo/DRLC and AMARC Japan Working Group.

Angkringan Community Radio

The series on DMAM application continued. It was not merely a workshop resulting in a few important notes for the people of Timbulharjo, but also for Angkringan Community Radio activists. The workshop was an event for meeting as well as presenting the results of activities preceding the workshop to other parties including the village government, district government, academics, and community radio observers. In Timbulharjo, the workshop was carried out for two days. It was represented by Mr. Sarjiman as the head Angkringan community radio management. He described the results of pre-workshop activities to the people and guests. Documents presented included those on threat potential and resources mapping in Timbulharjo. In the workshop, some responses emerged regarding DMAM by JICA Hyogo/DRLC and AMARC Japan Working Group, such as the opinion that the narrator delivered the materials very quickly and in Bahasa which cannot be understood by all people. A recommendation for DMAM production for Timbulharjo was the use of the local language, Javanese. Moreover, the first day's discussion also resulted in a recommendation to use the local culture in delivering messages about disaster risk reduction. Specifically, it was suggested that *macapat* (Javanese song) be used as a medium for both conveying messages and preserving local culture.

Lintas Merapi FM Community Radio

It was time for the activists and the community to design activities involving more parties such as village government, district government and even the regency government. A rare event also happened at the workshop performed by Lintas Merapi community radio. It was attended by Prof. Ir. Sarwidi, of The Commission of National Disaster Prevention Division Director (BNPB) of Indonesia and a representative from the national media-TEMPO. At the workshop Prof. Sarwidi said that the existence of community radios in the efforts to reduce disaster risk was very important. Community radio has a role to play at each stage of disaster prevention, such as before the disaster, during the disaster, and after the disaster.

The event began with a report on pre-workshop activities and, the mapping of threat potential and village resources, which was followed by a discussion on the important role of the community radio in disaster. The regency government party noted the importance of the workshop. According to Prof. Sarwidi, pre-workshop activities and the findings became a kind of social fund for the people and Lintas Merapi community radio to take steps in reducing disaster risk.

How to Utilize DMAM for Community Based Disaster Management Producing Localized Audio Program (in Community Workshop)

Audio Materials for Disaster Prevention with a local version were produced by individuals of community radio stations.

Angkringan Community Radio



Based on recommendations from the first day, Angkringan Community Radio activists together with the people made audio material scripts on disaster prevention for the Timbulharjo version. The discussion process was very interesting. Angkringan Community Radio activists, who were mostly young, blended well with the old people. They learned about each other in order to make the message understandable, and then developed new ideas such as comical skits and traditional poetry for recitation in a local language which have messages of disaster risk reduction. Having this step done, production continued with the presentation of the production results in the workshop forum. Assessments, input and positive criticism emerged. At the end of the workshop, a follow-up plan was arranged by the activists and the people on the application of DMAM for the Timbulharjo version. The resulting agreement was the creation of off-air activities in the form of a *macapat* (Javanese

song) competition on the theme of disaster risk reduction, with special reference to earthquake disaster reduction, and playing the result of the Macapat Competition on Angkringan Community Radio in its on-air program.

Lintas Merapi FM Community Radio

On the second day of the workshop, Lintas Merapi Community Radio activists and the people made audio material scripts on the disaster prevention in a Merapi version. Lintas Merapi Community Radio became a unique place for the DMAM by JICA Hyogo/DRLC and AMARC Japan Working Group and because they contained no material suited to volcano eruptions. Having completed the script, the making of audio material for Merapi eruption prevention continued. The activists and people worked together to produce Merapi Volcano eruption audio materials such as comic chats and songs talking about early warnings. The results of the production were then presented in a forum to gain public responses. Various input emerged, such as unclear pronunciation, the background sound volume was higher than the narrator's voice, and the use of local dialects.



The last series of the workshop was the arrangement of follow-up action to produce audio material in for the Merapi version after consulting with the Institute of Volcano Technology Development and Research (BPPTK). It was also arranged to have a public program on the local community radio either on-air or off-air by the end of 2009.

The last agreement at the workshop was to continue DMAM dissemination and propagation at each radio station based on the two core activities (i.e. on air and off air.)

How to Utilize DMAM for Community Based Disaster Management Performing On Air and Off-Air Activities (After Community Workshop)

Angkringan Community Radio

Traditional Javanese poetry recitation contest

One of disaster risk reduction activities which were implemented by Angkringan Community Radio was the holding of a traditional Javanese poetry recitation contest. Poetry recitation is an integral part of everyday life of the village community, and so having a poetry recitation program on the radio was essential. Program content, including poems that would raise the village people's awareness on disaster risk reduction, was created in the DMAM workshop.

For the poetry recitation contest, a village poetry recitation teacher was invited to create a poem that contained the essence of disaster prevention. 40 men and women dressed in traditional Javanese costumes recited the poem. The contest to find who was best began. The participants, including those from the local village government office, numbered about 60 altogether. The event began at 9:30am and after a lunchtime break the awards presentation ceremony was held. The event finished at 4:00pm. Although the event was held in hot, humid weather, the village people were delighted to have the poetry recitation event revived after a lapse of 5 years. Having the essence of disaster prevention included in the village's culture of traditional poetry recitation will make sure it will be passed on through generations.

Angkringan Community Radio is constantly broadcasting the top 3 men and women's poems.



How to Utilize DMAM for Community Based Disaster Management Performing On-Air Activities (After Community Workshop)

Program activities which were aired either live or recorded. The on-air programs played DMAM, performed a DMAM quiz and talk show which uncovered disaster materials. The steps of arranging this program were based on the findings of both pre-workshop and workshop activities.

Lintas Merapi FM Community Radio

Talk Show with BPPTK

Lintas Merapi Community Radio held an open discussion with the public on disaster potential in Deles, Kemalang Klaten featuring the Division of Volcano Technology Development and Research (BPPTK) and Social Department of Klaten Regency. Some questions emerged at the talk show, such as who was responsible for determining Merapi's status, and who was responsible for determining when the people should evacuate to a safe place. Furthermore, at the talk show there also emerged criticism towards the Merapi eruption response simulation. The talk show has become a bridge to connect the people and the agency that deals with Merapi volcano eruptions.

Quiz program

The quiz was carried out to measure the understanding of the people about the possibility of a Merapi eruption. Besides measuring their understanding, it was also feedback on the audio material made. The quiz presented questions such as, "What is EWS (Early Warning System) ?," "How far is the safe distance to avoid an eruption?," "What is BPPTK?," and various questions related to a Merapi eruption.

Playing DMAM in the Lintas Merapi version

To follow up on the workshop recommendation, Lintas Merapi Community Radio activists made a Lintasi Merapi version of DMAM. The process passed with consultation with BPPTK as the policy-maker related to the volcano situation in Merapi.



How to Utilize DMAM for Community Based Disaster Management Performing Off-Air Activities (After Community Workshop)

Off-air activities were carried out by the community radio management and community members in the field and were indirectly connected with on-air activities. The activities were in the form of a painting and drawing competition, a culture competition, a disaster simulation, and other activities involving the people. Off-air activities were also a way to strengthen the relationship between the community radio station and the people in the community.

Lintas Merapi FM Community Radio

The Formation of KANCING (Children Love Environment Group)

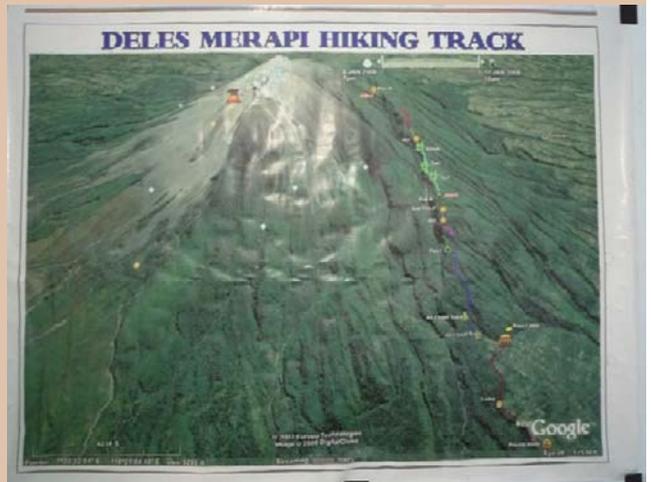
Children are a fragile group in every disaster. However, this group's needs are sometime neglected when tackling a disaster. Having learnt from community radio FMYY in Japan, Lintas Merapi Community Radio organized a children's group named KANCING (Children Love Environment Group).

KANCING and the activists conducted activities dealing with an introduction to disaster and disaster risk reduction in Merapi. Some activities carried out were:



PPGD (First aid for emergency situation) Training

Training was for children from elementary schools in the Merapi area. They were introduced to the conditions of Merapi when an eruption happens and how to face it. The children were very enthusiastic. They had fun while doing disaster simulation. They helped their friends who became victims of the disaster, and then wore masks and went to simulated refugee camps.



How to Utilize DMAM for Community Based Disaster Management Performing Off-Air Activities (After Community Workshop)

Lintas Merapi FM Community Radio

PPGD Exhibition

The results of PPGD training were performed beautifully at the “Pasag Merapi Program,” “Syawalan Pasag Merapi,” which was held and participated in by the people of Merapi in four regencies, Sleman, Klaten, Magelang, and Boyolali. Incidentally, the host of this annual event was Klaten. The event was very merry and different from the usual ones because it had many attractions and entertainment. Furthermore, it also had some exhibition stands belonging to the people who live on the slopes of Merapi and non-government organizations focusing on environmental subjects. They exhibited their excellent products.

KANCING also participated. They presented their PPGD simulation. Led by the head of KANCING, they shouted their cry with great enthusiasm and were welcomed by other children. This was their cry: “Lintas Merapi!” “OK!”, “Tanam Pohon (Growing Trees)!”, “OK!”, “Merusak Lingkungan (Damaging Environment)!”, “Ya enggak lah yow (No)!!”

Children’s Painting Competition on “Merapi Volcano Threat”

To develop children's love of Merapi as well as to build their awareness of potential disasters, Lintas Merapi Community Radio held a drawing competition “Merapi di Mataku.” Children gathered at the studio in the afternoon after school activities. KANCIL led the shout on the environment theme. The number of participants was far beyond expectations and was so many that they had to use the drawing tools in turn because the supply was limited. They were asked to draw Merapi when it is active. They drew what they felt. Having done with the painting, they were asked to describe the picture in front of their friends. “This is Merapi volcano, this is lava, this is ash going in a west direction, this ash goes to Tegalmulyo (east), these birds are scared, this forest is burnt, this lava goes to Gendol River, and a little goes to Woro river.” There was laughing and joking when telling their stories. Their growing awareness of potential volcano disasters made them feel at ease and erased their fears.



How to Utilize DMAM for Community Based Disaster Management Performing Off-Air Activities (After Community Workshop)

Lintas Merapi FM Community Radio

Playing a children's movie on the theme of the environment

The results of the drawing competition were announced at the children's school. This was done to create synergy between activities at school and those at Lintas Merapi Community Radio. After the drawing, the children read comics and watched movies together. The theme of the movie was disaster and environment.



DMAM is the trigger of Community Based Disaster Management

The DMAM workshop at Lintas Merapi Community Radio station triggered the setting up of a monthly disaster prevention study program for over 40 children. The following is what happened on one day the program was held.

The children assembled in the assembly hall next to the radio station and began reading comic books about volcanic eruptions. Next, the children made a short presentation about Mt. Merapi (volcano) using the pictures they had drawn. After that, they moved outside and practiced rescue drills to be carried out when a disaster occurs. Everything was conducted promptly and efficiently. After all the activities were completed, a review was conducted which was followed by everyone having a meal together.

Other activities were held at Lintas Merapi Community Radio. These included learning about the village by taking walks through it, planting trees, etc. for protection against volcanic ash, conducting disaster prevention classes for parents and children, as well as activities to pass on knowledge and information about disaster prevention and the environment were carried out. Lecturers from local environmental NGOs were invited to participate. Since it was not desirable to depend on NGOs for funds for these activities, the community collected funds by selling T-shirts and bamboo craftwork, etc.

Of course, radio programs where the focus of these activities with children also involved in creating them. These were not just announcements about workshops. They let each household know about what activities were conducted at each workshop, and from this about 100 SMS responses were received.

These community disaster prevention and management activities were initiated as a result of the DMAM workshop.

Community Workshop on Utilizing DMAM Inspires the Community

Shortly after the 7.6-magnitude earthquake that shook Padang at the end of September 2009, people who were stressed due to the deaths of their relatives and friends, as well as damage to their houses, became more anxious because there was a rumor that an even bigger earthquake would occur. The panic got more intense because the information and communications system had broken down. The public could not get satisfactory or reliable information. Often what they got were just rumors that worsened the situation. Rumors about a greater earthquake that could split a region often appeared and made the disaster victims more psychologically insecure.

In such a situation, there is a need for information and communications technology that can readily be used to disseminate information from the outside to the communities and vice versa. In this respect, community media, like community radio stations situated close to the disaster zone, can be optimized as an information and communication channel. In Indonesia, there are 600 community radio stations spread throughout the different provinces. All parties, especially local governments, can make use of them as the forefront for their community-based information and communications system.

Without much publicity, community radios in disaster-affected areas have actually played an important role in both the emergency response and rehabilitation periods. In early September, a 7.4-magnitude earthquake occurred in Tasikmalaya, West Java. The Community Radio Network of West Java promptly coordinated with its members to check the damage and seek help to make them able to function as community information and communication channels. The earthquake in West Sumatra was also responded to quickly by community radio stations in the region, like Stallon FM and Taratak Kuban Payakumbuh in West Sumatra. These two community radio stations were not severely damaged. With their available transmitting power, they promptly relayed broadcasts of television and satellite radio programs so that

people could get adequate information about the earthquake that hit their areas. The Community Radio Network of West Sumatra directly coordinated in the determination of which community radio stations were able to be optimized to support the emergency response. They got together in the Agam Regency, Lubukbasung, to designate roles in assisting the earthquake victims both as information and communication channels and by distributing logistical aid.

Much earlier, community radio stations in South Sulawesi also played a role in dealing with a flood disaster that struck 4 regencies of this province, namely Jeneponto Regency, Bantaeng Regency, Bulukumba Regency, and Sinjai Regency. At that time, two community radio stations in two of these four regencies, Bantaeng and Bulukumba, transmitted information to several other community radio stations scattered in several areas outside the flood zone, including Makassar, Takalar, Bone, Pangkep, Pare, Tana Toraja, Mamuju, and Palopo. Information was obtained through various means, for example, through live reports, SMS, websites, and quotes from the media. The same thing happened when the earthquake struck Yogyakarta and Klaten on May 27, 2006, community radio stations also played an important role in providing information to communities. Community Radio Pamor, for example, broadcast information about the government-promised subsidy to finance the reconstruction of houses. Menara Siar Community Radio in Terong, Pathuk gave information about the aid given to the communities. This community radio in particular honored the women who had become the backbone of logistic aid during the post-disaster rehabilitation period.

The role of community radio does not stop at emergency response and rehabilitation. In safe times, it is important that the role of community radio be a channel for disaster mitigation education for the communities. It is very important that this process is done in disaster-prone areas in various regions of Indonesia. Therefore, when a disaster occurs, people will be better

prepared to deal with it. Realizing the importance of disaster mitigation education for the community, JICA Hyogo/Disaster Reduction Learning Center (DRLC), Combine Resource Institution, and AMARC JAPAN Working Group held a workshop entitled "Community Based Disaster Management Utilizing Community Radio" on 2-5 August 2009, in two community radio stations around Yogyakarta, namely Radio Lintas Merapi on volcano disaster and Radio Angkringan on earthquakes and floods.

Prior to this, JICA Hyogo/DRLC and AMARC Japan Working Group had produced audio materials containing practical guidelines in dealing with disasters, like earthquakes, tsunami, landslides and floods. These two community radio stations were asked to listen to the audio product and then later adapt it to the needs of the local communities. This workshop was very important to both stations because it was the first time they could hold a special gathering with residents to discuss the roles of community radio in disaster education for the community. Sukiman, leader of Lintas Merapi Community Radio, said that, although the audio materials produced by JICA Hyogo/DLRC and AMARC Japan Working Group does not include volcano disasters, it has inspired them to produce the same thing. They are very eager to make an audio product concerning the signs of volcanic eruption. In order to get correct information, volcanologists will be consulted for the product. Eventually such information will be packaged using the local language and a style that the people can understand.

In this workshop the community radio personnel and the people also developed some new ideas. For example, the *macapatan* (traditional singing) group that has a special program on Radio Angkringan was encouraged to compose songs talking about early warnings for dealing with any earthquake. In the workshop, local idioms became the primary choice in stirring up public awareness of disaster mitigation. This



workshop also encouraged community radio to expand its roles not only in radio broadcasting but also in off-air activities like children's painting contests with the theme of disaster, workshops in schools, etc. Unexpectedly, a community radio from Central Kalimantan, supported by the CARE organization, also attended this workshop. Central Kalimantan is susceptible to disasters related to forest fires, so they joined the workshop to develop an audio product concerning a warning system for the communities there, informing them of the signs of forest fires and many other things they have to do to prepare to cope with them.

Considering that most regions in Indonesia are vulnerable to various forms of natural disasters, such as earthquakes, volcanic eruptions, landslides, hurricanes, floods, tsunamis, etc., the model that has been developed in this workshop should be applied in all community radio stations in Indonesia. Hence, community radio can be the spearhead of disaster reduction education through both on-air and off-air programs. Mainstream media cannot continuously run programs to the public. The closeness of a community radio station to its supporting communities can provide the power to play a role in reducing the risks of disasters in the future.

Sadness, suffering and bitterness often make a community shorten its memory of an event. The people want to forget their beloved families and relatives who died in a disaster. Such a struggle is certainly very understandable in their effort to survive the past and go on to the future. But the process of forgetting is also critical, because it can cause them to become unaware of a disaster that someday may strike again. This is where a community radio station can contribute in most a delicate and elegant way to notify them that past disasters shall not be forgotten, but will be accepted, learned and remembered, so that the same misfortune will not happen again in the future.

(AMARC Asia Pacific e-newsletter, Dec 2009)

Chapter 5

About Natural Disasters

Disaster is an event or a series of events caused by both natural and/or unnatural factors including human-made ones that threaten and disrupt people's lives and livelihoods, causing human casualties, environment damage, property loss and psychological impacts.

Natural Disaster is a tragic event or a series of tragic events caused by natural occurrences like earthquakes, tsunami, volcano eruptions, drought, floods, tornadoes and landslides.

Non Natural Disaster is any disaster caused by an unnatural event or a series of unnatural events like technological failure, modernization failure, epidemics and plague.

Social Disaster is any disaster caused by an event or a series of events triggered by humans activities like conflicts between social groups and terrorist attacks.

Source: Law of the Republic of Indonesia No. 24/ 2007 on Disaster Management.

The United Kingdom-based charity Oxfam has stated that the number of people hit by climate-related disasters is expected to rise by about 50%, to reach 375 million a year by 2015.

Earthquakes

An earthquake is the result of a sudden and often violent release of energy from the Earth's crust releasing seismic waves. Earthquakes are sometimes called tremors or temblors. The outward signs of an earthquake are the shaking and sometimes displacement of the ground. The intensity may vary from not being felt to uncontrollable shaking, resulting in the destruction of major structures, landslides, etc. If a major earthquake occurs under the ocean it can cause a tsunami.

Causes

Earthquakes are mostly caused by the movement of geological faults and continental plates. They can also be caused by volcanic activity, landslides, nuclear experiments, mining and other such underground activities or explosions. The point within the earth's crust where the earthquake originates is called its focus or hypocenter. The epicenter is the point at ground level directly above the hypocenter.

Where do earthquakes happen?

Although most earthquakes occur along or near plate boundaries (faults), they can occur anywhere in the world.

90% of the world's earthquakes and 80% of the largest earthquakes occur in the earthquake prone Pacific Ring of Fire (east coasts of South, Central and North America, Japan, China, Taiwan, Southeast Asia, etc.). Earthquakes are also common in the Mediterranean and Arab countries as well as China.

Effects

- **Ground shaking and distortion:** When an earthquake occurs the ground will shake. The tremor may be so light it cannot be felt by humans. These are very common. People may feel a light shake in the ground or building they are in during a mild earthquake. Usually there is no serious damage. It is almost impossible to stand and a person can be thrown about inside a building in a major earthquake. Brick and weak

buildings will collapse, even strong reinforced concrete buildings and structures may be seriously damaged.

Distortions, cracks and fissures in the ground surface may appear.

- **Landslides and avalanches:** When a major earthquake happens landslides and avalanches may occur.

- **Fires:** Fires often break out, due to damage to electrical power or gas systems and sometimes where chemicals are stored. These can be the cause of more deaths than the earthquake itself. Even in modern cities like Kobe, enormous damage was caused by fire resulting from the Hanshin-Awaji Earthquake.

- **Soil liquefaction:** When an earthquake occurs liquid sometimes seeps up from underground causing the surface of reclaimed land, man-made islands, etc. to become a sea of mud as was seen on Port Island, Kobe, in the Hanshin-Awaji Earthquake (1995) and on reclaimed land in other earthquakes in Japan.

- **Floods:** When an earthquake happens riverbanks, dams, etc. may be destroyed and landslides may divert rivers or create natural dams which can cause floods. Floods may also result from tsunami.

- **Tsunami:** When a large earthquake happens in the ocean there is the possibility of a tsunami occurring. (see Tsunami)

Warnings and precautions

Since earthquakes happen suddenly it is very difficult to predict them. However, people living in earthquake prone regions should expect them to happen at any time and be prepared for them.

At present predictions by scientists are still very



general, but they do serve to encourage earthquake disaster management policymaking at governmental and local levels.

Recently, Japan has introduced a P-wave warning system. When an earthquake occurs it sends P-waves through the earth at a speed of 6~7km a second, these waves are detected and passed on through a system that warns that tremors are expected in seconds. However, this system is not yet widely in use and has been found to be faulty at times.

Minor earthquakes or earthquake activity may be a prelude to a major earthquake. When a relatively large earthquake occurs, it may be followed by an even larger one. Most major earthquakes are followed by aftershocks, some of which can cause considerable damage to already weakened structures.

Governmental and local measures, both hard and soft, for earthquake disaster mitigation and management are a prerequisite to cope with earthquakes.

Tsunami



A tsunami is a wave or series of waves that can vary in size and force. Most tsunami go unnoticed, but some have huge destructive

force. An example of such a tsunami is the Indian Ocean tsunami that occurred on Dec. 26, 2004 which is reported to have caused the death of over 300,000 people and widespread damage over vast regions on both sides of the Indian Ocean. There are basically two types of tsunami; teletsunami which can cross vast oceans, and local tsunami. About 80% of all tsunami occur in the Pacific Ocean area.

Causes of tsunami

Most tsunami are triggered by earthquakes or plate movements under the ocean. Tsunami can occur in major oceans, smaller seas and even in large lakes.

There is another type of tsunami which is caused by tropical cyclones that can create 'meteotsunami' (or storm surge) which can cause tides to rise many meters above normal tide levels. Such a meteotsunami hit Burma (Myanmar) in May 2008. Though metrotsunami are like tsunami are not real tsunami.

Some characteristics of tsunami

Length: (the length of a wave from crest to crest): A normal wind wave has an average wavelength of approximately 100m, a tsunami

can have a wavelength of approximately 200km, but this decreases to about 12km when it reaches shallow waters.

Height: A normal wave has an average height of approximately 2m. A tsunami wave can be as high as 30m (Okushiri, Hokkaido, Japan). Often ships on deep sea oceans don't notice tsunami. But as a tsunami approaches shallow waters its height increases dramatically as in the case of Okushiri. Since tsunamis have a very long wavelength, it may take minutes before the peak of the tsunami's height is reached.

The rise or height of smaller tsunami are often not noticed because the wave does not break, often a gradual or even a sudden rise in water level is seen. However, with major tsunami a wave crest may be seen in the distance as it approaches.

Speed: A tsunami when crossing an ocean can travel at a speed of 800kph; as it approaches land and shallow waters, its speed drops to about 80kph.

Multiple waves: Large tsunami may contain multiple waves and the first may not be the highest.

Drawback: A drawback is when the sea withdraws dramatically before the oncoming tsunami wave. Understanding this phenomenon has helped people to act in time to reach high land or a safe place before the tsunami arrives. On the other hand, people who do not understand this are sometimes curious and go to the beachside and sometimes out into where the sea has receded, resulting in them being submerged by the oncoming tsunami. In the Indian Ocean tsunami, while a drawback was experienced in parts of India and Thailand, it was not reported

on African coasts or any other eastern coast.

If a drawback is observed, people should act as quickly as possible to get to high ground or onto the higher floors of a strong building.

Warnings and precautions

Hesitation to act quickly can cause the loss of life.

If a person near the seaside feels even a mild earthquake, he/she should not hesitate to immediately evacuate to higher ground or some distance from the shore.

Since the source of a tsunami may be thousands of kilometers from the coast, it is difficult for local people to be aware of an approaching a tsunami unless there is a warning system.

Attention should be paid to any abnormal phenomena such as drawbacks, or a long wave crest in the distance and act quickly.

Many regions that are at high risk use tsunami warning systems. People should familiarize themselves with them.

Japan has built seawalls (up to 4.5m high) and floodgates in many coastline areas.

It was found that the village of Naluvendapathy in India's Tamil Nadu region suffered only minimal damage and few deaths from the Indian Ocean tsunami. It is said that the forest of coconut trees and mangroves planted along the coast absorbed the energy of the tsunami.

Floods

A flood is an overflow or accumulation of water that submerges land. Floods usually occur along or near rivers, lakes, and the seaside.

Floods happen when rivers overflow or when riverbanks break, when water levels rise due to heavy rain, or are the result of tsunami or abnormal high tides.

Some floods are seasonal and predictable and even good for the land, however, many floods are sudden and cause enormous damage and huge loss of life (2.5~3.7 million deaths in the 1931 China floods).

Types of floods

River floods: (a) **Slow floods** occur when rivers overflow because they cannot cope with the rise in the volume of water from continued rainfall or sudden snow melting. They include flooding caused by monsoons, hurricanes, tropical storms, etc. Blockage due to landslides, debris, etc. is also another cause. (b) **Fast floods** or flash floods are caused by unusually intense and heavy rainfall in thunderstorms, typhoons, etc. They can also be caused by a sudden release of a large volume of water upstream.

Estuary floods: These floods are usually caused by a combination of sea tidal surges and high water level in the river, or by either.

Coastal floods: These are caused by sea storms, tsunami, hurricanes (typhoons) etc. and a rise in sea levels or tides in low-level islands and coastal areas (Venice, Maldives, etc.).

Poor drainage area floods: Floods occur in these areas when the soil cannot absorb or there is no escape route for water poured into it from rainfall or other sources.

Other floods: Floods caused by dam breakage, landside, earthquake, volcano eruption, etc. Floods caused by continuous storms over the same area.

Effects:

Main effects:

- Floods can damage or destroy bridges, buildings, roadways, canals, riverbanks, sewer systems, etc.
- People and livestock die due to drowning.
- Floods can also lead to epidemics and diseases.
- Crops can be damaged or destroyed.

Secondary effects:

- Water supplies can be contaminated and drinking water become scarce.
- Because of contaminated water and other unhygienic conditions diseases often break out.
- Long and short-term food supply shortage.

Long term effects:

Depending on the extent of the flood, economic problems will occur due a decline in tourism, rebuilding costs, housing, demands on the social welfare system, price increases caused by food and other shortages, etc.

Warnings and precautions

Many slow floods can be predicted in time to evacuate the endangered area, others like flash

floods give very little forewarning. Monsoons, protracted rainfall, hurricanes (typhoons) are some indicators of possible flooding. All of these can be predicted with modern weather forecasting technology and that is why paying attention to weather forecasts is important. Fast floods are more difficult to predict because many are caused by local intense cloudbursts often upstream unknown to inhabitants in the endangered areas downstream. Cloudbursts or

local thunderstorms are difficult to forecast. However, large dark heavy rain clouds in the hillside can be a warning sign, especially in areas where the mountainside is steep and the rivers are narrow. Most floods caused by debris blocking rivers upstream can be predicted and prevented if observation and action are undertaken. Areas along the coast and river estuaries need to pay attention to abnormal high tides, sea storms and tsunami warnings.

Tropical Cyclones (Hurricanes / Typhoons)

A tropical cyclone (hurricane/typhoon) is a tropical storm with sustained winds of at least 33 meters per second which rotate counter-clockwise. It also contains an enormous amount of moisture which can cause intense heavy rainfall.

Depending on the region different names are used to describe a strong 'tropical cyclone'

Hurricane: North Atlantic Ocean, Northern Pacific Ocean (east of the dateline), South Pacific Ocean (east of 160E)

Typhoon: Northwest Pacific Ocean (west of the dateline)

Severe Tropical Cyclone: Southwest Pacific Ocean (west of 160E), Southeast Indian Ocean (east of 90E)

Severe Cyclonic Storm: North Indian Ocean

Tropical Cyclone: Southwest Indian Ocean

Where and when

Tropical cyclones (typhoons/hurricanes) are caused by a large difference in air and sea temperatures which occurs especially in the late summer months.

Almost one-third of the world's tropical cyclones (typhoons) are formed in the Western Pacific doldrums. Typhoons are formed throughout the year but usually peak between August and October. May is the least active, September the most active. The Western Pacific Basin is also the source of the world's most intense storms. The Atlantic hurricane season basically corresponds to the typhoon season.

Typhoon paths

Straight: These generally follow a westward path and affect the Philippines, southern China, Taiwan and Vietnam

Recurving: These follow a westward path then turn north and affect China, Taiwan, Japan and Korea

Northward: These turn northward almost from their point of origin and affect some Pacific islands

Effects

- While still at sea, tropical cyclones cause large waves, heavy rain and high winds disrupting sea transportation and often causing shipwrecking.

- When they reach land, they can cause a rise in sea level (storm surge), and high waves which can result in flooding in low-level coastal regions and is the cause of 90% of tropical cyclone deaths.

- On land, cyclones can seriously damage and destroy buildings, structures, or anything that is exposed to their severe winds. Flying debris can become deadly projectiles.

- Tornadoes can also be formed as a result of cyclones.

- Because these storms occur in or near tropical areas in summer, the risk of the spread of diseases is high, especially in overcrowded evacuation centers and in the unhygienic conditions that remain in the wake of such disasters.

- The damage caused by the storms often makes relief and recovery work difficult, and in some cases the economic damage is astronomical (Hurricane Katarina). In many Pacific regions, these storms hit just before or during the rice harvesting season and often wipe out a whole season's crop.

Warnings and precautions

Tropical cyclones (hurricanes/typhoons) can be

strength and course and therefore need continuous observation. Since the path of a tropical cyclone can be generally predicted, there is time prepare as much as possible to reduce the risk of disaster. However, if they are not predicted early enough, they can strike quickly and

violently with gale-force winds and torrential rain, and in coastal areas they can cause flooding due to sea surge and high waves thus giving local people no chance to evacuate or prepare.

Volcano Eruptions

A volcano is an opening in the earth's surface from which allows magma, cold and hot ash and gasses to escape. A volcanic eruption occurs when there is an explosion of a large volume of hot magma, ash, rock debris, etc. from the mouth of the volcano.

Volcanoes are often found in the same areas that earthquakes regularly occur such as the Pacific Rim of Fire (so called because so many volcanoes are located along the Pacific Rim).

Types of volcanoes

This classification is used to describe the frequency of eruptions of a volcano. However, volcanologists believe that this method is not very accurate because some volcanoes have a lifespan of anywhere between a few months to a few million years. It is quite dangerous to think that a dormant or extinct volcano will not erupt.

Active: Volcanoes are considered active if they erupt regularly, or if they have erupted within historic times. However, recorded history varies from region to region; in the Mediterranean and China it is over 3,000 years but in Hawaii and New Zealand it is only about 200 years. However, scientists consider a volcano active if it is likely to erupt if there are signs of unusual earthquake activity, gas emissions, etc.

Extinct: Extinct volcanoes are those scientists consider unlikely to erupt because there is no lava within it. There are some volcanoes like the Yellowstone Caldera that have not erupted for more than 500,000 years but scientists still consider active because there is geothermal ground uplift activity.

Dormant: It is difficult to distinguish a dormant (sleeping) volcano from an extinct or active volcano. Most dormant volcanoes are those which have no record of eruption, but cannot be written off as extinct.

Effects

- Since there are many kinds of volcanic eruptions, there are many different effects, some direct others indirect.

- When an eruption occurs, debris (basalt, etc.) can be thrown over a wide area and act like non-explosive missiles and hot lava can flow down volcano slopes sometimes covering and burning villages and towns.

- Lava is super-hot molten rock which can flow slowly or quickly when there is an eruption. It can destroy anything in its path.

- Ash, because it is lighter rises higher into the air or stratosphere and travels over a wide area and when it falls can cause serious crop damage and pollution. In areas near the volcano, ash can accumulate causing considerable damage to the environment. If mixed with water (rain, etc.) the ash can become a concrete-like mixture. Large amounts of ash may cause roofs, etc. to collapse.

- Volcanoes also emit many kinds of dangerous gasses; carbon dioxide, sulfur dioxide, hydrogen sulfide, etc. If these chemicals are mixed with rain they can create what is called acid rain, which also damages crops.

Warnings and precautions

Considerable advances have been made in predicting volcanic eruptions. Earth movements (volcano seismology), gas emissions, thermal monitoring, ground deformation, hydrology, etc. are used to predict volcanic eruptions.

However not all volcanoes are monitored adequately and many developing countries do not have the means to predict eruptions. Because of the nature and complexity of volcanoes, long-term predictions are usually general.

Generally speaking, the greatest damage done by volcano eruptions is in the immediate area around the erupting volcano. It would be sensible not to build villages, towns, cities, or farms

in the area, but since many volcanoes have not erupted for hundreds or thousands of years, people think they have become dormant or inactive and build settlements around them. Although an eruption can occur very suddenly

and violently, often there are signs of irregular activity beforehand such as abnormal small eruptions, emission of gas, hydrothermal activity, rumbling sounds, etc. If these are noticed, early evacuation or preparation for evacuation

Tornadoes

A tornado is a violent, dangerous rotating column of air. It is visible in the form of a spiraling narrow funnel connecting a cumulonimbus cloud or the base of cumulus cloud with the surface of the earth. Tornadoes have a wind speed of 64~177 kph, are about 75 m across and travel a few kilometers before they dissipate. The worst tornadoes can have a wind speed of more than 480 kph and travel more than 100 km.

Effects

Tornadoes often affect a rather limited area during a very short time. Large tornadoes are one of the most intensively destructive natural climatic forces and are extremely dangerous. They can uproot most small and light structures, vehicles of all kinds and sizes and large trees.

Waterspouts and landspouts are less destructive because of their size so the damage is relatively smaller.

Warnings and precautions

Most advanced countries have radar systems that can detect large tornadoes, but they are still difficult to predict. Waterspouts and landspouts are even more difficult to predict because they are very local, they form and dissipate suddenly and of a relatively small size. Some large tornadoes can be seen coming, but there is often only enough time to evacuate to a safe place. Because of their destructive force, light buildings, wooden houses etc. are often torn to pieces, thrown into the air and scattered over a wide area. This flying debris is also very dangerous and some can even pierce through roofs, etc. As a result it is difficult to find adequate shelter in rural and open-space regions where they often strike.

Landslides / Mudslides

Mudslides (Mudflows): Mudslides are the movement of a large mass of mud (loose soil and water). They can be very fast (up to 80 kph). A mudslide can be comprised of very soft (almost liquid-like) or wet soil, rock, volcanic ash, etc.

Mudslides usually occur on or near hill slopes after heavy or prolonged rainfall, which causes soil or sediment to become soft and erode. Some mudslides can affect a wide area and often travel some distance from their source if assisted by rivers and streams.

Effects

Mudslides can cause loss of life and destroy houses, villages, and farms built on hillsides, at the foot of hills or near riverbanks.

Predictions and precautions

Because most mudslides are the result of heavy

or prolonged rainfall or snow melting and usually occur on hillsides composed of soft soil or loose rock, they can be expected to occur if

these conditions exist. People living in such areas need to be constantly aware of the possible occurrence of mudslides, especially when there is heavy and prolonged rainfall.



Landslides (Landslip): A landslide includes any of the following: rock falls, earth flows, slope failures (collapse of slopes), shallow debris flows, etc.

Landslides occur when the surface of a slope becomes unstable under the following condi-

tions: (a) if they become excessively wet, (b) have lost their vegetation, (c) if there is erosion at the toe of the slope caused by rivers or ocean waves, (d) due to effects of melting snow or glaciers, (e) after earthquakes render the slope structure unstable, (f) liquefaction (g) as a result of earthquakes or volcanic eruptions.

Major landslides can be triggered by earthquakes, as was seen in Sichuan, China in 2008. Human activities such as deforestation (logging), cultivation (farming), construction

and vibrations from blasting, mining and machinery may cause landslides on fragile slopes. The construction roads etc. which alters the shape of a slope can induce landslides. Changing the eco-system is another possible cause.

Wildfires

Wildfires are uncontrollable fires which burn in hills, and other wildland areas. They usually occur during hot, dry seasons and are started by lightning and drought, though some are caused by human negligence or by arson.

Effects

Fires can threaten and destroy farmland, housing, and human life especially in rural areas. They can also seriously damage the wildlife environment in the area and can continue to burn for days.

Predictions and precautions

Prolonged and severe droughts create an ideal environment for wildfires. People should expect wildfires to occur in such climatic conditions and as such be ready for them.

Local authorities may need to issue a temporary ban on the use of open fires in such situations, as is the case in Australia when there is a threat of wildfires starting.

Hikers and campers, etc. need to be careful when using fires. Casually tossing a lit cigarette butt away near a wildlife or forest area can also cause a wildfire.

Epidemics / Pandemics / Diseases

An **epidemic** is an outbreak of an infectious disease that spreads quickly among many people. A **pandemic** is an epidemic that spreads globally. There have been many epidemics throughout history; the most infamous is probably the Black Death which spread throughout Europe between 1348 and 1350 and is estimated to have killed between 30% and 60% of the population of Europe.

There have been a number of serious pandemics in the last 100 years: the 1918 Spanish Flu (est. 50 million deaths worldwide), the 1957~8 Asian Flu (est. 1 million deaths), AIDS beginning in 1959, the 1968~9 Hong Kong Flu, SARS in 2002~3, and the recent H1N1 Influenza in 2009. Other serious diseases such as malaria kill an estimated 1.5 million people a year.

Precautions

Good public and personal hygiene can help pre-

vent the spread of many contagious diseases, therefore educating people about the importance of public and private hygiene is very important. Educating the public about the disease, how it spreads, how to prevent being infected and how to treat it are very important.

Public panic and unnecessary anxiety often occur when an epidemic or pandemic breaks out. To prevent these, the dissemination of accurate and practical information to all members of the community is important.

In serious cases, putting people into quarantine may be necessary.

Cleaning up after disasters can be dangerous!

Cleaning up after disasters can be dangerous to workers and volunteers.

Possible dangers are:

(1) collapsing buildings, etc, (2) injury by sharp objects, electrical cables and other hazardous

materials, (3) biological hazards – contamination through blood, human fluids, polluted water, unhygienic conditions, (4) exposure to heat and cold, (5) overwork and strain causing musculoskeletal problems, (6) stress (physical and mental), (7) trauma, etc.

Workers and volunteers need to be aware of the possible dangers and be prepared, and disaster relief managers need to ensure that their workers and volunteers are aware of these dangers and are provided, if possible, with hard hats, heavy work gloves, boots with steel toes and soles, and other protective wear.

Disasters in Indonesia

Various disasters have been close to Indonesian people's lives. Almost every year big disasters happen. In the last few years disaster incidents seemed endless: earthquake in Papua (2004), earthquake and tsunami in Aceh and North Sumatra (2004), earthquake in Nias (2007), eruption of Mount Merapi (2006), earthquake and tsunami in West Java (2006), flash flood in South Sulawesi (2006), earthquake in West Sumatra (2007), earthquake and tsunami in Mentawai (2007) and the latest earthquakes in West Java and West Sumatra (2009), not to mention other various natural occurrences in other parts of Indonesia, which have brought adverse impacts to people's lives. During the period of 2006 – 2007, for example, 840 disasters had occurred. The death toll reached about 10,000 and more than 4 million people were directly affected by the disasters.

Seeing the prevailing situation and condition, the Indonesian government and communities have begun to make an effort to mitigate the impacts of disaster in a better way. In the last few years, the paradigm of disaster management has changed from the previously reactive and responsive actions following disaster to actions of earlier preparedness before disaster. This means preventive and mitigating actions have begun to be taken seriously. At present the paradigm of disaster management refers to the measures taken to reduce disaster risks, done before, during and after any occurrence of a disaster.

In any occurrence of disaster, certainly the main priority is to save human lives. The Law of the Republic of Indonesia No. 24/2007 on Disaster Management clarifies in Article 26 the rights of the people who suffer from a disaster. People, especially those prone to disaster, have the right to receive social protection and security. They have the right to have basic needs fulfilled. In particular, in disasters caused by construction failure, victims have the right to receive compensation. Some measures of disaster management have been taken in order to fulfill these basic rights.

Chapter 6
The Role of Community Radio
in Disaster Management Efforts
(Case Studies)

Padang Sago Community Radio

The earthquake that shook West Sumatra on September 30, 2009 caused countless loss of lives and property. The earthquake brought deep sorrow and trauma to the people. Yet, the disaster awakened community radio activists to develop a community-based Disaster Information System. Padang Sago Community Radio is one of the community radio stations in Padang Pariaman Regency. It was established a week following the earthquake. Formerly, the radio was an emergency radio established by Combine Resource Institution (CRI). Because of the high enthusiasm and participation of the people in running the radio, CRI gave them the radio equipment.

Why did community radios in Padang Pariaman Regency develop a Disaster Information System following the earthquake? What did they do? What strategies did they apply to develop the system? One problem that the people faced during the emergency response phase was the low performance of governments in handling victims and distributing aid. The aid distribution had to pass through a long bureaucratic chain. As a result, the victims' needs could not be quickly tackled. Such a condition was worsened by the government's inaccurate data. Information about the number of victims, which areas were hit by the disaster, victims' needs, etc., was not reliable.

Considering this condition, activists in community radio in the regency and the city of Padang Pariaman agreed to set up a Community Radio Network working group. Facilitated by CRI, they participated in developing the SAHANA-based disaster management system. There were four community radio stations participating in this activity.

To solve the problem of distance between the radio stations, communication radio technology was used. This technology is cheap because there is no need to pay any costs. Every day, these radio activists exchanged information. The information then was disseminated through their respective radio stations. In addition, community radio stations in the Regency and City of Padang Pariaman mobilized volunteers to collect data, especially from firsthand sources, from people's groups at the level of *Korong* – a residential unit area as large as a *rukun tetangga* (neighborhood). Data collected from them was then used for broadcasting materials. This program was used by donor organizations and the government as a guide for distributing aid; for example, in determining type and quantity of aid, and in improving their data. Through the Disaster Information System, community radio activists in Padang Pariaman developed two-way information and communication activities between the people and the government.

Padang Sago Community Radio itself regularly broadcast advice on how to access aid from these organizations, and how to pass through the transition period safely. It also broadcast information on how to build an earthquake-resistant house, how to cope with health problems following the disaster, and gave information on the general overview of disaster management efforts. To maintain the validity of their data, they reported in accordance with the principles of journalism.

(Sabar Rina, Director of Padang Sago Community Radio, Padang Pariaman)

Suara Pangandaran Community Radio

The disaster caused by the earthquake and tsunami that hit the southern coast of Java, including Pangandaran, on July 17, 2006, roused people's awareness of how important knowledge about the environment, nature and weather is. Suara Pangandaran (Voice of Pangandaran) Community Radio on 107.7 FM appeared as a reliable information source for the surrounding communities. This radio station was easily accessed by the community, especially those staying at the refugee camp.

On-air programs produced by Suara Pangandaran Community Radio were, among others:

1. News programs which covered information about aid distribution, aftershocks and weather conditions for fishermen. To validate the information, the radio made a contact with the Meteorology Station I of the Meteorology and Geophysics Agency in Cilacap. For weather information, fishermen offshore also gave information to the radio. Therefore, a two-way communication between the radio and listeners could be established, making exchange of information possible from both sides.

2. Entertainment Programs

3. A special program for recovery activities, namely Recovery Forum for All. This program discussed the acceleration of post-disaster recovery. Many competent speakers experienced in their fields were presented to directly talk to people who could communicate through SMS or telephone.

Off-air Programs:

1. Education and Information on Disaster

This program also took on the activity of English learning for kids, and was held on the beach. Besides its educational purposes, this activity could also be seen as a tool for healing post-disaster trauma.

2. The radio station also always reported on the latest situation in a rational manner both through on-air and off-air programs. When there was an uncertain rumor, the radio mobilized volunteers to patrol around the neighborhood. A Scooter team, using Vespa motorbikes or *suku nu muter* (Sundanese language, referring to a bike). As a result, the people always felt safe. This activity became quite an effective solution to calm the people down. Slowly, they began to be cautious and critical of the information that circulated among themselves.

3. Data and information services for victims of the disaster

The radio station always took care to communicate the interests of the affected communities, including information about the needs of refugees, and the availability of food and other necessities. This radio also had a team of volunteers to assist the affected communities and to act as motivators and facilitators. For example, they encouraged community members to work together to improve sanitation facilities. The best field facilitators also provided training on trauma healing, especially to children and women, and were assisted by volunteers coordinated by the radio. The radio also planned off-air activities such as World Clean Beach Day on September 19, 2006.

4. Suara Pangandaran Community Radio organized community dialogs and conducted disaster management training in schools.

Radio Menara Siar Pedesaan

When an earthquake with a magnitude of 5.9 on the Richter scale shook Yogyakarta, the entire equipment of Menara Siar Pedesaan Community Radio in Terong Village, Dlingo Sub-district, Bantul Regency, was damaged by a falling wall. At that time, everybody was busy trying to save their own families. But after three days, personnel of the radio station decided that the radio had to resume broadcasting immediately. Fortunately, the transmitter still worked. Therefore, a transmitting antenna using a tape recorder and planks was constructed, and the broadcasting was carried out. Despite the absence of electricity, MSP Community Radio could run its broadcasts after borrowing a generator from a fellow villager. They then realized their radio could play an important role for the people at that time. They could send information faster. Through MSP radio, the residents of Terong Village could make reports to organizations or the government which needed information about the latest condition, and the other way round, it could receive information from the government. MSP radio received aid in the form of broadcasting equipment from Radio News Agency 68-H and Combine Resource Institution for outside studio broadcast activity.

The broadcasting program during the emergency response period totally changed. It broadcast information about the needs of the victims and the distribution of aid to the people. MSP also presented actual information about the latest natural conditions through collaboration with the Meteorology and Geophysics Agency, Sarkolak, at both province and district levels, and many non-government organizations.

MSP radio also took part in activities to collect data and disseminate information about the number of families. This data was used as the database for the reconstruction program funded by the government. The data was collected from several hamlets and about 1,500 houses, and in two days it was found that there were only 300 houses left worth living in. At the beginning, the activity of data collecting encountered problems because there was no clarity about the scale with which the degree of damage could be assessed. Personnel from MSP radio set out to find out accurate information from the government of Bantul Regency. As a result, the radio station could get an information sheet explaining the criteria for a damaged house. The information was then repeatedly broadcast so that every RT (Rokun Terong) neighborhood association could collect the data more accurately. To make the role of the heads RT associations easier and to have agreement on the indicators for damaged houses, the radio gave each RT association head a radio receiver. On the authority of the village head, Sudirman, the radio required them to listen to the radio for 24 hours.

MSP community radio presented not only information but also entertainment like songs, *kethoprak* and *wayangan*, as well as live shows. The *kethoprak* show had a special story. MSP radio, working together with NICO Japan, presented a *kethoprak* show, a combination of Japanese tradition and *Mataram-style* *kethoprak*. This show was part of the trauma-healing program for the people. The role of women seemed to be very helpful for MSP personnel in the process of post-disaster recovery. Many post-disaster aid roles were given to women. After passing through the reconstruction stage and entering the reconciliation stage, the women of Terong Village organized a special activity for mental recovery. It was a mass exercise with prizes like goats, chickens and hundreds of other gifts, attended by approximately 1500 women of Terong.

Angkringan Community Radio

Until the fourth day after the earthquake all information from Angkringan Community Radio halted due to the absence of electricity. Because the studio was damaged the radio personnel could not run any broadcasts. It was worsened by the fact that the radio personnel were also victims of the earthquake. They could not even communicate with one another because they were too busy with their own necessities. On the third day they planned to create an emergency studio at Saryanto's house. This decision was made because the house was near a place used as a shelter. The studio was equipped with any devices they had at hand. Some devices belonged to villagers. At that time the antenna was placed on a tree. Due to lack of equipment, they also borrowed an antenna and cables. The placement of the antenna was far from the emergency studio because there was no available spot in or on the house. The distance between the emergency studio and the transmitter antenna was approximately 30 meters. Even after all devices could be installed, the problem of the absence of electricity remained. But after borrowing a generator from CRI, the radio could run its broadcasts again.

In delivering information, Angkringan Community Radio ran entertainment programs. In the evening many people came to the studio and requested the radio station to play their favorite songs. Other people came to ask the truth about the information spreading among the people. A month after the earthquake, the equipment of the radio was better although it was still in the emergency studio. The radio station had quite a lot of personnel. So, an aid post was set up at the studio, too. It was managed by Angkringan Community Radio and located at the emergency studio where the distribution of the aid became more organized. Aid mostly took the form of craftsmen's tools and money. The aid was immediately distributed to people in need.

Anticipating the lateness of Timbulharjo village government in managing aid distribution, Angkringan radio coordinated with non-government organizations and became busy distributing aid directly to the people. The earthquake disaster indeed depressed the psychological condition of the community. However, Angkringan creatively tried to make the people become not too occupied by the grief. Besides delivering information, Angkringan Community Radio also produced comedy programs to cheer up the residents. During the programs announcers always told typical jokes of Yogyakarta, making the people laugh and feel a little happy. Collaborating with CRI, Angkringan Community Radio held a 'Nonton Bareng' (Watching Together) activity. Using an outdoor screen, people could watch live football matches of the World Cup. For 14 months, activity of Angkringan Community Radio continued to broadcast from its emergency studio for 14 months.

Swara Meulaboh FM Community Radio (RAKAN FM)

Formerly this radio station was called Swara Meulaboh FM (Voice of Meulaboh FM) located at a volunteer post in Johan Pahlawan sub-district, Meulaboh. But four months after its founding, the studio was moved and the name was changed to Rakan FM and stands for *Radio Komunitas Aneuk Nanggroe* (Community Radio of Nanggroe Children). This radio broadcasts on frequency 107.7 Mhz, providing information about the recovery of Aceh. Field reportage was often done and broadcast through radio, both on live and delayed broadcasts. In the beginning of May 2005, the radio broadcast a live report of the Festival of Aceh's Culture which was held by a foreign non-government organization in collaboration with the local government. This event showed local art and traditional performances done by Aceh children from all the refugee shelters in West Aceh. The Rakan crew covered this event on location with a communication device and from their studio. Information from the location of the event was sent through radio communication to broadcasting equipment in the studio, and then was broadcast through the radio. Such a pattern of broadcasting from the field was often done if it happened that the radio was able to transmit live broadcasts.

Enthusiasm of the people (especially the youths) to participate in the radio activities was quite high. It was not surprising some announcers were young; they were university students, high school students and youths from the refugee camps. They were so spirited and optimistic. The presence of this community radio provided these young people with a place to show and express their creativity, which had almost faded after being eaten way by years of conflict. For a very long time, they had no access to communication and information especially through the medium of the radio.

Al-Jumhur Community Radio

Al-Jumhur FM Community Radio was rather different from other community radio stations in Aceh. This radio station focused on programs with an Islamic character. The mission of its broadcast was the proselytizing and education of Islam, such as Koran reciting, religious speech, etc. All songs played were Islamic songs. The location of the studio beside a refugee shelter in Simpang Mamplam made the radio a friend of the displaced people in the shelter. When it broadcast for the first time, it had to be an entertaining and educating medium through religious education. Advice and religious messages were delivered through the radio were quite influential in healing the trauma and awakening the spirit of the people staying in the refugee shelter.

Information about the shelter was often broadcast by the radio personnel, some of whom came from the shelter. However, radio personnel were dominated by students of Dayah Ikhayaul Ullum Al Aziziyah. The name 'Al-Jumhur' itself comes from Arabic, and in English means "shared property". Even today, the radio station that was born during the emergency response following the disaster still runs on frequency 107.8 MHz.

Seha FM Community Radio

Seha FM Community Radio located in the Jantho Sub-district, Aceh Besar, broadcasts on frequency 107.8 Mhz. The word 'Seha' is an abbreviation for '*seunang hatee*' (the literal translation in English is 'delighted heart'). The radio opened space for and facilitated groups of traditional artists of Aceh to preserve and develop all products of the local culture. Once a week this radio had live program that was filled in turns by Koran recitation groups from Jantho City of Aceh Besar Regency. Dalail Akhirat was one of the groups filling the program. This group consisted of men who disseminated Islam religion through enchanting the *dalail* that contained prayers of adoration, religious message/ advice in Arabic.

Besides male Koran recitation groups, female ones also involved in the program. Most of them were refugees who lived in refugee camps in some areas in Jantho at that time. The existence of this radio station was very helpful for displaced people in Jantho, which became the main place for refugees from Pulau Aceh, Meuraxa, Leupung and other areas. This radio facilitated many different art and culture communities like the *Pengajian Dalail Akhirat* group, consisting of men and women (married women). Displaced people were very enthusiastic to listen to Seha FM. Besides entertainment (songs), the radio also relayed programs from Radio News Agency 68-H and the emergency the program "Peuneugah Aceh" from Internews, which contained news and information about the latest conditions in Aceh following the earthquake and tsunami.

Lots of information about the condition of the refugees in the tents were broadcasted by the volunteers in Seha Fm. The news that it reported was also sent to radio stations in Jakarta like KBR 68H and Elshintia, and program of *Peunegah Aceh* that was produced by Internews.

Radio Samudera FM

Samudera FM Community Radio broadcasts on 107.7 MHz. A team of reporters actively broadcast field reports from the refugee shelters in the Samudera sub-district, North Aceh. They raised issues that occurred around the refugee shelters. This was what made the relationship between the radio and the community, especially the displaced people, become closer and closer. Their conditions were often broadcast on the radio. This closeness became a factor in building public trust which resulted in the community not hesitating to deliver its aspirations through the radio.

The personnel/announcers of Samudera FM Community Radio were youths from the refugee shelters. They felt could heal their pains caused by the disaster through their involvement in community radio and related activities. In addition, they also wanted to share with other fellow refugees by providing them with amusement and encouragement to continue improving their lives. To heal the pain and trauma of the displaced people, besides entertainment (songs) played on the radio, the radio station also had a spiritual program that contained religious speeches, Aceh's advising *Nazam* (poem), etc. All these programs were aimed at strengthen the spirit of the refugees and to heal their trauma. Activities at the mosque close to the studio location were also often broadcast live by the radio.

Broadcasting multi-language programs for immigrants

On October 23, 2004, an earthquake of magnitude 6.8 struck the Chuetsu region of Niigata Prefecture. Volunteers, composed mainly of people who worked as volunteers after the Hanshin-Awaji Earthquake, provided people in the area who had difficulty understanding Japanese with information in their own language.

Information sent from the region was translated into Chinese, Tagalog, Portuguese, Spanish, English and Korean and was sent back to the area as audio data where it was used by the local community radio station in its broadcasts. In addition, 6,000 radios were collected and a label with the times of broadcasts in different languages was attached to each radio. These were brought to the disaster-struck area and distributed to those in need

of them. Included in broadcast information was the message “Aid from around the country will reach you. Do not worry,” which helped to ease the anxiety of the victims. The region had a community radio station but it did not have multilanguage programs at the time. However, as a result of broadcasting disaster-related information in various languages, multilanguage programs began to be broadcast by the station.



International Solidarity

“Taiwan, Jiji Earthquake Support”

On September 21, 1999, an earthquake of magnitude 7.3 struck the central region of Taiwan. Because Thai, Philippine and Indonesian immigrants lived in the region, a party, composed mainly of Hanshin-Awaji Earthquake volunteers, was sent from Kobe and set up information and consultation services in Thai, Tagalog, Indonesian, English and Japanese for 3 months as emergency support. One year later, in order to pass on important information on the recovery period, we worked together with local NGOs and had information sent from Taiwan translated into various languages and broadcast it on information programs. In addition, a Chinese language program was created to introduce Taiwanese culture and traditions, both of which were broadcast on the Internet. Multilanguage information was also passed on in printed form and on the Internet. Through these activities, residents in the Hanshin-Awaji Earthquake and Jiji Earthquake areas continue to have exchanges today.

Networking with other radio stations

There are limits to what one radio station can do during any of the following phases: pre-disaster prevention, during disaster, and the post-disaster reconstruction period.

For example: What would happen if the building housing the radio station was seriously damaged in a natural disaster? What would happen if radio station staff were victims of the disaster and couldn't carry out their broadcasting work?

In situations like this, the most dependable measure is support from other stations. Because they know about radio stations and how they are run, they can provide various kinds of support necessary for broadcasting.

However, if there is no regular contact or communication among stations, mutual support will not work efficiently when a disaster occurs. If stations meet regularly, co-produce radio programs, and work together, a disaster management network can be built.

Below are examples of how networking can be carried out.

Regular Meetings

Through regular meetings, not only for disaster prevention but also for exchanges about everyday affairs, a mutual exchange of know-how and experience can be created.

Network Programs / Co-produced Programs

A network composed of multiple radio stations can create a timetable for broadcasting the same programs, decide a theme and in turn, broadcast programs each station has created. By choosing disaster prevention as a unifying theme, stations can create programs treating this theme from various points of view. This can lead to an increase in listeners' disaster prevention awareness.

Creating co-produced programs also strengthens the network.

Program Contests

Program contests in which judges chosen from each station judge programs in different categories and present prizes to excellent programs can be held. "Disaster prevention" should be included in the program category list, and every station should broadcast the most excellent program in this category.

Equipment List

Each station should prepare a list of equipment it can lend out, and share this list with other stations to prepare for when a station's equipment is damaged due to a disaster, or for an occasion when equipment breaks down or cannot be used.

By carrying out such regular networking activities, radio stations can reduce disaster damage risk, and become a media with listener-confidence. Such activities can be begun at a level that can be managed.

Memorial Events

As an off-air activity, events play an important role in providing listeners with an opportunity to learn with their five senses about disaster prevention and about the importance of life. Unlike watching TV or listening to the radio, participation in events creates opportunities to actually experience many things.

Also, informing TV and major radio stations in advance that the community radio will broadcast an event live on the theme of natural disasters, and broadcasting the event live will result in many listeners gathering and participating. Broadcasting events in which residents participate, gives listeners a sense of participation and a feeling that it is something close them.

For example, through live broadcasting of annual memorial events of natural disasters that are held together with local residents, we can pass on to listeners experiences of disasters, the message of the preciousness of life, and the importance of disaster prevention activities.

Another event representative of a disaster prevention event is the ‘town-walk workshop.’ It is an open event where Radio FMYY listeners can listen to disaster prevention specialists, program personalities and announcers as they walk around the town looking at it from a disaster prevention perspective. It is an event combining disaster prevention study and hiking.

Live coverage of the event with commentators and announcers gives listeners who cannot participate the chance to learn about things that are useful in times of disaster or problems that might occur in a disaster.

In this way, events provide radio stations with the opportunity to bring listeners directly in touch with disaster damage risk reduction. Also, live broadcasting of these events can give listeners the feeling they are actually at the event.

1.17 Kobe ni Akari wo in Nagata (1.17 “Bring Light to Kobe” in Nagata)

On the anniversary of the Great Hanshin-Awaji Earthquake (January 17), the commemorative event

1.17 Kobe ni Akari wo in Nagata (1.17 “Bring Light to Kobe” in Nagata) is held together with many listeners and local residents as a memorial to the victims of the earthquake as well as to increase disaster prevention awareness. The figures “1.17” are created with candles which are lit at the time the earthquake struck. At that time all participants offer a silent prayer for the repose of the spirits of earthquake victims. The event includes the singing of a song born from the earthquake by junior high school students, a Japanese drum performance in memory of the victims and for the recovery of the disaster-hit area and music performances on stage. Radio FMYY broadcasts live radio coverage of these memorial events as well as talks about earthquake experiences and disaster prevention activities with earthquake victims, specialists, local government staff, NGO staff and various artists from its outdoor studio set up at the event venue.

However, as time passes, the number of these events has decreased. In order to prevent the experiences of the earthquake disaster from being forgotten, we produce programs that pass on the lessons learned from the earthquake to enhance residents’ disaster prevention awareness, and provide other community radio stations with these programs. As well as this, we provide live coverage of events in the disaster-hit area on January 17 by telephone to a number of radio stations.



Program – “*Daishinsai wo kataritsugu*” (Continuing to talk about the great earthquake disaster)

In order to prevent the experiences of the Great Hanshin-Awaji Earthquake from being forgotten, a thirty-minute program “*Daishinsai wo kataritsugu*” (Continuing to talk about the great earthquake disaster) is broadcast every week on Sundays (holidays).

In this program we want to pass on to future generations the important themes of “The Preciousness of Life” and “Lessons Learned from the Earthquake,” and create communities that can cope with natural disasters by having disaster victims, disaster-relief volunteers, local government staff and specialists, etc. discuss the earthquake disaster and how to create disaster-strong communities. The program is uploaded onto the Internet the following day and can be downloaded on demand by those who missed it.



Fukkotai “*Yumehikaru machi wo*”

“*Yumehikaru machi wo*” (Dream-light to the city), a song expressing the pain of the earthquake disaster and the desire for recovery, composed and sung by a 3-member band “*Fukkotai*” who were victims of the Great Hanshin-Awaji Earthquake, is broadcast as the theme song of a daily lunchtime regular program. Listeners who hear “*Yumehikaru machi wo*” sing it as their own song on various occasions. The song has now become the community’s theme song.



Sources of Information

Disaster Management Audio Materials

<http://www.drlc.jp/dmam/>

Free and Open Source Disaster Management system “SAHANA”

<http://www.sahanafoundation.org>

Asian Disaster Reduction Center (ADRC)

<http://www.adrc.asia/>

Asian Disaster Reduction and Response Network (ADRRN)

<http://www.adrrn.net/>

Asian Disaster Preparedness Center (ADPC)

<http://www.adpc.net/v2007/>

UN International Strategy for Disaster Reduction

<http://www.unisdr.org/>

UN Office for the Coordination of Humanitarian Affairs

<http://ochaonline.un.org/>

UNCRD Disaster Management Planning Hyogo Office

<http://www.hyogo.uncrd.or.jp/>

Relief Web

<http://www.reliefweb.int/>

International Federation of Red Cross and Red Crescent Societies

<http://www.ifrc.org/>

SEEDS India

<http://www.seedsindia.org/>

Mercy Malaysia

<http://www.mercy.org/my/>

Gender and Disaster Network

<http://www.gdnonline.org/>

INTERNES

<http://www.internews.org/>

JICA Hyogo/Disaster Reduction Learning Center (DRLC)

<http://www.drlc.jp/english>

Combine Resource Institution (CRI)

<http://www.combine.or.id/>

World Association of Community Radio Broadcasters (AMARC)

<http://www.amarc.org>

Profiles of Organizations

JICA Hyogo / Disaster Reduction Learning Center (DRLC)

Japan, as one of the world's natural disaster-stricken countries, has accumulated a fair amount of disaster reduction knowledge. In addition, Japan has provided emergency disaster aid for developing countries and has encouraged the efforts to improve disaster reduction measures and the commitment to disaster reduction in affected countries and areas.

On April 1, 2007, Hyogo Prefecture Government and the Japan International Cooperation Agency (JICA) established the Disaster Reduction Learning Center (DRLC) as a base to more efficiently foster the personnel who will be involved in disaster reduction in developing countries.

DRLC is committed to making full use of Japan's disaster experiences, lessons we have learned from them and the expertise in disaster reduction/prevention we have accumulated with an aim of effectively fostering international personnel in the field of disaster reduction/prevention.

World Association of Community Radio Broadcasters (AMARC) Japan Working Group

Through service to members, networking and project implementation, the World Association of Community Radio Broadcasters AMARC, brings together a network of more than 4,000 community radios, Federations and community media stakeholders in more than 115 countries. The main global impact of AMARC since its creation in 1983, has been to accompany and support the establishment of a world wide community radio sector that has democratized the media sector. AMARC advocates for the right to communicate at the international, national, local and neighborhood levels and defends and promotes the interests of the community radio movement through solidarity, networking and cooperation.

AMARC JAPAN WORKING GROUP was established on June 23, 2007 with its secretariat office located within the office of Radio FM YY (Wai-Wai).

Combine Resource Institution (CRI)

Combine Resource Institution (CRI) is a non-government organization in Indonesia, established in 2001. It works to support the management of community knowledge through community-based information and communication networks. The main activities of CRI include the development of data and information management system for communities, development of appropriate information technology and education on media for the community. The development of community broadcasting networks in Indonesia is one of CRI's concerns. The head office is located in Bantul, Yogyakarta Special Region. Area of operation covers the entire territory of Indonesia. CRI has experiences in the field of disaster management through the utilization of information and communication technology for emergency response and early recovery stages; for instance, after the earthquake and tsunami in Aceh and North Sumatra (2004), earthquake in Nias (2005), eruption of Mount Merapi in Yogyakarta and Central Java (2006), earthquake in Yogyakarta and Central Java (2006), earthquake and tsunami in Mantawai (2007), and the latest earthquake in West Java and West Sumatra (2009).

Handbook for the utilization of DMAM

(Disaster Management Audio Materials)

for Community Based Disaster Management

Editors:

Futoshi Yokokawa
Tomoyo Kawaike
Tomoyuki Sakoi
Junichi Hibino
Shizuyo Yoshitomi
Bernard Farrell
Akhmad Nasir
Ade Tanesia Pandjaitan
Elanto Wijoyono
Saiful Bakhtiar

Many thanks to:

UNCRD Disaster Management Planning Hyogo Office
AMARC Asia Pacific
Radio FM YY
Multilanguage Center FACIL
SEEDS Asia
Imam Prakoso
Sabar Rina
Carla Takaki
Chinatsu Mitsunaga

Contact Information

Hyogo International Center, Japan International Cooperation Agency (JICA Hyogo)
Disaster Reduction Learning Center (DRLC)

1-5-2, Wakinohamakaigan-dori, Chuo-ku, Kobe City, Hyogo Prefecture 651-0073 Japan
TEL:+81-78-261-0386 FAX:+81-78-261-0387

No use of this publication may be made for resale or other commercial purposes without prior written consent of JICA Hyogo/DRLC. All images remain the sole property of the sources and may not be used for any purpose without written permission from the sources.



JICA Hyogo/Disaster Reduction Learning Center (DRLC)
jointly with
AMARC Japan Working Group
Combine Resource Institution