THE ROLE OF HEALTH COMMUNICATION SYSTEM IN THE DISASTER MANAGEMENT IN EAST JAVA

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A Communication System is a subsystem in a disaster management. The disaster management must first be understood, before the role of the communication system can be explained.
In this paper an outline of the disaster management in East Java will first be describe and then the role of the communication system to support the disaster management will be explained.

1. The basic requirement for a successful disaster management.

There are many definitions for disaster used by different authors. In this paper disaster is defined as an event that causes many victims that need medical help immediately that can not be provided by the existing health facility in its routine mode ot operation.
According to that definition several important characteristic can be mentioned in a disaster :

- there are many victims many of them are in serious condition
- it happens in a relatively short time.
- they need medical help in the shortest time possible.
- the existing facility and the routine mode of operation is not adequate to provide the needed help.

From those characteristic a basic requirement for a successful disaster management can be drawn, and that is :
There must be an effective Disaster Management Organisation that is able to do the following functions :

- it is capable to organize all available resources to respond in

an effective and efficient way at any time when disaster happen.
- it is capable to obtain the earliest information about the occurance of disaster.
- it is capable to mobilize appropriate and adequate resource to respond effectively and efficiently to disaster.
- it is capable to coordinate the mobilized resource.
- it is capable to mobilized and coordinate the resource in the shortest possible time.
- to have all the support system to do all the above functions such as :
  - the communication system
  - the transportation system
  - the funding system

II. The basic organizational framework for disaster management in East Java.

There are 3 basic organizational framework to manage disaster in East Java namely :

A. The Referral System
B. The Emergency Medical Service System
C. The Disaster Management Organization

A. The Referral System.

In accord with the National Health System, there are 4 level of referral System in East Java, namely :

1. The Community Health Centre
   The Community Health Centre managed by General Practitioner provide the basic medical and health care service to the Community in a district (The lowest level of government Administration in Indonesia)

2. The Class C Hospital.
   This is the lowest level hospital to receive referral from the Community Health Centre.
   In a Class C Hospital there are 4 basic specialty services: Surgery, internal medicine, pediatrics and obstetric and gynecology.

3. The Class B Hospital.
   Class B Hospital is the referrat hospital for class C Hospital. In Class B Hospital there are all specialty services.
4. The Class A Hospital.
   In Class A Hospital there are all specialty and subspecialty services.

In East Java there are 4 Subregional referral System

1. The North Subregion with Surabaya as the centre.
   (Dr. Soetomo Hospital, Class A Hospital)
2. The West Subregion with Madiun as the centre.
   (Dr. Soedono Hospital, Class C Hospital)
3. The South Subregion, with Malang as the centre.
   (Dr. Saiful Anwar Hospital, Class B HOspital).
4. The East Subregion with Jember as the centre.
   (Dr. Soehandi Hospital, Class B Hospital)

All those Subregions are coordinated by Surabaya (Dr. Soetomo Hospital) as the highest referral hospital.
The Radio Communication System is organized in accordance with that referral system

B. The Emergency Medical Service System.

In accordance with The Indonesian Health Department regulation every hospital in Indonesia must have an emergency department. In every subregion of the referral system in East Java, those emergency department work in cooperation with each other. As an example in Surabaya urban and Sub-urban area the cooperation involves all hospitals, the government, the private and the arm forces hospital. In that cooperation besides the usual phone communication System function routinely day to day as a support system in the referral system, when disaster happen that basic referral framework is used more intensively and extensively; and the Communication System, is used to activate, to mobilize and to coordinate all resources involved in the disaster management.

C. The Disaster Management Organization and the Operation Mode of The Disaster Management Team.

1. The Disaster Management Organisation.

Besides those day to day referral activities that happen between hospital in the Emergency Medical Service System, there is a special organization The Disaster Management Organization. It involves all sectors that participate in the disaster management. The participating components include the hospital, the Indonesian Red Cross, the regional health officers, the armed forces, the police, the boy scout, the civil defense or Organization, the Indonesian Amateur Radio Association and the Indonesian Search and Rescue Organization.

The Role of the Disaster Management Organization is:

- to develop basic policy for disaster management.
- to do all activities that is considered necessary for a successful disaster management, such as :
  - Standardization, registration and development of manpower, equipment, drugs and health facilities.
- Standardization, registration and development of communication and transportation system.
- training and education for medical, paramedical personel and layman.

2. The Disaster Management Team and its Mode of Operation.

When disaster is happened the Disaster Management Team is activated. The following basic organizational structure and operation method is used.

The team consist of several structural components (*see diagram 1*) The field post is the post that coordinate teams that provide help at the site of the disaster.

The front post, is the nearest hospital to the site of the disaster. Its role is to provide further help to the more serious victims. The command post is the centre referral hospital.

Its role is to coordinate the disaster management operation and at the same time functions as the highest referral

hospital to provide further help to the most severe victims.
The reserve posts are the hospitals that are used to receive victims in a situation when the disaster is such that very many victims fall and need hospitalization.

The role of the communication system is to activate, mobilize and coordinate all the activities of the Disaster Management Team that consist of those 4 basic structural components. The centre of the communication system is at the command post.

The disaster management operation is done in 5 stages :

a. The alert phase
b. The initial phase
c. The planning phase
d. The operation phase
e. The post operation/evaluation phase

The role of the communication system at those phases is:

- At the alert and initial phase, to report, to give as complete as possible the description of the disaster such as, the location, the estimate number of the victims, the prediction of the further development of the disaster.
- At the planning phase the communication system is used to inform health units that are going to be involved at the operation stage.
- At the operation stage the communication system is used to coordinate the activities of the different components of the team.
- At the post operation stage the communication system is used to make a final report that include the identification the number and the distribution of the victims in different hospitals.

III. The Communication System.

The phone communication system is the same as elsewhere.
The number 118 is used as an emergency call number for the public. The Health Radio Communication System probably has some important characteistic and will be described further.

1. The Channel of the Health Radio Communication System.

There are 4 channels used for the radio communication :

a. The open channel of the Indonesian Radio Amateur Association.
b. The close medical channel (A special band of the Indonesian Radio amateur Association)
c. The Police channel.
d. The Armed Forces channel.

a. The open channel.

The open channel uses the band of the Indonesian Radio Amateur Association.
The special use of this band is to have an open communication with the community and between health units. The public must have access to the health unit to report the occurrance of a disaster. The health unit must have access to the public to ask for and to direct their participation. The open channel is also used for communication between health units as long as the nature of the information transferred is open to public.

b. The close medical channel.

The close medical channel uses a special band of the Indonesian Radio Amateur Association.
The closed medical channel is used for transferring information that by their content they must be restricted only for health units or health proffesionals.

c. The Police Channel.

This channel is used for special purpose; that is when for disaster management operation or other activity there must be a very closed cooperation between the Emergency Management Team and the police.

d. The Armed Porces Channel

The Channel is also used only for special purpose as has been described in point c above.

4. There is a Health Communication System to support the Emergency Medical Service System.
   The Communication System consists of :
   A. The usual telephone communication
   B. The radio communication that uses :
      a. The special band of the Indonesian Amateur Radio Association
      b. The special medical radio communication
      c. In a very exceptional case the Police and the Army radio communication can also be used.

5. There is Disaster Management Organization with inter sectoral membership :
   The Indonesian Red Cross, the Indonesian Radio Amateur Association, the Indonesian Search and Rescue Organization, the Hospital Association, the Indonesian Civil Defence, the Boy Scout, and other person or organization that are important to have a successful disaster management program.
   The main function of the organization is to do all the basic activities so that it is always in a state of readiness to provide effective and efficient help when disaster happen.

6. When disaster happen a Disaster Management Team is activated
   The basic structure consist of :
   a. The field post to coordinate help at the site of disaster
   b. The front post located at the nearest hospital to function as the first referral post.
   c. The command post located at the hospital that function as the center for referral and at the same time it function as the center for communication and coordination.
   d. The reserve post that function as reserve hospital to receive victims in case the member of the victims is exceptionally high.

The referral and the communication system used in a disaster is the referral and the communication system used in the Emergency Medical Service System (see point 3 and 4).
The role of the health communication system in a disaster is to activate, to mobilize and to coordinate all activities that is necessary to provide an appropriate and adequate help in the shortest possible time.

2. **The coverage and the organisation of the Health Radio Communication System.**

   The coverage of the Health Radio Communication System is the whole East Java; either by direct call using repeater or by relaying information through several points to reach its ultimate destination. The organisation of the communication system is in accordance with the referral system (see point II A and II B).

3. **The role of the Health Communication System.**

   There are 2 basic roles of the Health Communication System :

   a. In time of no disaster it is used to support the referral system especially the referral system in Emergency Medical Service System.
   b. In time of disaster it is used by the disaster Management Team to activate, mobilize and coordinate all the activities of the different components of the team.
      The detail of this operation is described in paragraph II C point 2 above. The important activity of the communication system in the year 1985–1986 is summarized in table 1.

IV. Summary

1. Based on the Indonesian National Health System the basic Organizational structure of the health care is a referral system. It begins with the Community Health Center followed by Class C Hospital, Class B Hospital and end with Class A Hospital.
2. East Java Province is divided into 4 subregional referral system, North with Surabaya (Class A hospital) as the center, west with Madiun (Class C Hospital) as the center, South with Malang (Class B Hospital) as the center, and East with Jember (Class B Hospital) as the center. All those subregions are coordinated by Surabaya as the top referral hospital.
3. There is also an Emergency Medical Service System for the emergency care by the emergency department of all hospitals that includes government, private and armed forces hospital. The Emergency Medical Service System is also divided into 4 subregional reteral gional referral system as mentioned in point 2 above.

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ITU RADIO REGULATIONS

RESOLUTION No. 10

(MICHAEL LINNAN, MD)

ANNEXES
Annex I.A

Relating to the Use of Radiotelegraph and Radio telephone Links by the Red Cross, Red Crescent, and Red-Lion and Sun Organizations

The World Administrative Radio Conference, Geneva 1979,

considering

(a) that the worldwide relief work of the Red Cross, Red Crescent, and Red Lion and Sun Organizations is of increasing importance and often indispensable;
(b) that in such circumstances normal communication facilities are frequently overloaded, damaged, completely interrupted or not available;
(c) that it is necessary to facilitate by all possible measures the reliable intervention of these national and international organizations;
(d) that rapid and independent contact is essential to the intervention of these organizations;
(e) that for international relief work of the Red Cross, it is necessary that the national Red Cross, Red Crescent, and Red Lion and Sun Organizations be able to communicate with each other as well as with the International Committee of the Red Cross and the League of Red Cross Societies;

decides to urge administrations

1. to take account of the possible needs of the Red Cross Red Crescent, and Red Lion and Sun Organizations for communication by radio when normal communication facilities are interrupted or not available;

2. to assign to these organizations the minimum number of necessary working frequencies in accordance with the Table of Frequency Allocations; in the case of fixed circuits between 3 MHz and 30 MHz, the frequencies shall be selected, as far as possible, adjacent to the amateur bands;
3. to take all practicable steps to protect such links from harmful interference.

Annex I.B

ITU RADIO REGULATIONS
RESOLUTION No. 640

Relating to the International Use of Radiocommunications, in the Event of Natural Disasters, in Frequency Bands Allocated to the Ammateur Service

The World Administrative Radio Conference, Geneva, 1979

considering

(a) that in the event of natural disaster normal communication systems are frequently overloaded, damaged, or completely disrupted;
(b) that rapid establishment of communication is essential to facilitate worldwide relief actions;
(c) that the amateur bands are not bound by international plans or notification procedures, and are therefore well adapted for short-term use in emergency cases;
(d) that international disaster communications would be facilitated by temporary use of certain frequency bands allocated to the amateur service;
(e) that under those circumstances the stations of the amateur service, because of their widespread distribution and their demonstrated capacity in such cases, can assist in meeting essential communication needs;
(f) the existence of national and regional amateur emergency networks using frequencies throughout.
(g) that in the event of a natural disaster, direct communication between amateur stations and other stations might enable vital

communications to be carried out until normal communications are restored;

recognizing

that the rights and responsibilities for communications in the event of a natural disaster rest with the administrations involved;

resolves

1. that the bands allocated to the amateur service which are specified in No. 510 may be used by administrations to meet the needs of international disaster communications;
2. that such use of these bands shall be only for communications in relation to relief operations in connection with natural disasters;
3. that the use of specified bands allocated to the amateur service by non-amateur stations for disaster communications shall be limited to the duration of the emergency and to the specific geographical areas as defined by the responsible authority of the affected country;
4. that disaster communications shall take place within the disaster area and between the disaster area and the permanent headquarters of the organisation providing relief;
5. that such communications shall be carried out only with the consent of the administration of the country in which the disaster has occurred;
6. that relief communications provided from outside the country in which the disaster has occurred shall not replace existing national or international amateur emergency networks;
7. that close co-operation is desirable between amateur stations and the stations of other radio services which may find it necessary to use amateur frequencies in disaster communications;
8. that such international relief communications shall avoid, as far as practicable, interference to the amateur service networks;

invites administrations

1. to provide for the needs of international disaster communications;

2. to provide for the needs of emergency communications within their national regulations.

Annex I.C

ITU RADIO REGULATIONS RECOMMENDATION No. 1

Relating to the Use of Space Radiocommunication Systems in the Event of Natural Disasters, Epidemics, Famines and Similar Emergencies

The World Administrative Radio Conference, Geneva, 1979.

considering

(a) that, in the case of natural disasters, epidemics, famines and similar emergencies, lives can be saved by prompt and effective relief;
(b) that rapid and reliable telecommunications are essential for relief operations;
(c) that, through damage or from other causes, the normal telecommunications facilities in disaster areas are often inadequate for relief operations and cannot be restored or supplemented quickly through local resources;
(d) that use of space radiocommunication system is one of the means by which rapid and reliable telecommunications could be provided for relief operations;

noting

(a) that known planning of space radiocommunication systems makes no provision for specific frequencies or channels for emergency communications;
(b) that in the absence of such planning it is not feasible to proceed with specifications for rapidly transportable, universally operable earth stations;
(c) that CCIR Report 554-1 gives current results of studies of transportable earth stations for relief operations;

recommends

1. that administrations, individually or in collaboration, provide for the needs of possibile relief operations in planning their space radiocommunication system and identify for this purpose preferred radio-frequency channels and facilities which could quickly be made available for relief operations;

2. that administrations concerned waive the coordination procedure provided for in the Radio Regulations in the case of transportable earth stations used for relief operations;

invites the CCIR

to continue its study of the standard specifications and preferred frequencies for transportable earth stations and for compatible mobile and transportable fixed radiocommunications equipment for relief operation.

Panel Discussion =5

THE USE OF COMMUNICATIONS IN EMERGENCY SITUATIONS

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1. INTRODUCTION

Indonesia consists of more than 13.000 islands, around 6000 of which are inhabited. Jungles, mountains, vulcanoes, wide rivers and deep seas are abundant.

The population, now numbering more than 160 million, is not evenly distributed throughout the archipelago.

From these conditions it is recognized that the establishment and maintenance of transportation (land, sea and air) as well as telecommunications pose a number of unique problems. Development is physically difficult and also expensive indeed.

The existing facilities may be very insufficient to serve the current and pressing demands. The telephone density is around 0,49 in Indonesia, signifying less then 2 telephones for every 1000 inhabitants. Penetration of telecommunication services is available to about 59% of the 3.538 subdistricts ("kecamatan" – level), and in some cases not a round–the–clock (24 hours a day) service.

Especially important to this workshop is the requirement of the Health Sector in achieving its goals, including preparedness for health emergencies. This is not an unique requirement in Indonesia, because many sectors face a similar problem.

2. THE ROLE OF COMMUNICATIONS IN EMERGENCIES

Before we can organize any means of communications to assist in relieving an emergency situation, we have to have an understanding of the meaning of the term "EMERGENCY SITUATION".

Criteria often used to describe an emergency situation are as follows :

a. This situation exist when human lifes and or property have been or are gravely endangered.

b. Can happen any time and in many cases unpredictable,

c. Can happen in any location, both in cities that are densely populated as well as in remote areas and scarcely populated. Within these remote areas are to be included land, rivers and seas,

e. Number of people affected can range from a single individual to a groups of individuals to whole villages, cities or regions,

f. Help is required.

The success of giving relief and assistance in any emergency situation mostly depends on the fastest information received and the possibility to send messages by a "central" emegency unit to the affected location(s).

The constraints and challenges in the development of the national telecommunication system could give rise also to problems in establishing means for communications in times of disasters and emergencies.

Even when roads are not possible to be reached or used, even when vehicles are stranded, it might be possible to communicate through electronic means, radio communications being the least vunerable to natural obstacles during emergencies. When the–emergency which arises does not affect transportation means, communications through wires or cable could also be an immense help in relaying communications quicker than by physical means.

The obvious problem in developing countries, such as Indonesia, is of course that telecommunicàtion means are as yet not available in every location, village or other populated areas, in fact the ideal of "a telephone within easy reach of every member of the community" is still far away from realization.

When this goal is eventually reached, availability of emergency communications will be critical only if natural disasters occur and damage the communication means existing (recent example: the earthquake in North Sumatra disrupted normal telecommunications from the affected area for several hours, because of damage to the telephone exchange).

It is clear, that emergency traffic or messages have absolute priority in cases of emergencies. However, to be sure that this happens in the real situation, regular "drills" have to be carried out, simulating the real occurence of an emergency.

3. DEALING WITH AND MANAGING EMERGENCY COMMUNICATIONS IN DEVELOPING COUNTRIES.

The report of the INDEPENDENT COMMISSION FOR WORLDWIDE TELECOMMUNICATIONS DEVELOPMENT, the MAITLAND report, published several years ago, stated that any project in a developing country could not be called complete, if it did not during its inception, planning and execution include the provision of the necessary telecommunication facilities. The essence of this statement is, that investment in telecommunications should go in pace with development of any project of any sector. The statement in its operational sense should be interpreted as requesting that projects should put aside enough resources, so that telecommunications facilities between the project location(s) and the nearest hookup point of the public telecommunications network could be constructed.

This action would be the solution, to ensure normal communications and at the same time obtain preparedness for emergency situations.

Chances are, however, that the investment decision does not give sufficient attention to this concept, thereby penalizing in fact its own preparedness in facing emergency situations, as well as its routin requirements for communications. Several cases in Indonesia's experience show good sense of the project planners, notably sectors that are communication sensitive, and therefor communication minded, for instance in airport projects, oil business, meteorology etc.. Fortunately also, other sectors which were "traditionally" less observant in this matter are beginning to follow the example of the sectors mentioned above.

It has been, and it will remain an prudent national policy guideline, to adhere to the following principles:

a. Integration with the public telecommunications network as much as possible.

b. If the public network is not available, try to hook up to the nearest feasible point in the public telecommunications network.

c. Only in cases where absolutely necessary, and technical and operational capabilities in maintainance and operation can be supported even in the long run, private networks could be established

Are there other solutions other than the foregoing, rather "ideal sounding" actions ?

Of course there are, but I would like to point out right from the beginning, that the solutions are only meant as temporary or localized solutions, rather than structural solutions, and therefor can not be used as routine communications practices.

The amateur radio bands as well as the Citizen Radio communications are in many countries, including in Indonesia respected as the emergency communications means, to be dedicated to deal with emergencies on a priority basis. Legally speaking, only certificate holders are authorized to man the stations, but that by itself is ensured by the pledge of these certificate holders: ". . . . . to be ready to serve the community in case of emergencies . . . . . ."

The military and many private networks, government and private broadcasting stations are also licenced to operate in Indonesia. These networks, according to the ITU CONVENTION, are all to be used in cases of emergency. The SEARCH and RESCUE organization, being a skeleton organization has the task to coordinate and supervise emergency communications in disaster situations. For emergencies at sea, the INMARSAT has developed emergency communication systems.

It is probably necessary, that managers and officers in charge of health control and similar functions, be thoroughly acquainted with the locations of the relevant emergency communications facilities of the neighbourhood and know the procedures to obtain access to these facilities if needed.

4. TECHNOLOGY

Telecommunications technology is advancing very fast It makes sense, that besides the traditional forms of radio communications familiar to us, newer technologies be explored to give more effective and efficient solutions for communications in emergency situations.

This forum is not the place to go to deep into the details, but for Indonesia, my Directorate General together with the operating com-

panies and telecommunications industries and suppliers are aware of possible applications of several of these new technologies. These are among others: Subscriber Radio stations, Very Small Satellite Earthstations, Radio Trunking networks (combining a number of private networks) and usable for fixed as well as mobile stations (ambulances), etc.

However, these solutions could still be very costly and carefull planning to find the best configuration is necessary.
These solutions are essentially for establishing routine communications capabilities using radio that could be used in emergency situations as well.

But also in the radio amateur field, more sophisticated technologies are being used nowadays, or at least experiments being carried out, which may lead also to better communications during emergencies.

5. CONCLUSIONS

a. There is no easy answer to the problem of having communications within easy reach under any situation or at any location, especially in developing countries.

b. Eventhough public communication means, the military and police networks, as well as private and other telecommunications facilities (amateur radio, citizen band) can be used with absolute priority during emergencies, in some situations these are not always available.

c. Newer technologies may give the answer to speed up the availability of routine telecommunications means in densely populated as well as in remote areas. In realizing these means, thorough planning and adherence to several technical and operational guidelines is necessary.

Jakarta, September 1987