The Republic of Indonesia
Ministry of Communication andInformation Technology

PREPARATORY SURVEY REPORT ON THE PROJECT FOR STRENGTHENING DISASTER MANAGEMENT INFORMATION SYSTEM IN THE REPUBLIC OF INDONESIA

February 2016

Japan International Cooperation Agency (JICA)

Kokusai Kogyo Co., Ltd.

PREFACE

Japan International Cooperation Agency (JICA) decided to conduct this preparatory survey and entrust the survey to Kokusai Kogyo Co., Ltd.

The Survey team held a series of discussions with the officials concerned of the Government of Indonesia, and conducted field investigations. Following further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the Project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Indoensia, for their close cooperation extended to the survey team.

February 2016

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SUMMARY

1. Outline of the Recipient Country

(1) Natural conditions

Indonesia is an archipelago country, located between two continents of Asia and Australia, and between the two oceans, the Indian and the Pacific. The archipelago is stretched from Ache in the Sumatra Island in the west end up to Papua Balat in the Papua Island in the east, approximately 5,100 km in its entire length, making it the largest archipelago country in the world. The total area of the country is 1,920,000 km^2, which is about 5.5 times larger than Japan and the country consists of about 14,000 islands of various sizes. Out of all islands, residents reside only in about 3,500 islands.

The geo-topological feature of the archipelago can be characterized with two mountainous ranges. One range stretches from the Philippines in the north, through Kalimantan, to the eastern part of the country. The other extends from the Burma Mountains of the continent, through the west coast of the Sumatra, Java, and Bali islands and then leads to Sulawesi Island. The archipelago belongs to the Pacific Ring of Fire and consists of 128 volcanoes, out of which 78 volcanoes are active.

The country is located in the vicinity of the equator and the climate can be classified as the oceanic tropical monsoon climate and generally have two seasons; the dry season from April to September and the rainy season from October to March. The temperature change throughout the year is generally small.

(2) Social and economic conditions

According to the statistics of the Indonesian government from 2013, the population of the country is about 249 million which is the fourth largest in the world after China, India, and the United States. About 70 percent of the population is concentrated in Java Island of which area accounts only for 8 percent of the whole country area.

The Indonesian government, on the basis of the agreement with the IMF, has carried out an economic structural reform mainly in the banking sector and the corporate sector after the Asian currency crisis in July 1997. Based on the stabilization of the political, social and financial situations and an expansion of personal spending in the country, the economic growth rate has been achieved at a relatively high growth rate by the second half of 5 to 6% except in 2009 due to the impact of the global financial and economic crisis. In 2010, the nominal GDP per capita has exceeded 3,000 UD Dollars. However, there has been a deficit of the current account and the currency depreciation and improvement of payments by promoting export has become an issue.

Gross Domestic Product (GDP) of the country is 8,696 billion US Dollars, Gross National Income (GNI) is 3,580 US Dollars per capita and the economic growth rate is 5.8% (2013). More than 80% of the economic activities in the country are concentrated only in three islands of Java, Sumatra and Bali.

2. Background of the Project

(1) Overall goal

The Indonesian government formulated the Indonesia Broadband Plan (IBP) in 2014 to aim to develop and

strengthen the infrastructure and services for the information and communication in the country, such as Information and Communication Technology (ICT), the internet and broadcasting fields, in order to contribute to the economy, society, culture, defense and safety of the country. The IBP was stipulated on the basis of Presidential Decree (No. 96-2014) and it has been approved as a national long-term plan. IBP, as the axis of the e-Government which aims to cooperate among ministries with reliable and high-speed communication, is intended to build the digital society in multi-fields, such as e-Health, e-Education, e-Logistics, e-Procurement, at a national scale. KOMINFO is the executing ministry of this Project, which has the jurisdiction over the information and communications field and businesses of the field in the country and is also in charge of the implementation of the e-Government.

Regarding disaster management at the national level of Indonesia, the National Disaster Management Plan (NDMP) is formulated every 5 years mainly by the National Disaster Management Agency (BNPB) under the adjustment of the National Development Planning Ministry (Kementerian PPN) and Development Planning Agency (BAPPENAS). The NDMP is stipulated based on the national disaster management law (Article 36, Law No. 24-2007) and the Decree (Section 5, Article 6, BNPB Decree No. 21-2008). The NDMP plays the role of a guideline to reflect the measures to reduce disaster risks into strategic plans of national ministries and agencies (totally 37 national organizations) and regional disaster management plans in local governments. The role of KOMINFO in the NDMP 2015-2019 is “to plan and manage the provision of facilities and infrastructures for communication to support disaster management”. In the NDMP, KOMINFO therefore is regarded as an implementing organization to develop and provide infrastructures for the communication of disaster management information in the country and to manage and maintain them.

In NDMP 2015-2019, related government organizations are classified into 4 groups such as the Substance Team, the Assistance Team, the Team of National Disaster Risk Reduction Action Plan (RAN PRB) and the Author Team. The Ministry of Information and Communication (KOMINFO) belongs to the Substance Team and their roles are, as defined as the above, same as described in the previous NDMP 2010-2014.

(2) Current conditions and problems

In Indonesia, natural disasters such as earthquakes, tsunamis, and floods, have frequently occurred and severe damage has been caused by disasters. The memory of the Indian Ocean tsunami on December 26, 2004 is still fresh, which killed more than 100,000 people and caused more than 30,000 people to go missing.

In 2006, after the disaster, the Agency of Meteorology, Climatology and Geophysics (BMKG) embarked on the development of Indonesia Tsunami Early Warning System (InaTEWS) for the purpose to reduce damages caused by tsunami and earthquake disasters. BMKG is the national organization responsible to monitor the climate, extreme weathers, tsunamis and earthquakes in the country and to analyze and manage the data of those natural phenomena. The Project system is going to receive tsunami and earthquake information from BMKG. It is in operation since February 2009. InaTEWS functions not only to observe and analyze occurrences of earthquakes and tsunamis, but also to transmit early warning disaster information of earthquakes and tsunamis to the previously designated government oraganzations.

In April 2007, the Indonesian government enacted its National Disaster Management Law (Law No. 24-2007). By this law (Article 10 and 17, Law No. 24-2007) and the presdent regulation (Article 2, President Regulation No.8-2008) based on this law, the National Disaster Management Agency (BNPB) has been

established as an organization responsible for the duties on the national disaster management throughout the series of disaster management processes from the Preparedness, Mitigation/Prevention, Response and Restoration. BNPB is the responsible national organization to guide disaster management activities of the central government organizations, such as ministries, national agencies, military, police and so on, and Regional Disaster Management Agencies (BPBD) and to deliver disaster information to those organizations. BNPB is also responsible for disaster education to citizens and monitoring disaster information. BNPB therefore is the crucial organization to realize the system to transmit the tsunami and earthquake information reliably and rapidly.

In the law (Article 17 and 18, Law No. 24-2007) and the presdent regulation (Article 63, President Regulation No. 8-2008) based on this law, it is also stipulated that BPBD must be established in provinces, cities, and districts and currently they are being established in regions across the whole country.

BPBDs are regional organizations responsible to plan regional disaster management and to guide for regional disaster management activities to the local citizens and regional related government organizations, such as regional municipal, military, police and so on, and also to deliver disaster information to those parties. BPBDs are also responsible to instruct evacuation activities of citizens from disasters, for the information collection at the time of damage occurrence and for other regional disaster management activities. BPBDS are therefore another crucial organizations as well as BNPB to realize the system to transmit the tsunami and earthquake information reliably and immediately.

Confusion concerning transmission of disaster information to the residents however happened when an earthquake occurred in Sumatra in April 11, 2012. It occured because the transmission of early warning by InaTEWS was delayed and disaster management organizations such as BNPB, BPBD and others could not receive the information appropriately.

The delay of information was caused by the congestion of the communication network, which was in turn caused by the concentration of use of the public network by ordinary users. It was also caused by transmissions of disaster information heavily depending on short message services (SMS) using the public communication network. In addition, the chief cause of the delay of information was the delay in detection and response to the information at the reception side by the related government organizations, though an additional part of the confusions resulted from the sender side not being able to verify and confirm whether or not the reception side successfully received the information. From the incident, it has become clear that the delay in early warning transmission could happen when the public communication network is congested, if the public network is used for the communication of the information. It has also become clear that one of problems is that the sender side is not able to verify and/or confirm the status of delivery of the information at the receiver side.

To cope with these problems, BNPB started developing ICT-MASTER PLAN for the purpose of capacity building on information transmission, emergency command and control, emergency organization, mitigation of damage and casualties, and emergency assistance in disaster management. At the same time, in June 2012, BNPB, which is legally responsible for disaster information communication in the nation, and KOMINFO which has the technical ability to transmit and communicate disaster information, agreed to collaborate in the field of disaster information communication and a Memorandum of Understanding (hereinafter, MoU) was exchanged between BNPB and KOMINFO to promote information communication for disaster management

activities in Indonesia.

In October 2014, eight government organizations which engage in disaster management activities, including KOMINFO, were assembled for a Focus Group Discussion (FGD) to develop a disaster management information system. Participants were BNPB, BMKG, Volcanic Geological Disasters Center (PVMBG), Ministry of Public Works (PU), Forest Protection Agency (PHKA), Agency for the Assessment and Application of Technology (BPPT) and National Agency for Search and Rescue (BASARNAS). In the discussion, it was agreed by the Group that KOMINFO would develop the platform for disaster management information communication and KOMINFO would initiate and promote further FGD.

To summarize, it has been confirmed that BMKG, PU, BPPT and PVMBG will develop the system to acquire, issue and provide early warning information on disasters; that KOMINFO will develop the disaster management information communication system; that KOMINFO be involved in distributing the information to citizens; that BNPB and BASARNAS perform their disaster management activities based on the information received from KOMINFO. The framework and roles of organizations of disaster management information communication have thus been confirmed as the provision of infrastructure of the communiation of disaster information though the endorsement of the legal authority of KOMINFO to play a prominent role in the field of disaster management information communication is still in progress. Meanwhile, KOMINFO has agreed with related organizations based on the meanings of the FGD and has commenced provision and development of the system to disseminate tsunami and earthquake information to the designated government organzations, mass media and so on.

(3) Background and outline of the project

In Indonesia, many kinds of disasters have occurred such as earthquakes and tsunamis, floods, landslides, volcano eruptions, storms and so on. According to statistics from 1980 to 2014, more than 190 thousand people were killed, 22.31 million people experienced damages to their properties and 23.7 billion US Dollars of economic damages were caused due to disasters.

In 2011 and 2012, the Ministry of Internal Affairs and Communications of Japan conducted a research study to apply Japanese ICT infrastructure to disaster management and prevention in Indonesia and to consider systems and specifications to strengthen and promote the disaster management and prevention field in the country. Based on the results of the research study, a Minutes of Meeting (M/M) was exchanged between the Minister of Internal Affairs and Communications of Japan and KOMINFO on April 29, 2013, which stated the necessity of the system, as well as the necessity to realize the development and construction of the system for disaster management by using ICT. In addition, a Minutes of Discussion (M/D) were exchanged between the Ministry of Internal Affairs and Communications of Japan and three parties of Indonesia, namely KOMINFO, BMKG and BNPB.

Subsequently, KOMINFO submitted a written request for “ICT disaster management systems” on August 15, 2013 and the preparatory survey was carried out in August 2014. The request from KOMINFO at that time was for provision and procurement of the central system and its equipment, procurement of equipment and technical assistance for the related government organizations, mass media and others, as shown in the below table:

Table-1: Contents of the request from KOMINFO

Item		Recipient	Quantity
Equipment Procurement	Center System	KOMINFO	1 unit
	Area Control System	BPBD	1 unit
	Operation Terminal	BNPB	1 unit
	Operation Terminal	BPBD	1 unit
	Transmitter and Disaster Information Receiving Units	KOMINFO	1 unit
	Transmitter for Radio Speaker System	BPBD	1 unit
	Transmitter for TV Broadcasting	TBC	1 unit
	Transmitter for Multiple Media	BPBD	1 unit
	Rural Area Option of Transmitter for Multiple Media	BPBD	1 unit
	Transmitter for Service Delivery Platform	TBC	1 unit
Soft Components	* Establishment of Disaster Management Plan * Small Drills using system Workshop	KOMINFO	1 unit

3. Summary of the Survey and Contents of the Project

(1) Summary of the survey

1) Survey schedule

The survey was divided into three stages; the first survey, complement for the first survey, and the second survey, and these were conducted from November 2014 to September 2015. After the field surveys, compilation and analysis of the data from the surveys were carried out in Japan, and then the system outline design, selection of equipment and the approximate estimate of the design cost were also carried out. The draft explanation about the Project outline design was conducted in January 2016.

2) Legal background to deal with disaster information

In the Law on weather, climate and geophysics (Article 29, Law No. 31-2009), it has been defined as “BMKG is to observe, manage and analyze the earthquake and tsunami information and also to generate and issue the early warning information”. In the government regulation (No. 21-2008), it has been defined as “Early warning activities, prescribed institution disaster information to potential in a specific area (authorized agencies) that tell the citizens (Section 1, Article 5)”, and “Disaster information obtained from designated (monitoring) organizations are to be delivered, based on the judgments of BNPB and BPBD, to the residents by the related government organizations private broadcasting companies and mass media (Section 4 and 5, Article 19)”.

Meanwhile, in the National Disaster Management Plan, KOMINFO is defined as responsible for the provision of infrastructure for disaster management though there is no legal basis of that KOMINFO deal with the disaster information. KOMINFO has concluded the Mutual Agreement (MA) with the BMKG for the purpose to promotion disaster information transmission and also have signed MoU with BNPB to cooperate regarding the disaster information transmission and to clarify the responsibilities among three organizations. These agreements among the organizations and KOMINFO’s Minister Decree planned to be issued in the near future can be said as the legal basis for KOMINFO’s carrying out disaster management activities.

3) Equipment plan

A disaster management information communication system shall be established by the Project. By this system, it can be expected that the early warning information be transmitted rapidly and reliably. The system shall consist of a main server group and a backup server group, and the main server group shall be functionally divided into the “transmission server” part and the “processing and management server” part.

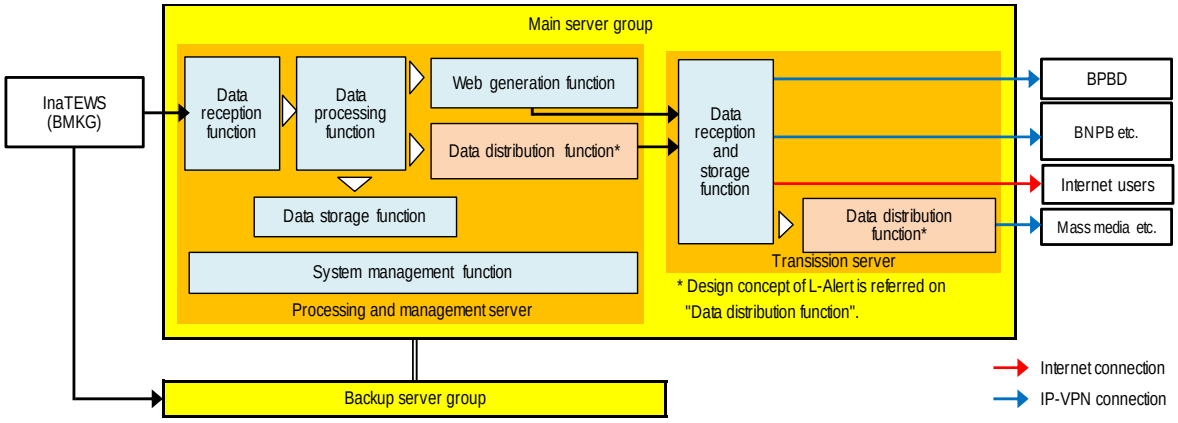


Figure-1: System configuration

The Project system will be configured to transmit early warning information to related government organizations, mass media and others rapidly and reliably. In addition, the situation of communication at recipient agencies will be monitored as to whether or not they receive the information, and when the information transmission is delayed or bounced, the system will function to allow KOMINFO and BNPB to implement the complement treatments for the malfunction.

In addition, with the aim of transmitting the information to be received from disaster information monitoring organization, KOMINFO had originally planned to install regional server in Padang on their original request. Advantages to install servers in regions are that regional information can be utilized and communicated mutually between the central and the regions.

However, KOMINFO has not had a role to collect and accumrate the disaster information and the Project system was to be designed to only transmit early warning information on tsunami and earthquakes, provided by BMKG, to the related government organizations, mass media and telecommunication carriers; a one way transmission. The necessity to install regional servers therefore had to be further examined because as equipment to acquire disaster information in regions, they did not fit the Project design.

Accordingly, functions to be required for transmitting early warning and disaster information of tsunamis and earthquakes, and the pros and cons of central versus regional installation locations, were examined.

The required functions are as below:

- Functions for database and generating a screen display to deliver information in the intranet web.
- Functions for database and generating a screen display to deliver information in the internet.
- Function for generating content for delivering data information.

As the system transmits early warning information on tsunamis and earthquakes as the one way, the central

server is enough to deal with the situation. There is therefore no advantage to install the servers for the first two functions for delivering the information to the intranet and internet. For the third, regional server installations show some superiority though not significantly, compared with the installation at the center. centralizing all server functions will minimize the volume of equipment, the number of installation locations (operation locations) and, as a result, the cost of the installation. Additionally, management and maintenance of servers can be done smoothly. Considering the above, the servers will be designed to be installed in the center (in a centralized system configuration), with the main server group in Jakarta and the back-up server group in Bali.

As the equipment to be procured in the Project is precision machinery and will be utilized for transmitting earthquake and tsunami information during disaster events, the locations and buildings housing the equipment for the system must be strong and safe, able to withstand earthquakes and other disasters. Data Centers are therefore planned to be utilized to install Project equipment, as such facilities can supply the most reliable and satisfying conditions for the equipment in terms of: building structural specifications, equipment and facilities, management and maintenance, fire extinguishing facilities, security conditions, emergency power supply, availability of electrical power for the equipment, available rack space for the equipment, and so on. From the field survey, the Cyber Building in Jakarta and Nusantara Internet Exchange (NIX) Bali in Bali are considered suitable locations to install the Project equipment because those buildings satisfy the above mentioned conditions and many government agencies, ministries and telecommunication carriers have been utilizing the buildings as their server locations.

In both buildings, the firewall to maintain network security and the load balancer for leveling the processing load with plural equipment has already been provided. Also it can be expected that the Project system will be managed effectively and efficiently as other government servers have been located and managed centrally in these buildings. Accordingly, the main server group shall be installed in Cyber Building in Jakarta and the backup server group shall be installed in NIX Bali in Bali.

The system configuration outline is shown as follows:

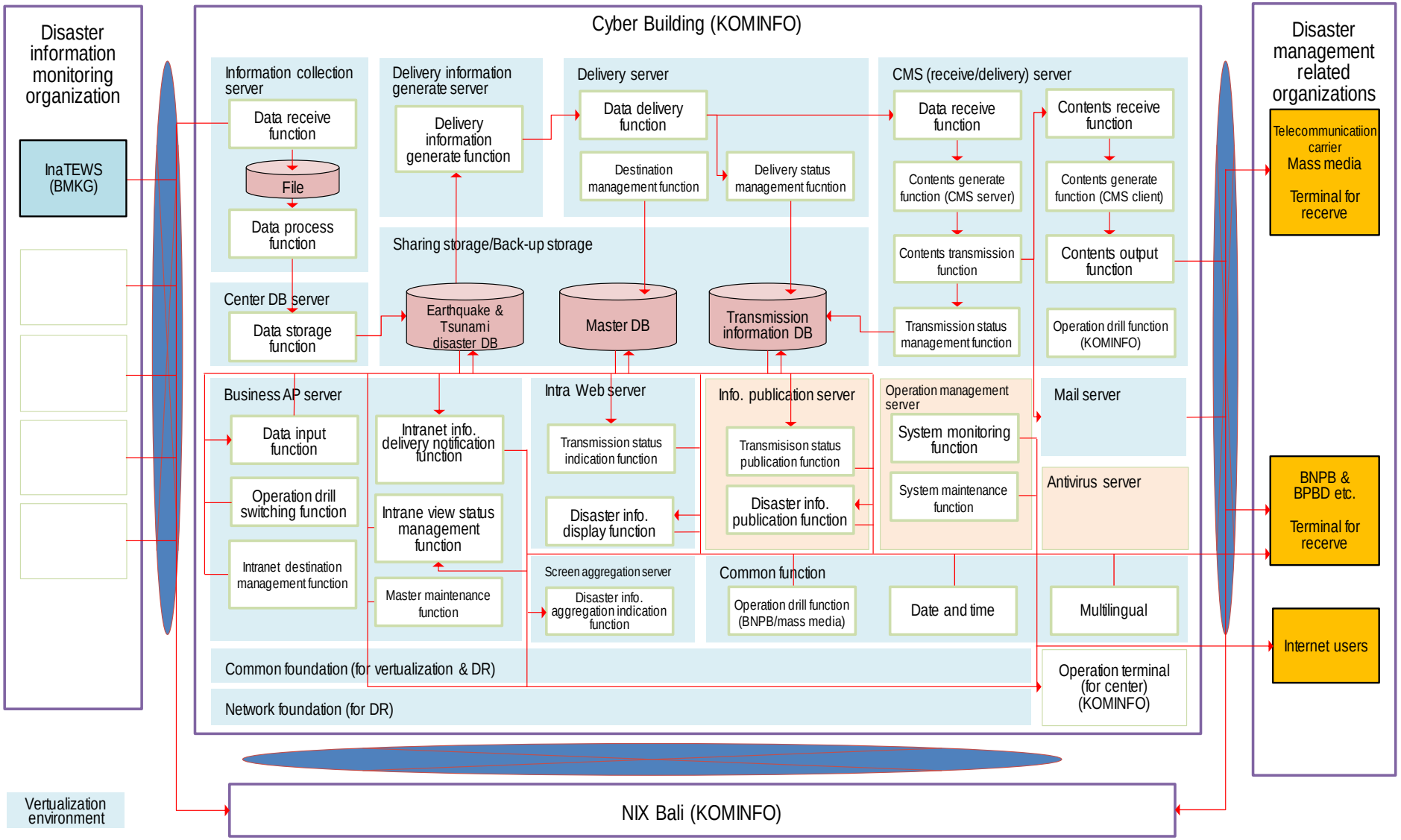


Figure-2: Outline system structure drawing

(2) Contents of the Project

The equipment to be procured by the Project is composed of hardware, purchased software and developed software. It is shown in the following list:

Table-2: List of the Equipment to be procured by the Project

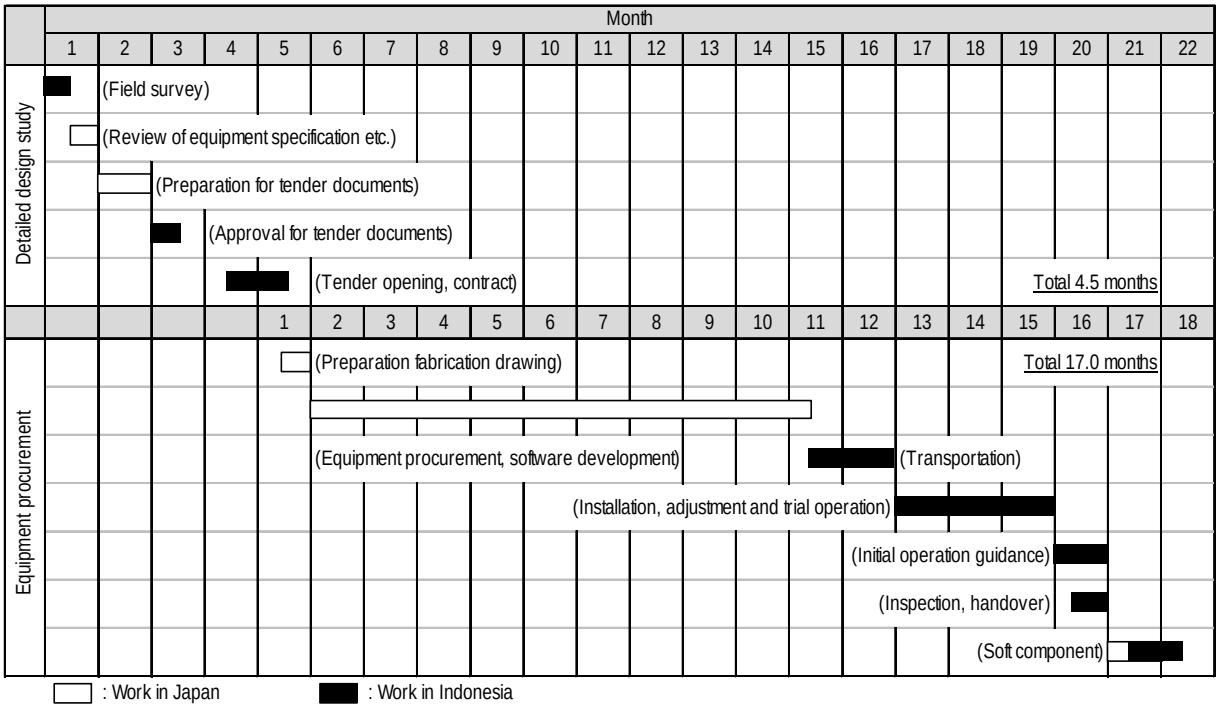
No.	Item	Final destination		Total
		Jakarta	Bali	
A. Hardware				
A-1	Virtualization server A	9	9	18
A-2	Virtualization server B	2	2	4
A-3	Virtualization server C	1	1	2
A-4	Operation monitoring server	1	1	2
A-5	Information publication server	3	3	6
A-6	Antivirus server	1	1	2
A-7	Sharing storage	1	1	2
A-8	Back-up storage	1	1	2
A-9	L2 Switch	10	10	20
A-10	L3 Switch	2	2	4
A-11	VPN router A	6	6	12
A-12	VPN router B	2	2	4
A-13	VPN router C	10	10	20
A-14	Console	4	4	8
B. Purchased software				
B-1	Server OS, cloud infrastructure	12	12	24
B-2	Server OS, cloud infrastructure (Frontend)	1	1	2
B-3	Server OS (information publication server)	3	3	6
B-4	Server OS (physical server)	1	1	2
B-5	Server OS (physical server, CAL)	1	1	2
B-6	Clustering software	1	1	2
B-7	Monitoring software	1	1	2
B-8	Back-up software	1	1	2
B-9	Data base (CMS server)	12	12	24
B-10	Data base (others)	1	1	2
B-11	Constitution management software	1	1	2
B-12	Visualization software	1	1	2
B-13	WebGIS software	1	1	2
B-14	Antivirus software (server)	1	1	2
B-15	Antivirus software (Linux client)	32	32	64
B-16	Antivirus software (Windows client)	25	25	50
B-17	Screen aggregation software	1	1	2
C. Developed software				
C-1	Information collection function	1		1
C-2	Information generation function	1		1
C-3	Information delivery function	1		1
C-4	Business application function	1		1
C-5	Intranet Web function + Intranet WebGIS function	1		1
C-6	Information publication Web function	1		1
C-7	CMS function	1		1

4. Implementation schedule and Project Cost

(1) Implementation schedule of the Project

Implementation schedule of the Project is as follows:

Table-3: Implementation schedule of the Project



(2) Project cost

In order to implement this Project, the Project cost borne by Indonesian side is 177 million IDR (Approx. 0.002 billion JPY).

5. Project Evaluation

(1) Relevance

The legal authority for KOMINFO to transmit the disaster information in the country currently relies on the MA with BMKG and the MoU with BNPB. It is defined in the National Disaster Management Plan (2015-2019) as KOMINFO to be responsible for provision of infrastructure for disaster information although more definite legal background has not been seen. In addition, KOMINFO has embarked on a demonstration experiment of Short Message Service (SMS) broadcast-transmission of disaster information by Location based Service (LBS) based on the MA with BMKG for the purpose to promote disaster information transmission in cooperation with BMKG and telecommunication carriers. Further, KOMINFO has concluded the MoU with BNPB to cooperate one another pertaining to disaster information transmission. Those documents of interagency agreements are assumed to complement the absence of legal background of KOMINFO and enough to assure their authority. It is therefore considered that KOMINFO's authority to work on disaster information in the country is clear.

Further, KOMINFO has been promoting the provision of the Disaster Management Information System (DMIS) as described in the Ministry Midterm Starategy Plan 2015-2019 and a Minister's Decree regarding the DMIS has been prepared and is planned to be issued in the near future. The decree will be a more rigid legal background that endorses KOMINFO's authority. The Decree will touch on the following issues:

- Responsibilities and roles of KOMINFO, early warning information monitoring organizations and mass communication and telecommunication carriers,
- KOMINFO's authority to enforce their supervision and guidance on mass communication and telecommunication carriers to transmit early warnings and disaster information,
- Responsibilities of mass communication and telecommunication carriers to identify citizens in the disaster influenced area and to transmit early warnings and disaster information,
- Necessary components of early warnings, disaster information and etc.

In addition, KOMINFO has embarked on a demonstration experiment of disaster information transmission, based on the interagency agreements among ministries and other government agencies, in cooperation with the BMKG and telecom operators. This is the experiment for BMKG to transmit the experimental data to telecommunication carriers and then for the carriers to disseminate the data to terminal receivers in specific geographical areas identified by the LBS. This is the system to target to transmit the data to the last one mile, which means terminal mobile users. If this LBS transmission is realized, it will be very effective to transmit the earthquake and tsunami information from the carriers to the last mile after the information transferred from this System.

It can be thus considered that the certainty of the equipment to be procured in the Project being utilized sustainably and effectively is high, considering theat KOMINFO is already taking such steps toward better disaster information communication. Thus the relevance of a grant aid project to equip KOMINFO for disaster information communication is high.

It has also been determined that the implementation of the grant aid project is relevant from the following points of view:

- At present, data transmission by SMS from BMKG has been done to individuals in disaster management organizations and the related government organizations. This data transmission is done via the telecommunication carriers though the data have not been transmitted yet from the carriers to the general mobile phone users. A significant number of users of mobile phones and users of the Internet (i.e. residents of Indonesia) will be the beneficiary of the Project because telecommunication carriers companies will be one of the recipients of information, and mobile phones and the internet can be used to distribute disaster information.
- A public communication line is currently being used by the disaster information system and congestions and delays of information occurred at the time of the 2012 Indian Ocean Earthquake due to this reason. As the Project uses a secured bandwidth communication line, it can be expected that communication of early warning information will take place more rapidly and securely and that, as a result, the Project will significantly contribute to disaster management by the residents.
- The Indonesian government has listed the establishment of the Disaster Management System at the

national level as one of its prime targets, and implementing the Project will contribute to the achievement of this target.

- KOMINFO is the main administrative government ministry that dealis with ICT and they have the skills, know-how and experience to manage and maintain equipment and systems for information communication. Currently, servers owned by KOMINFO have been regularly managed by private maintenance and management companies on a sub-contract basis and KOMINFO supervises the management companies. It can be expected that the Project equipment will be managed in the same way as above, and it is possible to conclude that KOMINFO can sustainably maintain and manage the Project system.
- The equipment to be procured by the Project will not be utilized for any profitable activities but utilized only for communicating early warning information, a purpose which has significantly high public value. It is therefore considered that the implementation of this Project will be in accordance with the primary policy objective of Japan's Grant Aid Projects.
- Construction of new facility buildings will not happen in this Project's implementation, as the equipment to be procured by the Project will be housed in exiting buildings namely the Cyber Building and NIX Bali. Accordingly, there will be no need for environmental impact assessment during the installation of the equipment and no issues of land acquisition, resident relocation and so on.
- In the current situation, by the delay and confusion of disaster information transmission, troubles have occurred on the appropriate transmission and disaster response activities to the residents. Response by the implementation of this Project is immediately required in order to minimize disaster damages caused by the tsunamis and earthquakes.
- Japan has been promoting the expansion of disaster management by utilizing ICT in overseas countries. In April 2013, it was confirmed between the Minister of Internal Affairs and Communications of Japan and the Minister of KOMINFO to introduce ICT for disaster management in the cooperation activity between the Japan and Indonesia. It is significant to utilize IC technology for the disaster management information in the country where many and various disasters happen because the technology is the strong field of Japan and the strength can be utilized effectively in the cooperation activity.
- Implementation of the Project will contribute to the promotion of implementing the "Sendai Framework 2015-2030", which was enacted in the US World Conference on Disaster Risk Reduction in December 2015, and "World Tsunami Awareness Day", which was adopted in March 2015. It can be expected by implementing the Project that the opportunities for the residents to obtain disaster information will increase and that the Project to contribute to the enlightenment of the consciousness of the tsunami and earthquake disaster management by using the training function of the Project System.

(2) Effectiveness

1) Quantitative impact

Quantitative impacts expected from Project implementation are as follows:

Table-4: Quantitative impacts from the implementation of the Project

Index		Reference value (2015)	Target value 【After 3 years from completion(2021)】
Increase in the number of organizations to whom disaster information will be delivered		2,800 ● Disaster management organizations: App.300 ● Central government: 0(*1) ● Local government: 0(*1) ● Military and police: App.500 ● Mass media: App.2,000 ● Telecommunication carrier: 0(*2)	4,728 ● Disaster management organizations: 534 ● Central government: 37 ● Local government: 507 ● Military and police: 1014 ● Mass media: 2,630 ● Telecommunication carrer: 6
Increase in the amount of information delivered	To related government organizations	869 MB/time	2,092 MB/time
	Total amount of information	1,961 MB/time	3,144 MB/time

*1 Chief of each organizations receive deisaster information as an individual rather than as organization

*2 Telecommunication carrier have not receive disaster information as Communicator to dessiminate to mobile-phone users in public

It is expected that future disaster information communication will be able to use a secure bandwith through the implementation of the Project. Quantitative impacts can be measured and the degree of progress verified by monitoring system connection records and ledgers managed by KOMINFO.

2) Qualitative Impacts

Qualitative impacts expected from the Project implementation are as follows:

- Improvement of information transmission speed
- Line congestion and transmission delay can be avoided during disaster events.
- Increase of information volume
- Information volume to deliver at a time can increase.
- Improvement of the method to confirm a status of information transmission
- KOMINFO can grasp the reception status at disaster management organizations (BNPB and BPBD).
- Improvement of the sytem of the operation to transmit disaster information
- Operation of the system can be tested and practiced through communication training during non-crisis times by implementing the communication training function in this system.

From the above, the relevance of the implementation of the Project is deemed high and the effectiveness of the Project is considered securely obtained.

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4. Minutes of Discussions
5. Soft Component (Technical Assistance) Plan
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Republic of Indonesia

The total area of the country
: 1,920,000 km^2
The population of the country
: 249 million (2013)

Target site for the survey (locations to install the equipment)

LOCATION MAP

The Preparatory Survey for the Project for Strengthening Disaster Management Information System

LIST OF FIGURES & TABLES

ABBREVIATIONS

Abbreviations	English / Bahasa indonesia
AC	Alternating Current
AP	Application
B/A	Banking Arrangement
BASARNAS	National Agency for Search and Rescue / Badan SAR (Sarch and Rescue) Nasional
BAPPENAS	Development Planning Agency / Badan Perencanaan Pembangunan Nasional
BIG	Geospatial Information Agency / Badan Informasi Geospasial
BMKG	Agency of Meteorology, Climatology and Geophysics / Badan Meteorologi, Klimatologi, dan Geofisika
BNPB	National Disaster Management Agency / Badan Nasional Penanggulangan Bencana
BPBD	Regional Disaster Management Agencies / Badan Penanggulangan Bencana Daerah
BPPT	Agency for the Assessment and Application of Technology / Badan Pengkajian dan Penerapan Teknologi
CA	Cooperation Agreement
CAP	Common Alerting Protocol
CBS	Cell Broadcast Service
CMS	Content Management System
CPU	Central Processing Unit
DB	Data Base
DIBI	Data dan Infromasi Bencana Indonesia
DMC	Disaster Management Center
DMIS	Disaster Management Information System
DR	Disaster Recovery
DRR	Disaster Risk Reduction
EIA	Electronic Industries Alliance
EOC	Emergency Operation Center
E/N	Exchange of Notes
ESDM	Ministry of Energy and Mineral Resources
FGD	Focus Group Discussion
G/A	Grant Agreement
GB	Giga Byte
GDP	Gross Domestic Product
GIS	Geographic Information System
GITEWS	German Indonesia Tsunami Earthquake Early Warning System
GNI	Gross National Income
GNP	Gross National Product
HDD	Hard Disk Drive
HF	High Frequency
H/W	Hardware
Hz	Hertz
IBP	Indonesia Broadband Plan
ICT	Information and Communication Technology
IIX	International Internet Exchange
IDR	Indonesian Rupiah

Abbreviations	English / Bahasa indonesia
InaTEWS	Indonesia Tsunami Early Warning System
InAWARE	Indonesia All-hazards Warning and Risk Evaluation
IP-VPN	Internet Protocol Virtual Private Network
iSCSI	Internet Small Computer System Interface
JICA	Japan International Cooperation Agency
KEMLHK	Ministry of Environment and Forestry / Kementerian Linkugan Hidup dan Kehutanan
KOMINFO	Ministry of Communication and Information Technology / Kementerian Komunikasi dan Informatika
LBS	Location Based Service
M	Magnitude
MA	Mutual Agreement
M/D	Minutes of Discussion
MDGs	Millennium Development Goals
MoU	Memorandum of Understanding
NAS	Network Attached Storage
NIX	Nusantara Internet Exchange
OS	Operating System
OSS	Open Source Software
PDC	Pacific Disaster Center
PDM	Project Design Matrix
PHKA	Forest Protection Agency / Perlindungan Hutan dan Konservasi Alam
PU	Ministry of Public Works / Departemen Pekerjaan Umum
PVMBG	Volcanological and Geological Disaster Mitigation Center / Pusat Vulkanologi dan Mitigasi Bencana Geologi
SDGs	Sustainable Development Goals
SMS	Short Message Service
SNS	Social Networking Service
SOP	Standard Operation Procedure
SQL	Structured Query Language
S/W	Software
TB	Tera Byte
TOR	Terms of Reference
UHF	Ultra High Frequency
USAID	United States Agency for International Development
USB	Universal Serial Bus
USF	Universal Service Fund
USGS	U.S. Geological Survey
USO	Universal Service Obligation
UTC	Universal Time, Coordinated
V	Volt
VGA	Video Graphics Array
VHF	Very High Frequency
VSAT	Very Small Aperture Terminal

Chapter 1 Background of the Project

Chapter 1 Background of the Project

1-1 Background and Outline of Grant Aid

In Indonesia, many kinds of disasters have occurred such as earthquakes and tsunamis, floods, landslides, volcano eruptions, storms and so on. According to statistics from 1980 to 2014, more than 190 thousand people were killed, 22.31 million people experienced damages to their properties and 23.7 billion US Dollars of economic damages were caused due to disasters.

In 2011 and 2012, the Ministry of Internal Affairs and Communications of Japan conducted a research study to apply Japanese ICT infrastructure to disaster management and prevention in Indonesia and to consider systems and specifications to strengthen and promote the disaster management and prevention field in the country. Based on the results of the research study, a Minutes of Meeting (M/M) was exchanged between the Minister of Internal Affairs and Communications of Japan and KOMINFO on April 29, 2013, which stated the necessity of the system, as well as the necessity to realize the development and construction of the system for disaster management by using ICT. In addition, a Minutes of Discussion (M/D) were exchanged between the Ministry of Internal Affairs and Communications of Japan and three parties of Indonesia, namely KOMINFO, BMKG and BNPB.

Subsequently, KOMINFO submitted a written request for "ICT disaster management systems" on August 15, 2013 and the preparatory survey was carried out in August 2014. The request from KOMINFO at that time was for provision and procurement of the central system and its equipment, procurement of equipment and technical assistance for the related government organizations, mass media and others, as shown in the below table:

Table 1-1: Contents of the request from KOMINFO

Item		Recipient	Quantity
Equipment Procurement	Center System	KOMINFO	1 unit
	Area Control System	BPBD	1 unit
	Operation Terminal	BNPB	1 unit
	Operation Terminal	BPBD	1 unit
	Transmitter and Disaster Information Receiving Units	KOMINFO	1 unit
	Transmitter for Radio Speaker System	BPBD	1 unit
	Transmitter for TV Broadcasting	TBC	1 unit
	Transmitter for Multiple Media	BPBD	1 unit
	Rural Area Option of Transmitter for Multiple Media	BPBD	1 unit
	Transmitter for Service Delivery Platform	TBC	1 unit
Soft Components	* Establishment of Disaster Management Plan * Small Drills using system Workshop	KOMINFO	1 unit

1-2 Natural Conditions

Indonesia is an archipelago country, located between two continents of Asia and Australia, and between the two oceans, the Indian and the Pacific. The archipelago is stretched from Ache in the Sumatra Island in the west end up to Papua Balat in the Papua Island in the east, approximately 5,100 km in its entire length,

making it the largest archipelago country in the world. The total area of the country is 1,920,000 km^2, which is about 5.5 times larger than Japan and the country consists of about 14,000 islands of various sizes. Out of all islands, residents reside only in about 3,500 islands.

The geo-topological feature of the archipelago can be characterized with two mountainous ranges. One range stretches from the Philippines in the north, through Kalimantan, to the eastern part of the country. The other extends from the Burma Mountains of the continent, through the west coast of the Sumatra, Java, and Bali islands and then leads to Sulawesi Island. The archipelago belongs to the Pacific Ring of Fire and consists of 128 volcanoes, out of which 78 volcanoes are active.

The country is located in the vicinity of the equator and the climate can be classified as the oceanic tropical monsoon climate and generally have two seasons; the dry season from April to September and the rainy season from October to March. The temperature change throughout the year is generally small

Average temperatures and precipitations of Indonesia's main cities are shown below:

Table 1-2: Average temperatures and precipitation from 2011 to 2015

Province	Average temperature	Average maximum temperature	Average minimum temperature	Average annual rainfall
Jakarta	28.7℃	32.1℃	26.0℃	1,966.0 mm
Bali	27.4℃	30.5℃	24.6℃	1,724.0 mm
Sumatera Utara	27.5℃	32.2℃	23.8℃	2,194.2 mm
Kalimantan Timur	27.5℃	31.2℃	24.7℃	2,695.2 mm
Sulawesi Selatan	27.2℃	32.5℃	23.0℃	3,243.4 mm
Papua	27.5℃	32.1℃	24.0℃	2,691.1 mm

Data from Japan Meteorological Agency

Disaster risk profiles of the main cities are shown below:

Table 1-3: Natural disaster risks of main cities

Province	District	Earthquake	Tsunami	Flood	Volcano	Land slide	Extreme Weather	Total
Jakarta	Jakarta Center	11	6	34	0	11	7	69
Bali	Denpasar	22	24	0	0	12	14	72
Sumatera Utara	Kota Medan	22	0	36	0	12	14	84
Kalimantan Timur	Balikpapan	11	16	35	0	12	14	88
Sulawesi Selatan	Makassar	11	24	12	0	12	14	73
Papua	Jayapura	32	16	36	0	36	7	127

Data from Indeks Risiko Bencana Indonesia 2013, BNPB

Risk index for each disaster : Low(0-4) , Moderate (5-15), High (16-36)

The following issues shall be considered when the project system and equipment are installed:

- Project system equipment must be installed in data centers with tough measures in place against earthquakes in Denpasar, Medan and Jayapura, as those cities show high earthquake risks,
- The equipment must be installed in data centers located outside the expected tsunami inundation areas in Denpasar, Balikpapan, Makassar and Jayapura as those cities show high tsunami risks.
- The heightsof floors where servers, generators and backup systems in data centers are or will be installed shall be carefully considered in Central Jakarta, Medan, Balikpapan and Jayapura because those cities show high flood risks,

- The equipment shall be installed in data centers away from cliffs in Jayapura because the city shows a high landslide risk,

The Cyber Building, the current candidate data center for the installation of the system server group in Jakarta, is located at a higher elevation, 7 m than road surface (at 12 m above the sea level), and there is no risk of inundation by flood. In addition, Nusantara Internet Exchange (NIX) Bali, which is the candidate data center in Bali, is located outside the expected tsunami inundation area and the toughness of the building to earthquakes also has been confirmed. The Cyber Building and NIX Bali are determined to be suitable as server installation locations because overall natural disaster risks in these two cities are assessed as low compared with other major cities and the two buildings have been considered tobe prepared to disasters fairly effectively.

1-3 Environmental and Social Considerations

1-3-1 Environmental Impact Evaluation

This project falls into category C in the GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS, which means that there is no significant impact to the environment. It is assumed that the equipment (servers and other miscellaneous) to be procured in the Project be installed in the Cyber Building and NIX Bali. The Cyber Building is a data center operated and managed by a private company and NIX Bali is a regional data center to provide the Internet connection environment which has been developed under the Indonesia Broadband Plan (IBP), which is one of the Government development plans. Both buildings are existing facilities and thus construction work for new facilities will not occur.

1-3-2 Land Acquisition and Resettlement

In the implementation of the Project, operations for land acquisition and resettlement will not occur.

1-3-3 Other Issues

There is no other issue of note regarding environmental and social considerations.

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Outline of the Project

2-1-1 The Target of the Project

The Disaster Management Information System (hereinafter referred to as DMIS), planned to be set up by the Ministry of Communication and Informatics (KOMINFO), is a system aiming to acquire early warning information about tsunamis and earthquakes, extreme weather events, floods, forest fires, volcanic eruption and so on, from disaster information monitoring organizations such as the Agency of Meteorology, Climatology and Geophysics (BMKG), the Ministry of Public Works (PU), the Ministry of Environment and Forestry (KEMLHK) and the Volcanological and Geological Disaster Mitigation Center (PVMBG), and to distribute the information rapidly and reliably to the related government organizations, mass media, and telecommunication carriers.

In order to implement DMIS, KOMINFO has already embarked to form agreements with the relevant organizations. For example, the agreement with BMKG regarding the utilization of their early warning disaster information for KOMINFO's DMIS was signed in May 2015. Moreover, KOMINFO has stated in their Strategic Plan (2015- 2019) their intent to realize DMIS from 2015 to 2019. In the Plan, 2015 is also described as the year for the preparation of the system implementation, and years 2016 to 2019 as the active period to establish DMIS to receive and transmit early warning information to relevant organizations.

In this circumstance, this project will install the system equipment of computer servers and to develop system for disaster information communication, as a part of DMIS activities to be implemented by KOMINFO. The Project aims to transmit early warning information concerning earthquakes and tsunamis (hereninafter referred to as earthquake and tsunami information) rapidly and surely to the related government organizations, mass media, and telecommunication carriers.

2-1-2 Outline of the Project

The Project will procure the equipment which can be categorized under Hardware, Purchased software and Developed software, which will be used to transmit earthquake and tsunami information monitored by BMKG to the National Disaster Management Agency (BNPB), the Regional Disaster Management Agencies (BPBDs), mass media, telecommunication carriers and others, and also to provide it to KOMINFO, which is the main administrative organization in charge of Information and Communication in Indonesia. Technical cooperation, as a Soft Component, is also included in Project activities. Through the Soft Component, KOMINFO will be able to appropriately provide earthquake and tsunami information; BNPB, BPBD, mass media and telecommunication carriers will be able to receive and utilize the information, and KOMINFO will be able to disseminate the information on how to appropriately utilize earthquake and tsunami information transmitted by the Project system.

2-2 Outline Design Drawing of the Project

2-2-1 Design Policy

(1) Basic plan

The DMIS promoted by KOMINFO is one of the important activities to strengthen infrastructure concerning disaster information communication, which is described in the KOMINFO Strategic Plan (2015-2019). The plan has been developed based on a policy to promote the information and telecommunication as one of the prioritized items in the government policies. The DMIS aims to transmit early warning information by means of receiving the information from the disaster information monitoring organizations and transmitting it to the related government organizations and mass media, telecommunication carriers and so on. In the DMIS, KOMINFO's role will be to provide the infrastructure for information communication to transmit the early warning information from the disaster information monitoring organizations to the related government organizations and others. The specific activities defined as its roles are as follows:

- To examine the technical method to achieve disaster information communication and to provide the necessary legal background for it
- To organize and demarcate roles among the related government organizations, mass media and othres
- To provide a Data Center for disaster information management
- To possess strong coordination for operating the Data Center

As described above, KOMINFO's role is crucial and it is very important to provide the equipment for disaster information communication in the country.

Further, it is required that BNPB and BPBD, as disaster management organizations, are able to receive the transmitted information from the Project system with certainty, and make appropriate decisions for disaster management activities. Telecommunication carriers must also disseminate earthquake and tsunami information with certaintly, reaching the residents in the last mile of delivery.

KOMINFO is currently implementing and managing information communication servers equipped in the Cyber Building, which are utilized for implementing e-Government, operated by private companies under contract with KOMINFO. Accordingly it is considered that KOMINFO have enough experience and know-how to manage information and communication systems, although it has no experience and knowledge in managing systems by which rapid and certain information transmission is required, such as earthquake and tsunami information. They also have no experience to guide and monitor recipient organizations to build up their system structures to both reliably receive the information and to reliably utilize the information in their activities (such as computer monitoring).

With the above understanding, the objectives of the Project are set up as follows:

- To procure the equipment for information communication (main server group and the backup server group),
- To develop and provide a disaster information communication system,
- To support KOMINFO staff in technical capacity building (Soft Component)

Implementation of this Project will strengthen the communication system for earthquake and tsunami information by means of complementing and promoting KOMINFO's DMIS.

(2) Policy on location to install project equipment

As the equipment to be procured in the Project is precision machinery and will be utilized for transmitting earthquake and tsunami information during disaster events, the locations and buildings housing the equipment for the system must be strong and safe, able to withstand earthquakes and other disasters. Data Centers are therefore planned to be utilized to install the Project equipment, as such facilities can supply the most reliable and satisfying conditions for the equipment in terms of: building structural specifications, equipment and facilities, management and maintenance, fire extinguishing facilities, security conditions, emergency power supply, availability of electrical power for the equipment, available rack space for the equipment, and so on. From the field survey, the Cyber Building in Jakarta and NIX Bali in Bali are considered suitable locations to install the Project equipment because those buildings satisfy the above mentioned conditions and many government related agencies, ministries and telecommunication carries have been utilizing the buildings as their server locations.

In both buildings, the firewall to maintain network security and the load balancer for leveling the processing load with plural equipment has already been provided. Also it can be expected that the Project system will be managed effectively and efficiently as other government servers have been located and managed centrally in these buildings. Accordingly, the main server group shall be installed at Cyber Building in Jakarta and the backup server group shall be installed at NIX Bali in Bali.

(3) Policy on socio-economic conditions

In Indonesia, the environment for telecommunication is well-developed. It is especially evident in the mobile phone penetration rate, which is 1.25 units /person (2013)[1] and very high level. Furthermore, the awareness of the importance of disaster information has been growing more than ever from many experiences of natural disasters. Moreover, KOMINFO, BMKG and one of the main telecommunication carriers, Telekom Indonesia, have been implementing a verification experiment on Short Message Service (SMS) broadcast function using Location Based Service (LBS) for disaster information communication in Yogyakarta, Bandung and Gambir. These examples show that the environment to disseminate information to mobile phone users have been developed well in Indonesia. Due to these conditions of the country, the Project system has been specified to include the function to distribute early warning information from telecommunication carriers to residents through mobile phones.

(4) Policy on procurement

In terms of disaster information communication, this Project requires the system to not only transmit early warning information to designated multiple parties rapidly and reliably, but also to observe the situations of communication at recipients and note whether or not they receive the information; when the information transmission is delayed or bounced, the system is required to execute a complementary action. It is therefore necessary to develop tailor-made software for the Project system that will satisfy the above functional requirements, because there is no commercial software to meet with all above functions.

[1] ITU World Telecommunication/ICT Indicators database, 2014

In Japan, “Disaster Information Common System (L-Alert)” has been developed and will be adapted to nationwide use as part of the initiative by the Japanese Ministry of Internal Affairs and Communications. The L-Alert is an information infrastructure for the transmission of public information relating to the safety and security, which chiefly concerns disaster information, rapidly and accurately. L-Alert will transmit public information, to all regions at the same time without any consideration of data types, from information issuers toward information transmitters who convey the information to the residents. The design concept of L-Alert includes the technical superiority regarding the reliability of information transmission, broadcast properties and the future scalability. The software of the Project therefore shall be procured from Japan by referencing to the design concept of L-Alert, especially in the data distribution function of the system, with the sufficient care of the intellectual property rights of L-Alert.

Further, the hardware shall be also procured from Japan in order to shorten the working period of overall system development, so that developing the software and confirming the software operation in the hardware can occur concurrently.

(5) Policy on operation and maintenance management

The equipment to be procured under the Project is required to be operated and maintained by KOMINFO appropriately and continuously. As described in previous sections, KOMINFO currently have their own servers for information communication installed in the data centers and have been operating and maintaining the servers through private companies on a subcontract basis. The Project shall take the same modus operandi, which means that the equipment to be procured by the Project shall be installed in the Cyber Building and NIX Bali and that the equipment shall be operated as well as maintained by private companies on a subcontract basis with KOMINFO.

To ensure that the Project system can receive spare parts and after-sale services without any delay, the equipment shall be selected from manufacturers who have local agents in Indonesia.

(6) Policy on the scale and grade of the equipment

The Project aims to straight for wardly transmit early warning information issued by BMKG to the related government organizations, mass media and others; transmission of decision information such as an evacuation order is not included in the Project scope. Therefore, the system equipment to be procured under the Project shall be of simple design to specialize in early warning information transmission with a scale and grade that enables easy operation and maintenance. It shall be noted that the Project will engage with disaster information that affects human lives and that the Project system shall be operational around the clock, 24 hours a day, 365 days a year, and should function for more than 99.5% of the operation time.

It should be noted that the Project has been planned based on the concept of DMIS and the targets of DMIS include disaster information types other than earthquakes and tsunamis, such as floods, meteorological disasters and forest fires. It therefore shall be considered in the Project to secure scalability towards the ability to include other disaster information types in the future.

(7) Policy on procurement methods and construction period

Equipment procurement in the Project shall be tendered under general competitive bidding open to Japanese companies in accordance with Japanese Grant Aid policies. The time required for producing the

equipment, for transportation, for various procedures, for installation work, for initial operation guidance and for inspection of the equipment by both Project and Indonesian sides shall be considered as the Project period.

(8) Policy on the scope of the Project

1) Disaster types to be dealt with in the Project

Early warning information about earthquakes and tsunamis shall be targeted as the disaster types to be dealt with in the Project, as the information communication on these types of disasters require immediacy and certainty for information transmission more than any other type of natural disaster. However, the system equipment is planned, in the future, to be used for other types of disasters such as volcanic eruptions, floods and forest fires, according to DMIS. Therefore the system equipment configurations and specifications will be designed to be capable for those disaster types to be added later, in terms of the capacity of servers and supplemental equipment.

2) Disaster information to be dealt with in the Project

Disaster management information can be classified into three types, “Early Warning Information (Disaster information)”, “Evacuation Warning Information” and “Damage Information”. Among these, the scope of the Project is early warning information issued by, and transmitted from, disaster information monitoring organizations. This is consistent with the DMIS concept in which early warning information is targeted. Evacuation warning information requires decision making and damage information requires situation analysis by specialized agencies. Accordingly these latter two types of information shall be out of the Project scope to avoid the confusion of jurisdiction among governmental agencies.

Table 2-1: Classification of disaster management information

Classification	Information dissemination organization		Scope of the Project
Early warning information	Disaster information monitoring organization	BMKG, PU, KEMLHK, PVMBG	○
Evacuation warning information	Disaster management organizations	Local government, BNPB, BPBD	
Disaster damage information	Disaster management organizations	BPBD	

3) Procurement scope

The scope of procurement by the Project is the equipment necessary to establish and introduce a disaster information communication system, which includes equipment for fulfilling the functional requirements of the acquisition of early warning information about earthquakes and tsunamis issued by and transmitted from BMKG, classifying, storing, and then transmitting the information. Preparation of the network environment between servers and/or management and operation of the environment shall not be included in the Project scope, and it is understood that the implementing agency on the Indonesian side is responsible for the preparation of the environment.

4) Disaster information to be accumulated in the Project

Information treated and accumulated by KOMINFO in the Project system shall be the information transmission log, generated in the process of information transmission. Disaster information itself, issued by BMKG, shall be stored and accumulated by BMKG; damage information will likewise be stored and accumulated by BNPB, and these shall thus be out of the Project scope.

Table 2-2: Disaster related information each agency to be accumulated

	BMKG	KOMINFO	BNPB
Data storage	Disaster information	Information transmission log	Disaster damage information
Scope of the Project		○	

5) Destinations of information in the Project system

All agencies that BMKG is currently providing tsunami and earthquake information for shall be included as destinations of information transmitted by the Project system. In addition, telecommunication carriers that are not currently providing early warning information to the general public shall be also included as destinations. By doing so, the information transmission to mobile phone users can be expected.

Information destinations transmitted from the Project system are shown in the bellow table:

Table 2-3: Destinations for information transmitted thorough the Intra-Web

Area	Central government	Local government	BPBD	Military	Police	Total
Region 1	37	160	168	160	160	685
Region 2	0	154	162	154	154	624
Region 3	0	55	61	55	55	226
Region 4	0	75	79	75	75	304
Region 5	0	63	64	63	63	253
Total	37	507	534	507	507	2,092

Unit: Number of destinations

Table 2-4: Destinations for information transmitted through the Internet-Web

Area	Population (2010)	Population in areas of high inundation risk		Web views *
		Ratio	Area population	
Region 1	149,685,386	0.8%	1,257,335	2,506,792
Region 2	50,630,931	1.3%	681,639	883,842
Region 3	13,787,831	0.0%	0	214,677
Region 4	17,371,782	4.7%	821,680	385,621
Region 5	6,165,396	3.1%	193,428	123,100
Total	237,641,326	1.2%	2,954,082	4,114,031

* Calculation by internet spread (2014) and smart phone spread (2009) *Unit: Number of Web access

Table 2-5: Destinations for information by data transmission

Area	TV station	Radio station					Telecommunication carrier *	Total
		FM		AM (MW)	Shortwave (SW)	Total		
		RRI*2	Commercial					
Region 1	106	22	1,128	119	1	1,270	6	1,382
Region 2	71	23	500	27	1	551	0	622
Region 3	27	11	207	12	0	230	0	257
Region 4	23	7	207	21	3	238	0	261
Region 5	11	16	65	17	5	103	0	114
Total	238	79	2,107	196	10	2,392	6	2,636

* Telecommunication carriers will be newly added by this Project as destinations of information transmission

*2 RRI means "Radio Republic of Indonesia" Unit: Number of destinations

At present, data transmission by SMS has been done to individuals in disaster management organizations and government related agencies. This data transmission is via the telecommunication carriers though the data

have not been transmitted from the carriers to the general mobile phone users. The number of final information recipients reached by the Project system can be expected to increase substantially by adding telecommunication carriers as information destinations since carriers in turn will be able to transmit information onwards to their mobile phone users (the residents). This is partly because responsibility of telecommunication carriers for disaster information transmission will be more clarified by the KOMINFO Minister Decree to be issued soon.

Table 2-6: Expected number of mobile phone users to receive the information from the Project system

Area	SMS	SNS (Twitter etc.)	Total
Region 1	187,705,474	2,506,792	190,212,266
Region 2	63,491,187	883,842	64,375,029
Region 3	17,289,940	214,677	17,504,617
Region 4	21,784,215	385,621	22,169,835
Region 5	7,731,407	123,100	7,854,507
Total	298,002,223	4,114,031	302,116,254

* Number of receivers are calculated by mobile phone spread (2013) etc. Unit: Number of destinations

(9) Policy for adding other disaster types

It is expected that the Project will play an integral part of DMIS and that the Project system be utilized effectively in the future for transmitting all kinds of early warning information originating from disaster information monitoring organizations. Therefore, it is necessary to set a common format for early warning information, and for all disaster information monitoring organizations to issue information in data compliant format to the Project system.

In the KOMINFO ministerial decree to be issued in the near future, it is expected that a clause about unifying the data format for disaster information communication will be included.

With this expectation, the equipment specification of the Project is planned with the ability to add additional disaster types into the System in the future.

2-2-2 Basic Plan (Equipment Plan)

2-2-2-1 Project Overall Plan

In this Project, Disaster Management Information System shall be established. It can be expected that early warning information will be transmitted rapidly and reliably by the system. The system shall consist of a main server group and a backup server group, and the main server group shall be functionally divided into the “Transmission Server” part and the “Processing and Management Server” part.

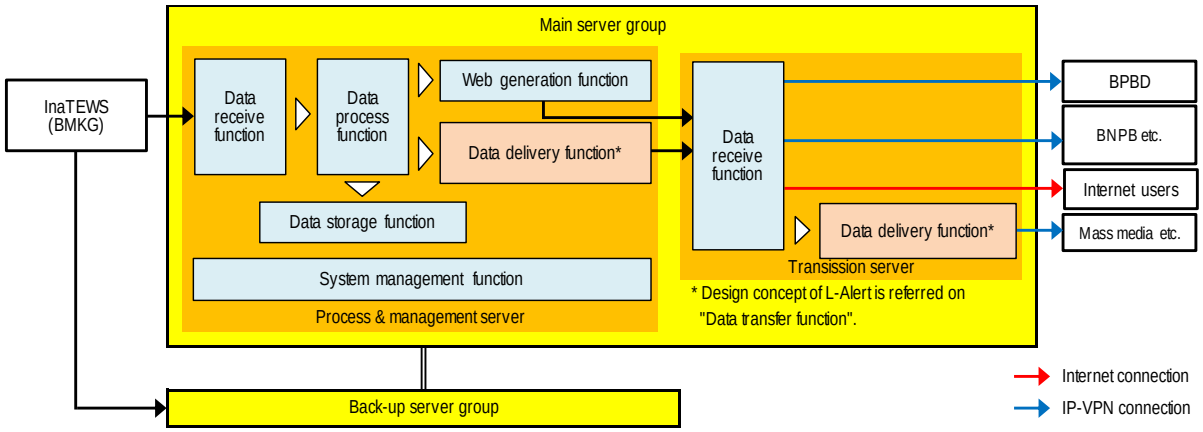


Figure 2-1: Project system configuration

The Project system will be configured to transmit early warning information received from BMKG to the related government organizations, mass media and others rapidly and reliably. In addition, the situation of communication at recipient agencies will be monitored as to whether or not they receive the information, and when the information transmission is delayed or bounced, the System will function to allow KOMINFO and BNPB to implement the complement treatments for the malfunction.

2-2-2-2 Needs and Roles of Servers

(1) Main server group

1) Processing and management server

In order to fulfill the objectives of the Project system, the system needs functions to receive early warning information of earthquakes and tsunamis, issued by BMKG, and to transfer, analize and generate data according to the information, and then transmit rapidly and reliably to the designated destination. It is also necessary to generate a web page rapidly in the system, since it is also planned to provide the information through a Web connection in order to distribute the information to disaster related organizations and the residents. Further, from the viewpoint to secure redundancy in the system, data backup and synchronization of data is necessary.

The Processing and management server is a server to fulfill these functional requirements and a more detailed list of the main roles of the server can be described as follows:

- Collecting early warning information from Indonesia Tsunami Early Warning System (InaTEWS) operated by BMKG, as well as other early warning information systems (Data Reception Function)
- Classifying data by disaster types, time information such as estimated arrival time and occurrence time, regions and so on (Data Processing Function)
- Generating web contents and transmitting the information (Web Generation Function)
- Storing information and data (Data Storage Function)
- Confirming the transmission conditions of early warning information (System Management Function)
- Management of the entire system (System Management Function)
- Synchronizing periodically with the backup server group (System Management Function)

- Transmitting data to the transmission server (Data Distribution Function)

2) Transmission server

The transmitting server is intended to transmit data generated by the processing and management server to the relevant transmission destinations. The importance of the server is high during system operation.

The main roles of the transmission server are as follows:

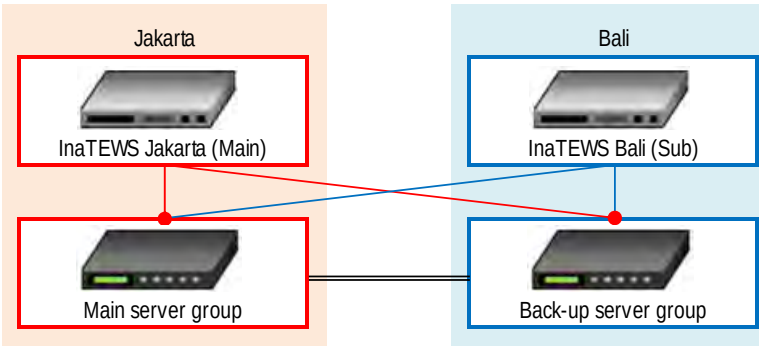
- Receiving the data of early warning information transmitted from the processing and management server (Data Reception and Strage Function)
- Transmitting the data to transmission destinations (Data Distribution Function)

On top of the above, considering the redundancy of the system and adding disaster information types other than earthquakes and tsunamis to the system in the future, advantages to install the transmission servers in the center of the system in Jakarta and in local regions were examined in the survey (The details are to be mentioned section 2-2-2-4).

(2) Backup server group

As one of the scopes of the Project is to transmit early warning information during the occurrence of disasters, it must be sure that the system will be operational even during disasters. At present, the main server group is planned to be installed in Jakarta. The reception of early warning information from BMKG and transmission of the information from the system to the designated destination must occur even if Jakarta is affected by a disaster and the main server group in Jakarta becomes inoperable. To achieve this, the installation of a back-up server group for the Project system has been considered.

The main and sub-systems of InaTEWS, which provides early warning information, are currently placed in Jakarta and Bali respectively. By connecting the Project system with both InaTEWS in Jakarta and Bali, the redundancy in the event of a disaster will be further strengthened. In other words, the need for the backup server group is high in order to ensure the redundancy of the system.



* Each InaTEWS and each server group are connected by IP-VPN.

Figure 2-2: Image of connection of each server group

2-2-2-3 Functional Requirements of Each Server

(1) Processing and management server (the main server group)

1) Data reception function

Reception processing

Functional requirements for the reception processing function are as follows:

- Can request re-transmitting of early warning information to InaTEWS in case the information received by the system is unusable.
- Can transmit an alarm from KOMINFO to BMKG by using the system management function in case early warning information has been received, but was found unusable, after a period of three minutes has passed after the reception.
- Can store received early warning information temporarily in the system. The retention period of can be arbitrarily set up through the system management function.

Manual input processing

Functional requirements for the manual input processing function are as follows:

- "Information on Hypocenter", "Tsunami Arrival Time" and "Tsunami Wave Height" can be manually inputted into the system in case of transmission failure from BMKG..

Training processing

Training function is classified as "training to confirm the information transmission status" and "training to raise awareness of disaster management to effectively utilize the received information for appropriate disaster management activities". Earthquake and tsunami information for the training will be transmitted under the control of KOMINFO based on the original judgment of the BNPB because the training activities are under the jurisdiction of the BNPB.

Functional requirements for the training processing function are as follows:

- Tusnami and earthquake information for a System Operation Drill can be inputted in the system to implement the drills by disaster management organizations such as BNPB and BPBD, mass media and telecommunication carriers.
- The status of the current communication being part of a drill is clearly displayed on the screen in order to inform related parties about the situation.
- Mock events of transmission failure for the drills can be generated in the system.
- During the System Operation Drill for BNPB, the screen of BNPB's terminal system should be able to display the transmission situation at the recipient side such as BPBDs, and reflect situations where some of the recipients cannot receive the information. Since the drill for BNPB will be aimed to train BNPB staff how to correspond to transmission failure situations, the above information for BNPB in the drill should not be transmitted to BPBD, mass media, telecommunication carriers and others.
- For the System Operation Drill for BPBD, the system should only transmit hypocenter, Tsunami Arrival Time and Tsunami Wave Height information, to BPBD, whereupon transmission destination

organizations can be specified and set up in the system. The information for BPBD be should not transmitted to the mass media, telecommunication carriers and others.

2) Data processing function

Data selection processing

Functional requirements for the data selection processing function are as follows:

- The SMS and Common Alert Protocol (CAP) data among the data received from InaTEWS can be focused on, decoded and sorted out as output data according to element factors, such as disaster types, times, regions and so on.
- Regional name data can be generated from SHAPE format map data, which is used in InaTEWS, and updating of data – such as the attribute Regional Names and dividing the regions in the data and so on – can be easily performed.
- Data output can be performed based on element factors such as Island Names, Province Names, City Names, District Names, alarm levels, disaster type and so on.
- Information data can be encoded in the system in order to realize rapid sort-out processing.

Output processing to data storage function sector

Functional requirements for the output processing for data storage function are as follows:

- The data sorted out and coded can be outputted to the data storage function sector.

Output processing to data distribution function sector

Functional requirements for the "data output processing to distribution function sector" function are as follows:

- The information in the following table can be generated from the data sorted out and coded in order to transmit to the transmission server group.
- Data can be compressed as small as possible in order to distribute by XML format file.

Table 2-7: Generated information

Type of information	Contents
Hypocenter information	Earthquake occurrence time, Information announcement time, Number of announcement, Magnitude, Epicenter depth, Longitude, Latitude, Area name etc.
Tsunami arrival time	Tsunami arrival time, Earthquake occurrence time, Information announcement time, Number of announcement, Island name, Area name, Arrival time etc.
Tsunami wave height	Earthquake occurrence time, Information announcement time, Number of announcement, Island name, Area name, Wave height etc.

3) Web generation function

Web content generation

Functional requirements for the Web content generation function are as follows:

- Both the Intranet contents for system operation and the internet contents open to the public can be generated from the transmitted data.

- System times of the data can be converted from Universal Time, Coordinated (UTC) to local times.
- The contents in the following table can be generated, displayed and updated on browser software.

Table 2-8: Contents to be displayed on the Web

● Map of earthquake location *	● Map of tsunami arrival time for specific area
● Location of earthquake expressed in words	● Tsunami arrival time expressed as list for specific area
● Map of warning announcement area *	● Map of tsunami wave height *
● Warning announcement area expressed as list	● Tsunami wave height expressed as list
● Map of warning announcement for specific area	● Map of tsunami wave height for specific area
● List of warning announcement for specific area	● List of tsunami wave height for specific area
● Map of tsunami arrival time *	● List of search result of earthquake and tsunami
● Tsunami arrival time expressed as list	● Detail of search result of earthquake and tsunami

* WebGIS is utilized for Intranet connection.

- Map displayas part of the Intranet content shall be performed by using Web GIS.

Intranet distribution

Functional requirements for Intranet distribution are as follows:

- Early warning information can be distributed by the transmission server through the intranet web based on the communication environment configured with IP-VPN connection.
- A window pops up as soon as early warning information is received, so that recipients will be able to notice the incoming information and then issue an alarm to the public.
- A confirmation button will be provided on the window in order to notify and confirm reception.
- The confirmation information can be generated in case reception is confirmed as above. A symbol to show that reception confirmation has been made can be displayed on the screen, for the recipient side to to monitor their reception status, as part of the system management functions in the main server group.

Internet distribution

Functional requirements for Internet distribution are as follows:

- Early warning information can be distributed through the internet web.

4) Data distribution function

Functional requirements for the data distribution function are as follows:

- The generated early warning information can be transmitted to the transmission server.
- The transmission destinations can be set up by the system management function.
- The transmission orders of the destinations can be set up in accordance with the priority of the information. Higher the priority of the information is, the faster the transmission order of the data is.
- The data log to record the information transmission status can be generated.
- Information transmission status can be referenced by the system management functions.
- In case the transmission is delayed more than a certain time, assumingly about 2 minutes, a warning can be alerted and contact persons in the organizations related to the unusual transmission situations can be displayed.
- The capacity of the transmission function shall be enough for the scalability to cope with disaster types

in the future other than earthquake and tsunami.

5) Data storage function

Functional requirements for the data storage function are as follows:

- Data records, such as early warning information transmission data, transmission status log data, BPBDs' access records to refer to the transmission server and so on, can be accumulated in the database.
- UTC shall be used as the system time configuration.
- The data can be stored and accumulated for more than 20 years.
- The same information can be sent and stored in the main server group in Jakarta and the backup server group in Bali.
- The contents of the data in the main server group and the backup server group can be compared and synchronized in the database.
- In the synchronization of data between the two databases, the database in the main server group shall be the primary and the one in the backup server group shall be synchronized with the main server.
- The frequency of the synchronization can be set up by the system management functions.
- The interval of the synchronization can be set up in units of one day. The default value for the interval shall be once a day.
- The time of the synchronization can be set up by the system management functions.
- The default time of the synchronization shall be at 2:00 AM at night.
- The log of synchronization of the two databases can be stored in both databases, in the main server group and the backup server group.
- Data of the database in the backup server can be utilized for the restoration of the database in the main server group in case a failure occurs in the main server group.
- Open Source Software (OSS) such as Postgre SQL or other similar OSS shall be utilized for database development.

6) System management function

Functional requirements for the system management function are as follows:

- The system can be operated from the terminal computers installed in KOMINFO and BNPB.
- KOMINFO can monitor all operations in the entire system. BNPB can monitor BPBD's situation regarding transmission of early warning information.
- The early warning information record can be sorted and searched through category factors such as time, alarm levels, disaster types, regions and others.

More information about the system management functions is shown in the following table:

Table 2-9: System management functions

Item	KOMINFO	BNPB	Contents
Operation menu	○		Menu screen for manager
Password input	○	○	Password input
List of server operation condition	○		List of server operation condition by chronological order
● Server operation condition (Log)	○		Indication of system log of each server
● Server operation condition (Security)	○		Indication of security log of each server
● Server operation condition (OS up-date)	○		Indication of OS up-date condition of each server
● Server operation condition (AP)	○		Indication of version of developed software of each server
● Server operation condition (Disk)	○		Indication of disk utilizing condition of each server
● Server operation condition (Memory)	○		Indication of memory utilizing condition of each server
● Server operation condition (Resource)	○		Indication of resource utilizing condition of each server
● NAS operation condition	○		Indication of NAS operation condition including fiber channel
List of data base condition			
● List of operation condition	○		Symbol indication of data base operation condition by chronological order
● List of data storage condition	○		Graph indication of total volume of storage data by chronological order
● List of data base setting	○		Indication of data base setting condition
● Data base search function	○	○	Indication of search result of stored information in data base
List of Web server condition			
● List of operation condition	○		Symbol indication of NAS server operation condition by chronological order
● List of access condition	○	○	List indication of access condition
● Monitoring of transmission condition of early warning information	○	○	List indication of confirmation condition for transmission early warning information
● List of utilized browsers	○		List indication of access browser type
● List of Web server setting	○		Indication of Web server setting condition
● Error list	○		Indication of error occurrence condition
○ Error indication	○		Indication of error information
Communication line condition	○		List and graph indications of network operation condition
● Load information of communication line	○		Information indication of specific equipment for traffic load
System operation management menu	○		Graph image expression with server and time
● Communication condition management	○		List indication of communication condition
○ Communication condition information	○		Result indication of trace route of poor communication condition
● Transfer condition management	○		List indication of confirmation condition for transmit
○ Transfer condition information	○		Result assumption of trace route of poor communication condition
Destination edit function	○		
● Edit of type of delivery information	○		Edit, addition and delete of destination information
● Edit of destination	○		Setting of sender, receiver and priority of delivery on each information
User password	○		
● User password edit	○		Addition, edit and delete of user password
● User password history indication	○		History indication of addition, edit and delete of user password
○ Specific user history indication			Indication of change history of specific user by chronological order
Up-date	○		
● OS up-date management	○		List of up-date condition
○ OS up-date implementation	○		Up-date remote processing
● Purchased software up-date management	○		List of up-date condition
○ Purchased software up-date implementation	○		Up-date remote processing
● Pattern file up-date management for security software	○		List of up-date condition
○ Pattern file up-date implementation	○		Up-date remote processing
● Code up-date management	○		List of up-date condition
○ Code up-date implementation	○		Up-date remote processing
Countermeasure of failure	○		
● Software reboot	○		
○ Data reception function	○		Reboot of data reception function
○ Data processing function	○		Reboot of data processing function
○ Data distribution function	○		Reboot of data distribution function
○ System management function	○		Reboot of system management function
● OS reboot	○		OS reboot
● Web server reboot	○		Web server reboot
● Data base reboot	○		Data base reboot
● Equipment reboot	○		Server equipment reboot

(2) Transmission server (main server group)

1) Data reception and storage function

Functional requirements for the data reception and storage function are as follows:

- Information transmitted from processing and management servers can be received by the data reception and storage function sector.
- Data records, such as early warning information transmission data, transmission status log data, BPBDs' access records to refer to the transmission server and so on, can be accumulated in the database.
- UTC shall be used as the system time configuration.
- The data can be stored and accumulated for more than 20 years.
- OSS such as Postgre SQL or other similar OSS shall be utilized for the database development.

2) Data distribution function

Functional requirements for the data distribution function are as follows:

- Early warning information can be transmitted to TV stations, radio stations, telecommunication carriers, SNS (Twitter, etc.) and others.
- System times of the data can be converted from UTC to local times.

(3) Backup server group

Functional requirements for the backup server group are as follows:

- The backup server group shall always synchronize with the main server group.
- The backup server group shall have the same functional requirements as the main server group.

2-2-2-4 Plan of Equipment Installation

(1) Possibility of regional server installation

With the aim of transmitting the information to be received from disaster information monitoring organization, KOMINFO had originally planned to install regional server in Padang on their original request. Advantages to install servers in regions are that regional information can be utilized and communicated mutually between the central and the regions

However, KOMINFO has not had a role to collect and accumrate the disaster information and the Project system was to be designed to only transmit early warning information on tsunami and earthquakes, provided by BMKG, to the related government organizations, mass media and telecommunication carriers; a one way transmission. The necessity to install regional servers therefore had to be further examined because as equipment to acquire disaster information in regions, they did not fit the Project design.

Accordingly, functions to be required for transmitting early warning and disaster information of tsunamis and earthquakes, and the pros and cons of central versus regional installation locations, were examined.

The required functions are as below.

- Functions for database and generating a screen display to deliver information in the intranet Web.
- Functions for database and generating a screen display to deliver information in the internet.

▶ Function for generating content for delivering data information.

(2) Consideration of each function

1) Intranet information distribution

The following chart shows results from the consideration of locations for database and servers togenerate screen displays in order to deliver information in the intranet.

Table 2-10: Consideration of locations for the intranet information distribution function

Item			Location			Evaluation
			Plan 1	Plan 2	Plan 3	
Plan	Data base generation function		Central	Central	Regional	Equipment : Database server
	Web screen generation function		Central	Regional	Regional	Equipment : Intranet Web server
Indicator	Difference of Web information	Information contents	【A】 None	【A】 None	【C】 Possibility of difference	In case of Plan 3, old information may be transferred continuously, when regional data base server doesn't receive latest information.
		Indication time	【A】 None	【B】 Possible delay	-	In case of Plan 2, information transfer may be delayed few seconds by traffic, however, it is not major impact.
	Web address		【A】 Single	【B】 Multiple	-	It is easy to refer single Web address, in case system failure is occurred.
	Load sharing	Server	【A】 Load balancer	【A】 Capacity growth	-	It is possible to solve by equipment procurement.
		Network	【B】 Centralized	【A】 Sharing	-	
	Load to access data base		【A】 Minor load	【C】 Major load	-	In case of Plan 2, network load is major between central and regional, therefore, information transfer may be delayed.
Evaluation			【A】	【C】	【C】	

【A】: Suitable for the Project implementation 【B】: Possible but requires consideration 【C】: Not suitable

After consideration, it was found that plan No. 1 is the most appropriate, which is to install the database servers and web servers for the Intranet in the center of the system in Jakarta and Bali.

2) Internet information distribution

The following chart shows the results from the consideration of locations for database and servers togenerate screen displays in order to distribute information in the internet:

Table 2-11: Consideration of locations for the internet information distribution function

Item			Location			Evaluation
			Plan 1	Plan 2	Plan 3	
Plan	Data base generation function		Central	Central	Regional	Equipment : General publication data base server
	Web screen generation function		Central	Regional	Regional	Equipment : Information publication portal server
Indicator	Difference of Web information	Information contents	【A】 None	【A】 None	【C】 Possibility of difference	In case of Plan 3, old information may be transferred continuously, when regional data base server doesn't receive latest information.
		Indication time	【A】 None	【B】 Possible delay	-	In case of Plan 2, information transfer may be delayed few seconds by traffic, however, it is not major impact.
	Web address		【A】 Single	【C】 Multiple	-	It is not possible to disseminate multiple Web address to unspecified users.
	Load sharing	Server	【A】 Load balancer	【A】 Capacity growth	-	It is possible to solve by equipment procurement.
		Network	【B】 Centralized	【A】 Sharing	-	
	Load to access data base		【A】 Minor load	【C】 Major load	-	In case of Plan 2, network load is major between central and regional, therefore, information transfer may be delayed.
Evaluation			【A】	【C】	【C】	

【A】: Suitable for the Project implementation 【B】: Possible but requires consideration 【C】: Not suitable

After the consideration, it was found that plan No. 1 is the most appropriate, which is to install the database servers and web servers for the Intranet in the center of the system in Jakarta and Bali.

3) Data information distribution

The following chart shows the result from the consideration of locations for the installation of servers that will house the function to create contents to deliver data information.

Table 2-12: Consideration of locations for data information distribution function

Item			Location			Evaluation
			Plan 1	Plan 2	Plan 3	
Plan	Contents (information) generation function		Central	Central	Regional	Equipment : CMS & mail server * It is not possible separation setting.
	Data distribution function		Central	Regional	Regional	
Indicator	Difference of Web information	Information contents	【A】 None	-	【A】 None	
		Indication time	【A】 None	-	【A】 None	
	Load sharing	Server	【A】 Increase setting	-	【A】 Increase setting	It is possible to solve by equipment procurement.
		Network	【B】 Centralized	-	【A】 Sharing	
Evaluation			【B】	【C】	【A】	

【A】: Suitable for the Project implementation 【B】: Possible but requires consideration 【C】: Not suitable

The results show that plan No. 3, which proposes to install Content Management System (CMS) and mail servers at regions, has superior points in terms of dispersion of network load. However, it can also be asserted that plan No. 3 is not largely different from plan No.1 where the server is to be installed in the center of the system in Jakarta and Bali.

(3) Server installation plan

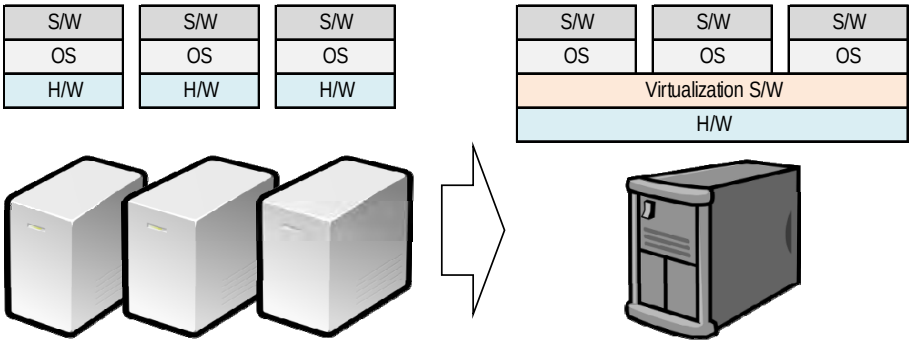
As the System transmits early warning information of tsunamis and earthquakes as the one way, the central server is enough to deal with the situation. There is therefore no other choice than advantage to installation of the servers in the center of the System, in Jakarta and Bali, for the third, data information distribution,

regional server installations show some superiority though not significantly, compared with the installation at the center. Centralizing all server functions will minimize the volume of equipment, the number of installation locations (operation locations) and, as a result, the cost of the installation. Additionally, management and maintenance of servers can be done smoothly. Considering the above, the servers will be designed to be installed in the center (in a Centralized System configuration), with the main server group in Jakarta and the back-up server group in Bali.

2-2-2-5 Structure of System Equipment

(1) Server virtualization

Usually, hardware, software and operating system are regarded as a unit of server structure when constructing server systems. However, it is possible to operate multiple software in single server by applying virtualized software and servers. The concept of server virtualization is shown as follows:



(S/W: Software, OS: Operating System, H/W: Hardware)

Figure 2-3: Concept of server virtualization

The comparisons between these two types of servers are shown in the below table. One is an ordinary physical server in which a single operating system is installed in a single server and the other is a Virtualization server in which multiple operating systems are installed.

Table 2-13: Comparison between physical server and virtualization server

	General physical server	Virtualization server
Setting	【A】 Easy	【B】 Slightly difficult
Operation and maintenance	【B】 Expensive and large number of staff	【A】 Cheap and small staff number
Processing capacity	【B】 Affected by equipment specification	【A】 Flexible
Scalability	【B】 Necessary study and consideration	【A】 Easy to extend
Reliability	【B】 Difficult to restore	【A】 Easy to restore
Evaluation	【B】	【A】

【A】:Good【B】: So-so【C】:Bad

In the Project, a virtualization server system shall be used because they have superiority compared to the ordinary physical server system with regard to operation and management, processing capacity, scalability and reliability. In the event of a disaster, the operation load is assumed to be concentrated on the server though server virtualization can realize dispersion of the concentrated load by operating multiple servers and consuming their memories simultaneously. In this case, there is no advantage to aggregate memories, thus, only the CPU shall be virtualized (aggregated).

(2) Physical server types

The results after considering types of physical servers to be installed in Cyber Building and NIX Bali are as follows:

Table 2-14: Comparisons of physical server types

	Rack type	Tower type	Blade type
Appearance			
Setting method	【A】 Suitable	【C】 Not suitable	【A】 Suitable
Failure restoration	【B】 Complex	【B】 Complex	【A】 Easy (In case of Virtualization)
Equipment redundancy	【A】 High redundancy	【A】 High redundancy	【C】 Low redundancy
Securement of expansion place	【A】 Easy	【B】 Difficult	【A】 Easy
Cost	【A】 Cheap	【A】 Cheap	【C】 Expensive
Evaluation	【A】	【C】	【C】

【A】:Good 【B】: So-so 【C】:Bad

After the consideration, a rack style shall be applied because it has superiorities compared with a blade type in terms of installation methods, redundancy of equipment and costs.

(3) Hardware structure

In the Project system, functions required by each hardwares are as follows:

Table 2-15: Functions required by the servers

Function	Virtualization server A	Virtualization server B	Virtualization server C	Operation monitoring server	Information publication server	Antivirus server
● Process and management functions						
* Data reception function	○					
* Data processing function	○					
* Web generation function						
Web contents generation	○					
Intranet transmission	○					
Internet transmission					○	
* Data distribution function	○					
* Data storage function	○					
* System management function				○		
● Transmission functions						
* Data reception and storage function	○					
* Data distribution function	○					
* SMS sending function	○					
● Network monitoring function		○				
● Monitoring condition indication function			○			
● Anti-virus function						○

The concept diagram of the server structure is as follows:

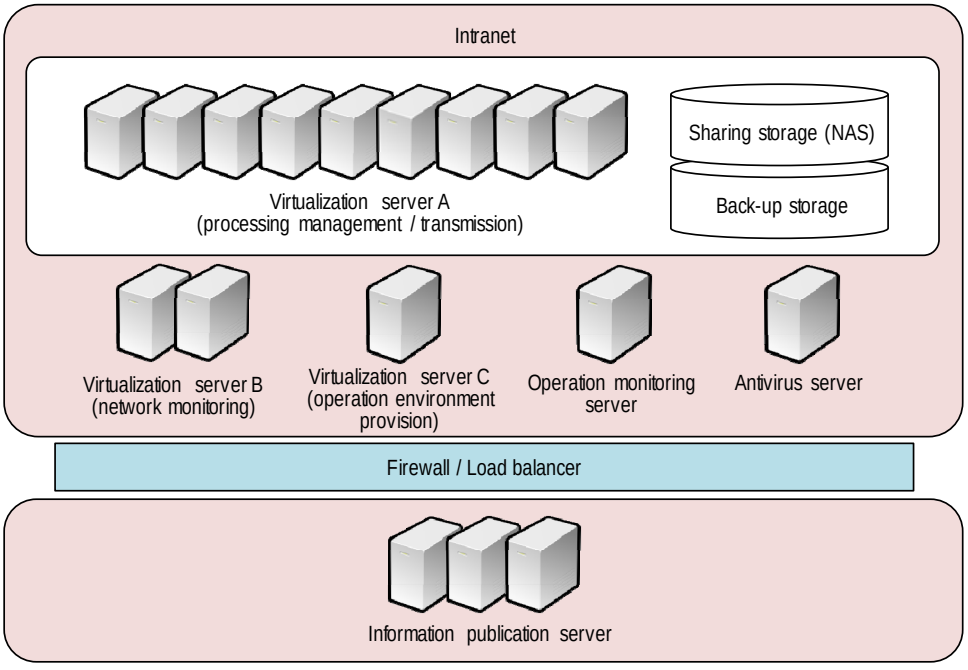


Figure 2-4: Conceptualization of server configuration

2-2-2-6 Equipment

The equipment to be procured by the Project is composed of hardware, purchased software and developed software. It is shown in the following list:

Table 2-16: List of equipment

No.	Item	Final destination		Total
		Jakarta	Bali	
A. Hardware				
A-1	Virtualization server A	9	9	18
A-2	Virtualization server B	2	2	4
A-3	Virtualization server C	1	1	2
A-4	Operation monitoring server	1	1	2
A-5	Information publication server	3	3	6
A-6	Antivirus server	1	1	2
A-7	Sharing storage	1	1	2
A-8	Back-up storage	1	1	2
A-9	L2 Switch	10	10	20
A-10	L3 Switch	2	2	4
A-11	VPN router A	6	6	12
A-12	VPN router B	2	2	4
A-13	VPN router C	10	10	20
A-14	Console	4	4	8
B. Purchased software				
B-1	Server OS, cloud infrastructure	12	12	24
B-2	Server OS, cloud infrastructure (Frontend)	1	1	2
B-3	Server OS (information publication server)	3	3	6
B-4	Server OS (physical server)	1	1	2
B-5	Server OS (physical server, CAL)	1	1	2
B-6	Clustering software	1	1	2
B-7	Monitoring software	1	1	2
B-8	Back-up software	1	1	2
B-9	Data base (CMS server)	12	12	24
B-10	Data base (others)	1	1	2
B-11	Constitution management software	1	1	2
B-12	Visualization software	1	1	2
B-13	WebGIS software	1	1	2
B-14	Antivirus software (server)	1	1	2
B-15	Antivirus software (Linux client)	32	32	64
B-16	Antivirus software (Windows client)	25	25	50
B-17	Screen aggregation software	1	1	2
C. Developed software				
C-1	Information collection function	1		1
C-2	Information generation function	1		1
C-3	Information delivery function	1		1
C-4	Business application function	1		1
C-5	Intranet Web function + Intranet WebGIS function	1		1
C-6	Information publication Web function	1		1
C-7	CMS function	1		1

2-2-2-7 Hardware Specification

(1) Virtualization Server A, shared storage and back-up storage

1) Required capacity

The following chart shows the required capacity of Virtualization Server A, Shared Storage and Back-Up Storage (together called Virtualization Server A (Package)). Taking the redundancy of the system into consideration, both the main server group (Jakarta) and back-up server group (Bali) are planned to have equal capacity.

Table 2-17: Required capacity of Virtualization Server A

Function	Requirement	Quantity	Remarks
Process and management function			
Data receive	No. of concurent processes	2	Same processes run dually to ensure certainty of receiving early warning information.
	Core	2	Process capacity must be sufficient to both receive and sort out data simultaneously and with speed.
	Memory	4 GB	Capacity to process telecommunications and sort out data is necessary. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as developed software. Disk capacity used by OS is expected to be 32GB.
Data process	No. of concurent processes	2	Same processes run dually to ensure certainty of sending early warning information to Web generation, data delivery and data storage functions.
	Core	2	Must have capacity to send above data immediately and at the same time.
	Memory	4 GB	Capacity to process errors in sending information to Web generation, data delivery and data storage functions. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as custom-developed software. Disk capacity used by OS is expected to be 32GB.
Web generation function			
Web contents generation	No. of concurent processes	4	4 systems must operate in tandem to generate early warning information for 4 types of main screens with certainty and with speed.
	Core	2	Capacity must be sufficient to generate Intranet and Internet contents simultaneously and with speed.
	Memory	4 GB	Must have capacity to generate above data immediately and at the same time. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as custom-developed software. Disk capacity used by OS is expected to be 32GB.
Intranet transmission	No. of concurent processes	2	Same processes run dually to ensure certainty of receiving early warning information.
	Core	4	Process capacity must be sufficient to send contents to more than 2,000 users.
	Memory	4 GB	2MB of memory capacity per Internet content user to be secured. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as custom-developed software. Disk capacity used by OS is expected to be 32GB.
Data delivery	No. of concurent processes	2	Same processes run dually to ensure certainty of sending early warning information.
	Core	12	Process capacity must be sufficient to generate and send contents to more than 2,600 mass media and telecommunication carriers.
	Memory	16 GB	10MB of memory capacity per media/carrier to be secured. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as custom-developed software. Disk capacity used by OS is expected to be 32GB.

Function	Requirement	Quantity	Remarks
Web generation function			
Data storage	No. of concurent processes	2	Same processes run dually to ensure certainty of storing early warning information.
	Core	2	Process capacity must be sufficient to store sent data with speed.
	Memory	4 GB	Capacity to operate software for data storage is necessary. Memory utilized by OS is expected to be 2GB.
	HDD	400 GB	Must sufficiently provide work areas for operation,developed software, and data storage. Disk capacity used by OS is expected to be 32GB.
Transmission function			
Data receive and storage function	No. of concurent processes	12	12 processes must operate in tandem to store early warning information with speed.
	Core	8	Process capacity must be sufficient to store contents to be sent to more than 2,600 mass media and telecommunication carriers.
	Memory	16 GB	Must have capacity to handle database for mass media and telecommunication carriers. Memory utilized by OS is expected to be 2GB.
	HDD	300 GB	Must sufficiently provide work areas for operation, developed software, and database. Disk capacity used by OS is expected to be 32GB.
Data transmission	No. of concurent processes	12	12 processes must operate in tandem to store early warning information with speed.
	Core	4	Process capacity must be sufficient to send contents more than 2,600 mass media and telecommunication carriers.
	Memory	4 GB	Must have capacity to handle delivery information for mass media and telecommunication carriers. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as developed software. Disk capacity used by OS is expected to be 32GB.
SMS delivery	No. of concurent processes	2	Same processes run dually to ensure certainty of sending early warning information.
	Core	1	Minor load, single core is sufficient.
	Memory	2 GB	Minimum unit generally available. Memory utilized by OS is expected to be 2GB.
	HDD	40 GB	Must sufficiently provide work areas for operation as well as custom-developed software. Disk capacity used by OS is expected to be 32GB.

The required capacity of server functions of Virtualization Server A (Package) is summarized as below:

Table 2-18: Summary of required capacity of Virtualization Server A (package)

Function	Core	Memory (GB)	HDD (GB)	No. of concurent processes	Necessary core	Necessary memory (GB)	Necessary HDD (GB)
	①	②	③	④	①×④	②×④	③×④
● Process and management							
* Data reception	2	4	40	2	4	8	80
* Data processing	2	4	40	2	4	8	80
* Web generation							
Web contents generation	2	4	40	4	8	16	160
Intranet transmission	4	4	40	2	8	8	80
* Data distribution	12	16	40	2	24	32	80
* Data storage	2	4	400	2	4	8	800
● Transmission							
* Data reception and storage	8	16	300	12	96	192	3,600
* Data distribution	4	4	40	12	48	48	480
* SMS delivery	1	2	40	2	2	4	80
Total	–	–	–	40	198	324	5,440

The required capacity of Virtualization Server A (Package) is total 198 CPU cores, 324 GB of total memory, and 5,440 GB of total disc capacity.

2) Basis of the specification of virtualization server A (package)

① Core (CPU)

The aggregation rate of core by virtualization is 60%. The number of cores per CPU available in the market is 2, 4, 8, 12, and 16, therefore the number of core per server will be16.

Required number of cores for Virtualization Server A: 198 cores x 60% = 118.8 cores
Required units of Virtualization Server A: 118.8 cores / 16 cores (per server) = 7.4 units

Therefore the required units of Virtualization Server A are 8 units.

② Memory

Required memory of Virtualization Server A is calculated and acquired by dividing the total required memory by the number of units of Virtual Server A.

Required memory per unit of Virtualization Server A: 324GB / 8 units = 40.8GB

Therefore the required memory shall be 48 GB, which is more than 40.8GB and prevalently found in the market.

③ Hard disk (external shared storage and back-up storage)

Required memory capacity of HDD (NAS):5,440 GB ≈ 6,000 GB

Therefore the capacity of HDD is 6TB. In addition, to secure redundancy, a back-up hard disk shall be prepared for a capacity equivalent to the HDD.

④ Internal hard disk

In order to operate each unit of Virtualization Server A, an internal storage is required in addition to the hard disk (NAS) mentioned above. The minimum size of internal HDD available on the market is 300GB therefore the internal HDD is 300GB.

⑤ Server to secure redundancy

To be prepared for an occurence of a physical problem with one of the Virtualization Server A units, an additional server shall be procured in order for the server to keep functioning, and to secure redundancy. In other words, the total number of server units of Virtualization Server A shall be 9.

3) Specification

The specification of Virtualization Server A, Shared Storage and Back-Up Storage is as follows:

Table 2-19: Specification for Virtualization Server A

Requirement	Detail
Duties	Provide the operation environment for virtualization server for all functions except Internet transmission
CPU	IntelXeon16C x 1 or equivalent, clock No.: Over 2.6 GHz
Main memory	Over 48 GB
Magnetic disk device	System capacity for OS etc.: Over 300 GB
LAN interface	1000BASE-T × 4 port or more
Display port	VGA or more
Power source	AC100-240V, 50/60Hz, 800W, redundancy (B3) type plug power cable × 2
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 9, Back-up server group (Bali): 9

Table 2-20: Specification for shared storage and back-up storage

Requirement	Detail
Duties	Provide necessary data storage area for operation of each function on virtualization server
Maximum storage capacity	6 TB
Support RAID	RAID4/5/6
Array controller	More than 2
LAN interface	1000BASE-T × 2 port or more, iSCSI
Storable drive No.	More than 12
Support drive	2.5 inch, SAS, 1.2TB/10,000rpm
Power supply	AC100-240V, 50/60Hz (B3) type plug power cable × 2
Chassis	Rack mount type Array controller: 2U or less, disk enclosure: 4U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Other	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 1, Back-up server group (Bali): 1

* Sharing storage and back-up storage are same specification.

(2) Virtualization Server B

1) Required capacity

The following chart shows the required capacity of Virtualization Server B. Taking the redundancy of the system into consideration, both the main server group (Jakarta) and back-up server group (Bali) are planned to have equal capacity.

Table 2-21: Required capacities of Virtualization Server B

Function	Requirement	Quantity	Remarks
Network monitoring	No. of concurent processes	2	Same processes run dually to ensure certainty in the monitoring of the network.
	Core	4	Process capacity must be sufficient to monitor the condition of network communication between physical and virtualization servers, suitable communication routes, and transmission conditions.
	Memory	8 GB	100MB of memory to be secured for each virtualization server. Memory utilized by OS is expected to be 2GB.
	HDD	300 GB	Capacity of built-in HDD is 300GB. Disk capacity used by OS is expected to be 32GB.

The required capacity of the server function of Virtualization Server B is summarized as below:

Table 2-22: Summary of required capacities of Virtualization Server B

Function	Core	Memory (GB)	HDD (GB)	No. of concurent processes	Necessary core	Necessary memory (GB)	Necessary HDD (GB)
	①	②	③	④	①×④	②×④	③×④
Network monitoring	4	8	300	2	8	16	600

2) Specification

Specification for Virtualization Server B is as follows:

Table 2-23: Specification for Virtualization Server B

Requirement	Detail
Duties	Monitor network including virtual network on virtualization server
CPU	IntelXeon4C x 1 or equivalent, clock No.: Over 2.8 GHz
Main memory	Over 8 GB
Magnetic disk device	System capacity for OS etc.: Over 300 GB
LAN interface	1000BASE-T × 4 port or more
Display port	VGA or more
Power supply	AC100-240V, 50/60Hz, 800W, redundancy (B3) type plug power cable × 2
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Other	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 2, Back-up server group (Bali): 2

(3) Specification of Virtualization Server C

1) Required capacity

Taking the redundancy of the system into consideration, both the main server group (Jakarta) and back-up server group (Bali) are planned to have equal capacity. The required capacity of Virtualization Server C is as follows:

Table 2-24: Required capacity of Virtualization Server C

Function	Requirement	Quantity	Remarks
Monitoring condition indication	No. of concurent processes	1	To provide a visualization of network and operation monitoring through the Web.
	Core	4	Sufficient capacity to handle mutlipel observers, as the results of network and operation monitoring would be provided through the Web.
	Memory	8 GB	Must have capacity to generate and provide content about monitoring. Memory utilized by OS is expected to be 2GB.
	HDD	300 GB	Capacity of built-in HDD is 300GB. Disk capacity used by OS is expected to be 32GB.

The required capacity of the server function of Virtualization Server C is summarized as below:

Table 2-25: Summary of Required Capacity of Virtualization Server C

Function	Core	Memory (GB)	HDD (GB)	No. of concurent processes	Necessary core	Necessary memory (GB)	Necessary HDD (GB)
	①	②	③	④	①×④	②×④	③×④
Monitoring condition indication	4	8	300	1	4	8	300

2) Specification

Specification for Virtualization Server C is as follows:

Table 2-26: Specification for Virtualization Server C

Requirement	Detail
Duties	Provide Web environment to operate and indicate the result of network and operation monitoring
CPU	IntelXeon4C x 1 or equivalent, clock No.: Over 2.8 GHz
Main memory	Over 8 GB
Magnetic disk device	System capacity for OS etc.: Over 300 GB
LAN interface	1000BASE-T × 4 port or more
Display port	VGA or more
Power supply	AC100-240V, 50/60Hz, 800W, redundancy (B3) type plug power cable × 2
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Other	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 1, Back-up server group (Bali): 1

(4) Operation Monitoring Server

1) Required capacity

Taking the redundancy of the system into consideration, both the main server group (Jakarta) and back-up server group (Bali) are planned to have equal capacity. The required capacity of the Operation Monitoring Server is as follows:

Table 2-27: Required Capacity of the Operation Monitoring Server

Function	Requirement	Quantity	Remarks
Operation monitoring	No. of concurent processes	1	Monitoring server operation.
	Core	4	Sufficient capacity to monitor the condition of operations in many servers both physical and virtualized.
	Memory	8 GB	100MB of memory to be secured for each virtualization server. Memory utilized by OS is expected to be 2GB.
	HDD	300 GB	Capacity of built-in HDD is 300GB. Disk capacity used by OS is expected to be 32GB.

The required capacity of the server function of the Operation Monitoring Server is summarized as below.

Table 2-28: Summary of Required Capacity of the Operation Monitoring Server

Function	Core	Memory (GB)	HDD (GB)	No. of concurent processes	Necessary core	Necessary memory (GB)	Necessary HDD (GB)
	①	②	③	④	①×④	②×④	③×④
Operation monitoring	4	8	300	1	4	8	300

2) Specification

Specification for the Operation Monitoring Server is as follows:

Table 2-29: Specification for the Operation Monitoring Server

Requirement	Detail
Duties	Monitor operation condition of virtualization server
CPU	IntelXeon4C x 1 or equivalent, clock No.: Over 2.8 GHz
Main memory	Over 8 GB
USB port	USB (3.0) × 4 port or more
Optical disk device	Internal console, super multi drive
Magnetic disk device	System capacity for OS etc.: Over 300 GB
LAN interface	1000BASE-T × 4 port or more
Display port	VGA or more
Power supply	AC100-240V, 50/60Hz, 800W, redundancy (B3) type plug power cable × 2
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Other	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 1, Back-up server group (Bali): 1

(5) Information Publication Server

1) Required capacity

Taking the redundancy of the system into consideration, both the main server group (Jakarta) and back-up server group (Bali) are planned to have equal capacity. The required capacity of the Information Publication Server is as follows:

Table 2-30: Required capacity of the Information Publication Server

Function	Requirement	Quantity	Remarks
Internet transmission	No. of concurent processes	3	Same process run in 3 strands to ensure certainty ofsending early warning information.
	Core	4	Process capacity must be sufficient to send contents to more than 3,000 users.
	Memory	8 GB	Internet content does not use WebGIS for map information, thus 6MB of memory capacity per Internet content user to be secured. Memory utilized by OS is expected to be 2GB.
	HDD	300 GB	Capacity of built-in HDD is 300GB. Disk capacity used by OS is expected to be 32GB.

The required capacity of the server function of the Information Publication Server is summarized as below:

Table 2-31: Summary of required capacity of the Information Publication Server

Function	Core	Memory (GB)	HDD (GB)	No. of concurent processes	Necessary core	Necessary memory (GB)	Necessary HDD (GB)
	①	②	③	④	①×④	②×④	③×④
Internet publication	4	8	300	3	12	24	900

2) Specifications

Specification for theInformation Publication Server is as follows:

Table 2-32: Specification for the Information Publication Server

Requirement	Detail
Duties	Internet Web server
CPU	IntelXeon4C x 1 or equivalent, clock No.: Over 2.8 GHz
Main memory	Over 8 GB
Magnetic disk device	System capacity for OS etc.: Over 300 GB
LAN interface	1000BASE-T × 4 port or more
Display port	VGA or more
Power supply	AC100-240V, 50/60Hz, 800W, redundancy (B3) type plug power cable × 2
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Other	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 3, Back-up server group (Bali): 3

(6) Antivirus Server

1) Required Capacity

Taking the redundancy of the system into consideration, both the main server group (Jakarta) and back-up server group (Bali) are planned to have equal capacity. The required capacity of the Antivirus Server is as follows:

Table 2-33: Required capacity of the Antivirus Server

Function	Requirement	Quantity	Remarks
Antivirus	No. of concurent processes	1	Monitors security of physical and virtualization servers.
	Core	4	Process capacity must be sufficient to monitor security of physical and virtualization servers.
	Memory	8 GB	100MB of memory to be secured for each virtualization server. Memory utilized by OS is expected to be 2GB.
	HDD	300 GB	Capacity of built-in HDD is 300GB. Disk capacity used by OS is expected to be 32GB.

The required capacity of the server function of theAntivirus Server is summarized as below:

Table 2-34: Summary of required capacity of the Antivirus Server

Function	Core	Memory (GB)	HDD (GB)	No. of concurent processes	Necessary core	Necessary memory (GB)	Necessary HDD (GB)
	①	②	③	④	①×④	②×④	③×④
Antivirus	4	8	300	1	4	8	300

2) Specification

Specification of the Antivirus server is as follows:

Table 2-35: Specification for the Antivirus Server

Requirement	Detail
Duties	Acquire software and pattern file for antivirus and provide them to other equipment
CPU	IntelXeon4C x 1 or equivalent, clock No.: Over 2.8 GHz
Main memory	Over 8 GB
Magnetic disk device	System capacity for OS etc.: Over 300 GB
USBﾎﾟｰﾄ	USB (3.0) × 4 port or more
Optical disk device	Internal console, super multi drive
LAN interface	1000BASE-T × 4 port or more
Display port	VGA or more
Power supply	AC100-240V, 50/60Hz, 800W, redundancy (B3) type plug power cable × 2
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Other	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 1, Back-up server group (Bali): 1

(7) Specification of Other Equipment

1) L2 Switch

Specification for the L2 Switch is as follows:

Table 2-36: Specification for the L2 Switch

Requirement	Detail
Duties	Provide network environment for intranet, internet, iSCSI and IP-VPN to each server
LAN interface	1000BASE-T × 48 port or more
Uplink interface	SFP × 2 or more
Power supply	AC100-240V, 50/60 Hz, power cable
Chassis	Rack mount type Array controller: 2U or less, disk enclosure: 4U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 10, Back-up server group (Bali): 10

2) L3 Switch

Specification for the L3 Switch is as follows:

Table 2-37: Specification for the L3 Switch

Requirement	Detail
Duties	Provide connection environment to internet and IP-VPN
LAN interface	1000BASE-T × 48 port or more
Security	Stateful inspection
Chassis	Rack mount type, 1U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 2, Back-up server group (Bali): 2

3) VPN Router A

Specifications for VPN router A is as follows:

Table 2-38: Specification for VPN Router A

Requirement	Detail
Duties	Provide connection environment to internet and IP-VPN
LAN interface	1000BASE-T × 8 port or more
WAN interface	1000BASE-T × 2 port or more
VPN connection number (Number of session)	10 or more
Security	Stateful inspection
Power supply	AC100-240V, 50/60Hz, power cable
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 6, Back-up server group (Bali): 6

4) VPN Router B

Specification for VPN router B is as follows:

Table 2-39: Specification for VPN Router B

Requirement	Detail
Duties	Provide connection environment to internet and IP-VPN
LAN interface	1000BASE-T × 8 port or more
WAN interface	1000BASE-T × 2 port or more
VPN connection number (Number of session)	100 or more
Security	Stateful inspection
Power supply	AC100-240V, 50/60Hz, power cable
Chassis	Lack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 2, Back-up server group (Bali): 2

5) VPN Router C

Specification for VPN router C is as follows:

Table 2-40: Specification for VPN Router C

Requirement	Detail
Duties	Provide connection environment to internet and IP-VPN
LAN interface	1000BASE-T × 10 port or more
WAN interface	1000BASE-T × 4 port or more
VPN connection number (Number of session)	550 or more
Security	Stateful inspection
Power supply	AC100-240V, 50/60Hz, power cable
Chassis	Rack mount type, 2U or less, D830mm or less
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 10, Back-up server group (Bali): 10

6) Console

Specification for the Console is as follows.

Table 2-41: Specification for the Console

Requirement	Detail
Duties	Indicate output screen information by virtualization server and operation monitoring server etc.
Interface	Analog RGB, digital RGB × 8 port or more USB2.0 × 8 port or more (for keyboard, mouse)
Power supply	AC100-240V, 50/60Hz, power cable
Chassis	Rack mount type, 1U or less, D830mm or less
Display	17-inchi LCD or more
Input	KVM Switch
Operation condition	Temperature: 10~40℃, humidity: 20~80%
Others	24 hours continuous operation EIA standard, installation rail for 19 inch rack
Quantity	Main server group (Jakarta): 4, Back-up server group (Bali): 4

2-2-2-8 Purchased Software

Purchased software to be installed in the system are as follows:

Table 2-42: Purchased software to be installed in the System

No.	Item	Final destination		Total
		Jakarta	Bali	
B-1	Server OS, cloud infrastructure	12	12	24
B-2	Server OS, cloud infrastructure (Frontend)	1	1	2
B-3	Server OS (information publication server)	3	3	6
B-4	Server OS (physical server)	1	1	2
B-5	Server OS (physical server, CAL)	1	1	2
B-6	Clustering software	1	1	2
B-7	Monitoring software	1	1	2
B-8	Back-up software	1	1	2
B-9	Data base (CMS server)	12	12	24
B-10	Data base (others)	1	1	2
B-11	Constitution management software	1	1	2
B-12	Visualization software	1	1	2
B-13	WebGIS software	1	1	2
B-14	Antivirus software (server)	1	1	2
B-15	Antivirus software (Linux client)	32	32	64
B-16	Antivirus software (Windows client)	25	25	50
B-17	Screen aggregation software	1	1	2

2-2-2-9 Developed Software

Custom developed software to be installed in the system are as follows.

Table 2-43: Specifications for developed software

No.	Software function	Duties
C-1	Information collection function	● Receive, store, and analyze data files transmitted from InaTEWS. Register results of analysis in database. ● Receive and store standard format data files on warnings. Register results of analysis in database.
C-2	Transmission information generation function	● Generate file for delivery.
C-3	Information delivery function	● Deliver data files. ● Record transmission conditions outputted from data delivery function. Register results of analysis in database server. ● Manage transmission condition of disaster information, such as warnings. BNPB will monitor transmission condition. Send BNPB data on transmission condition of disaster information as contents of Intranet Web.
C-4	Business AP function	● Allow KOMINFO to input warning information when BNKG etc. reports bounced messages etc. ● Acquire data on transmission condition from database server, including transmissions targeting KOMINFO and disaster condition transmission information targeting BNPB. ● Allow KOMINFO to manage delivery destinations of data, using data delivery function. Provide data on transmission condition to KOMINFO as contents on WebEOC server.
C-5	Intranet Web function + Intranet WebGIS function	● Publish disaster information on the Intranet. ● Provide transmission condition of data files transmitted by this system. ● Generate disaster information using map information. ● Provide information on disaster information receipt confirmation by disaster management organizations (BPBD etc.)
C-6	Information publication Web function	● Publish disaster information on the Inernet.
C-7	CMS function	● Receive data from delivery server. ● Generate contents from data received. ● Deliver and receive generated contents to each media. ● Manage contents delivery condition by each media. ● Output generated contents to existing delivery systems (including e-mail delivery systems).

2-2-2-10 Outline of System Structure

The system configuration outline is shown on the following page:

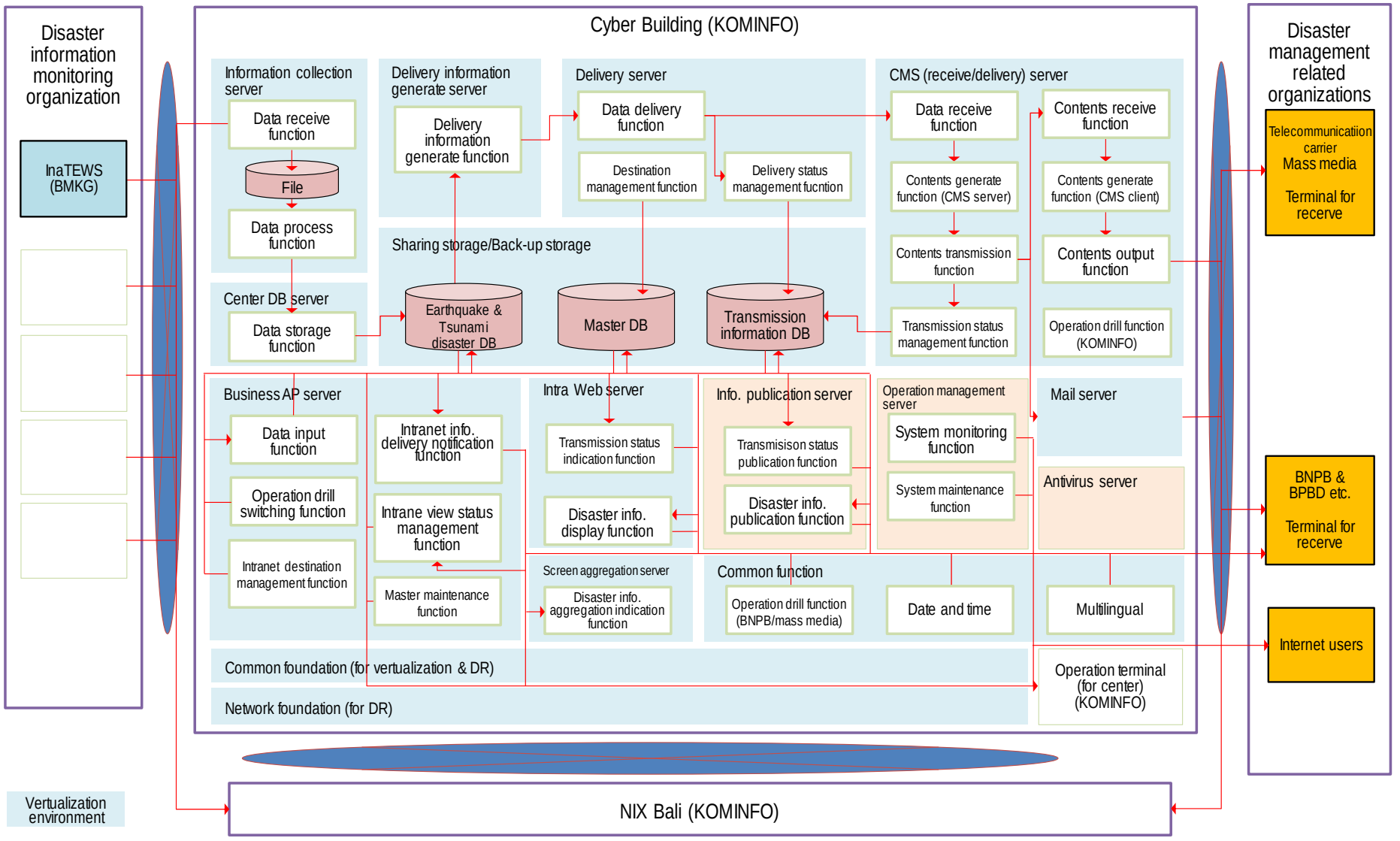


Figure 2-5: Outline system structure drawing

2-2-3 Implementation Plan

2-2-3-1 Implementation Policy

(1) Basic matters

The Project shall be implemented according to the Japanese Grant Aid scheme. The Grand Aid shall be provided based on the Exchange of Notes (E/N) approved and exchanged by the governments of Japan and Indonesia regarding the objective of the Project, implementing organizations, conditions and amount of Grant Aid. Following the E/N, the Grant Agreement (G/A) shall be signed between JICA and the government of Indonesia to define conditions of payment, responsibilities of the government of Indonesia and conditions of procurement. The detailed procedure of procurement under the Grant Aid scheme shall be agreed between JICA and the government of Indonesia at the time of signing of the E/N and G/A. In the Project, JICA's role is to promote the appropriate implementation of the Project, and products and services are provided according to the Grand Aid scheme.

(2) Procurement method

The Grant Aid funds shall be in principle utilized to purchase products of Japan and the recipient country or to pay for services by Japanese nationals or nationals of the recipient country. In addition, the Grant Aid funds can be used to pay for product and services of third countries (besides Japan or the recipient country) when JICA and the government of the recipient country (or authorities designated by the government) approve the purchase. However, when the Grant Aid is implemented, the prime contractor(s), in other words, the consultant and constructors are restricted to Japanese nationals.

In order to avoid inequality between/among the tenderers who are qualified to procure products and services, suppliers shall be selected by a competitive tender. A tender document shall be prepared by the consultant through discussion with the government of Indonesia.

(3) Implementation structure by the recipient country

The implementation organization with responsibility for the Project is KOMINFO. In order to implement the Project smoothly, KOMINFO must select a person in charge of the Project because frequent discussions and close contact between the consultant, constructors and concerned organizations on the Indonesian side will become indispensable.

(4) The consultant

1) Work prior to the tender

The consultant shall review the results and work by the preparatory survey. After the review, the consultant shall prepare a tender document. The document needs to be approved by the government of Indonesia to maintain the consistency of the work.

2) Work at the time of tender

At the time of tender, the consultant needs to conduct the below tasks:

- Prepare the tender documents (mainly specifications)

- Open the tender
- Answer the questions by tenderers and prepare an amendment to the tender
- Evaluate the tender and make an evaluation report of the tender
- Assist the negotiation of contract

3) Work to supervise the procurement

The consultant shall confirm whether the equipment shipped by the supplier complies with the required specification and quantity, and whether the equipment is installed and operated appropriately. Regarding the equipment which requires initial operation training, the consultant needs to supervise and confirm whether the training is conducted smoothly.

(5) Supplier

According to the Grant Aid scheme, a Japanese supplier selected by an open tender shall provide necessary materials, equipment and service after signing of the contract. As customer service is required even after the procurement of materials and installing of equipment, their availability for future contact shall also be sufficiently considered.

2-2-3-2 Implementation Conditions

(1) Securing temporary space to store equipment

The government of Indonesia shall secure a space to store the procured equipment temporarily until commencement of the installation work.

(2) Transportation of precision machinery

As equipment to be procured in the Project is precision machinery, the products shall be packed, protected and shipped in appropriate containers and cases. From the Port of Jakarta to Bali, the equipment shall be shipped in an independent single container to avoid damages by being mixed with other goods.

(3) Smooth preparation for implementation of the Soft Component

In order to commence soft component activities smoothly, it will be necessary to complete planned work such as equipment installation, adjustment, trial operation, initial operation training and so on, on schedule. Therefore, the supplier shall prepare for each task, taking into consideration the duration necessary to procure equipment and develop the system.

2-2-3-3 Scope of Work

The scope of work of Japanese and Indonesian sides in the Project is as follows:

Table 2-44: Scope of work

Contents	Japanese side	Indonesian side
1. Equipment		
■ Equipment procurement	○	
■ Secure electric power for equipment operation		○
2. Secure storage place for equipment		○
3. Equipment transportation and custom clearance etc.		
■ Transportation to Port of Jakarta	○	
■ Transportation to final destination	○	
■ Custom clearance		○
■ Duty-free		○
■ Acquisition of import permit		○
4. Banking Arrangement and Authorization to Pay		
■ Banking Arrangement (B/A)		○
■ Issue of Authorization to Pay (A/P)		○
■ Cost burden for above bank procedures		○
5. Procedure of emigration, immigration and stay in Indonesia		○
6. Procedure of necessary approval and license for the Project		○
7. Cost burden of related work not included in Grant Aid		○
8. Tender opening		
■ Preparation of tender documents	○	
■ Consulting service for tender and supervision	○	
9. Inspection for delivered equipment		
■ Inspection for equipment	○	○
■ Witness for inspection	○	○

2-2-3-4 Consultant Supervision

(1) Basic policy

The Consultant shall supervise the work of suppliers in order to implement the work under the contract smoothly and properly. Purposes of supervision are to assure required quality and appropriate procurement by complying with the specification of equipment procurement clarified by the contract. It is also required to confirm whether there is no discrepancy between the contract specification and the products to be procured in terms of quality, standard, function, etc. In addition, works to compile and keep document data, such as quality control data, photographic records, documents of equipment procurement and so on, shall be also supervised.

(2) Procurement supervising and management plan

The works of procurement management are as follows:

- Verification of drawings of equipment (in Japan)
  Verification whether the supplier designs the equipment according to the required specification.

- Inspection of products (in Japan)
  Inspect whether or not the supplier produces the equipment with required quality during the production process.
- Inspection prior to loading out (in Japan)
  Inspect whether or not the equipment with required specification and quantity are loaded out just before coming out from the manufacturer. Attendance of witnesses from the implementing organization (KOMINFO) shall be requested in order to witness and confirm that the equipment runs appropriately under a simulated installation environment. Two to three witnesses and two to three days for inspection shall be expected.
- Inspection prior to loading on the vessel (in Japan)
  Inspect whether or not the equipment with required specification and quantity is loaded on the vessel before the loading, at the international port near the place of manufacture of the products.
- Supervision of procurement (in Indonesia)
  To confirm the reception of the equipment with required specification and quantity shipped from Japan at destinations in Jakarta and Bali and to verify whether the equipment is installed and operated appropriately.
- Handover of equipment (in Indonesia)
  Conduct a final verification of the equipment with required specification and quantity attended by the concerned organization of Indonesia (KOMINFO) and handover the equipment.

As supervisors for equipment procurement work, the personnel below will be dispatched.

Table 2-45: Contents of the consultant's dispatch

Personnel	Duties	Period
Procurement supervisor	Project management, inspection, hand-over etc.	Total 0.60 M/M
Resident procurement supervisor	Supervision, inspection etc.	Total 3.80 M/M
Inspection engineer	Inspection of fabrication drawing, product, pre-shipment etc.	Total 1.30 M/M

2-2-3-5 Quality Control Plan

As the purpose of the provision of the system in the Project is to transmit early warning information of disasters, prompt and reliable communication of the information is necessary. In addition, early warning information is simultaneously provided to a number of the related government organizations, mass media and others, thus the process is concentrated within a short period of time. To develop a large scale system program, the whole system is divided into several segmentalized functions first, and programs developed for each segmentalized functions, one by one. Afterwards, programs for all the functions will be gradually aggregated and integrated into the system program as a whole.

Based on this process of the program development, tests will be conducted to secure the quality of the products at each stage of development, including tests for a segmentalized function (Unit Test), tests for the combination of several functions (Combination Test), tests for all functions (Comprehensive Test) and tests through operational trials which would double as training for system operators (Total OperationTest).

To develop the Project system, each of the abovementioned tests shall be fully conducted at each stage and each program shall be integrated step-by-step into the total system as described above. To develop tests, categories of areas to be tested, based on all functions to be realized by the program and from possible error scenarios for this particular system, would first be developed. Then the specific items to be tested shall be compiled in a design specification for the test, and each test shall be implemented based on the specification. At the comprehensive operation test, in addition to an ordinary all functions operation test, a long term continuous operation test and a mock loading test which simulates the situation under high concentration of communication, shall be implemented.

Towards quality management in system development, the occurrence of bugs in programs shall be monitored by calculating a bug appearance rate and evaluating it across time. The expected rate shall be calculated according to the scale of the developed program at each program stage. The quality of program development will be based on the convergence of the occurrence of bugs with the rate, as well an evaluation of the causes of bugs and other issues. If necessary, further measures, for example, an extension of the test process, can be taken.

These tests shall be implemented in Japan using equipment to be procured in the Project, but the comprehensive test also shall be conducted in Indonesia after the equipment is installed.

The detailed quality management plan shall be drawn up after setting up the standards and specifications for test items and the expected bug appearance rate at each stage. The plan will include operation tests for all functions, the long term continuous operation test, as well as loading tests.

2-2-3-6 Procurement Plan

(1) Procurement methods

In terms of disaster information communication, this Project requires the system to not only transmit early warning information to designated multiple parties rapidly and reliably, but also to observe the situations of communication at recipients' and note whether or not they receive the information; when the information transmission is delayed or bounced, the system is required to execute a complementary action. It is therefore necessary to develop tailor-made software for the Project system that will satisfy the above functional requirements, because there is no commercial software to meet with all above functions.The software shall be developed in Japan by referring to the design concept of the L-Alert system, which has been developed and used by Japan's Ministry of Internal Affairs and Communication. L-Alert is an existing system superior in terms of certainty of information transmission, capability for broadcasting and the scalability regarding information types in the future.

Further, the hardware shall be also procured from Japan in order to shorten the working period of overall system development, so that developing the software and confirming the software operation in the hardware can occur concurrently.

(2) Procurement plan of spare parts and expendable supplies

The equipment to be procured in the Project is classified into three categories; Hardware, Purchased software and Developed software (custom-made software). Spare parts and expendable supplies cannot be

supplied by the Project, as fall under the cagegory of equipment for repair and maintenance by local agents of the product manufacturer. No spare parts or expendable supplies will be required for the both kinds of software.

(3) Transportation plan

The equipment to be procured in the Project shall be shipped to their final destinations in Jakarta and Bali at the expense of the Japanese side.

After the equipment to be procured is loaded onto the vessel at the international port in Japan, it shall be shipped to the Jakarta port by sea freight. This shipment is expected to take about 20 days. After the equipment arrives in Jakarta, the procedure for tax exemption and then custom clearance will become necessary. The procedure for tax exemption is expected to take 7 days and custom clearance another 7 days. Afterwards, the equipment for Jakarta and Bali shall be packed separately according to their final destination. The equipment for Jakarta shall be transferred from the Port of Jakarta to the Cyber Building in Jakarta City by road transport. Taking traffic jams into consideration, it is expected to take about 120 minutes (distance approximately 20 km). Meantime, the equipment for Bali shall be shipped by sea and then transported to NIX Bali in Bali City from Bali Port by road transport, which will take 5 days.

Table 2-46: Shipment and transportation plan

Item		Means	Route	Period
Transportation from Japan		Marine	Japan to Jakarta port	20 days
Duty-free procedure at Port of Jakarta		–	–	7 days
Customs clearance at Port of Jakarta		–	–	7 days
Inland Transportation	Cyber Building	Inland	Jakarta port to Jakarta	2 hours
	NIX Bali	Marine and inland	Jakarta port to Bali	5 days
Total				Approx. 39 days

(4) Installation plan

As the equipment to be procured in the Project requires complicated wiring and equipment configuration works, Japanese engineers who have deep understanding of the structure of the Developed software shall be in charge of the installation of the equipment. It is expected to take 30 days to complete the installation by two engineers at each city, Jakarta and Bali. The dispatch of engineers for the installation is planned as follows:

Table 2-47: Dispatch plan of installation

Personnel		Days	Travel	Period	Place
Japanese engineer A	Installation	30 days	1	30 days	Jakarta
Japanese engineer B	Installation	30 days	1		
Japanese engineer C	Installation	30 days	1		Bali
Japanese engineer D	Installation	30 days	1		
Total		120 days	4	30 days	

(5) Plan for system adjustment and trial operations

System adjustment and trial operation shall be implemented after equipment installation. When communicating disaster information, even a small glitch can lead to increased casualties. Therefore, system adjustment and trial operations are crucial. It is expected to take 60 days for engineers to repeat check the

system based on possible operational scenarios. The personnel dispatched for this purpose shall consist of four engineers, which include two engineers to confirm software operation, one engineer to confirm hardware operation and one engineer to confirm information transmission. It should be noted that the operation of the Developed software is tested in Japan as part of equipment production in Japan, and will NOT be repeated in this phase.

The dispatch of personnel for system adjustment and trail operation are planned as follows:

Table 2-48: Dispatch plan of system adjustment and trial operation

Personnel		Days	Travel	Period	Place
Japanese engineer A	Application expert	60 days	1	60 days	Jakarta
Japanese engineer B	Application expert	60 days	1		Bali
Japanese engineer C	Electronic infra. Expert	60 days	1		Jakarta, Bali
Japanese engineer D	Delivery control expert	60 days	1		
Total		240 days	4	60 days	

2-2-3-7 Operation Guidance Plan

(1) Initial operation guidance

Operation methods of the equipment to be procured in the Project are not so complicated, but it is necessary that KOMINFO fully understand the system structure and system contents in order to operate appropriately. The Developed software in the Project is customized for the Project, and will be unique and relatively complicated. It is therefore expected to take about 30 days for KOMINFO staff to fully understand and to acquire the skills to operate the system.

Two engineers shall be allocated for providing initial operation guidance to KOMINFO and private companies who will operate and maintain the system on a sub-contract basis. They shall be the same engineers that will work on system adjustment and trial operation in the previous phase, equipment installation. They shall remain at the site after system adjustment and trial operation.

The dispatch of personnel for the initial operation guidance is planned as follows:

Table 2-49: Dispatch plan of initial operation guidance

Personnel		Days	Travel*	Period	Place
Japanese engineer A	Application expert	30 days	0	30 days	Jakarta
Japanese engineer B	Application expert	30 days	0		Bali
Total		60 days	0	30 days	

* Initial operation guidance will be conducted continuously from adjustment and trial operation, therefore, travel is not considered.

(2) Operation guidance plan

In the Project, no operation guidance is planned.

2-2-3-8 Soft Component (Technical Assistance) Plan

(1) Background of the Soft Component

In Indonesia, many types of natural disasters such as earthquakes, tsunamis, floods, landslides frequently occur. Many people were killed by the Indian Ocean Earthquake and Tsunami on December 26, 2004, the

May 2006 Central Java Earthquake and the July 2006 Java Earthquake.

In order to prepare for such large-scale natural disasters, the Indonesian government enacted the National Disaster Management Law in 2007 (Law No. 24-2007) in order to establish a framework for a national disaster management system.

Furthermore, the Government addressed the cross-sectional, governmental, plan regarding disaster management to strengthen the institutional system for all government related agencies in the National Medium-Term Plan (2010-2014).The National Disaster Management Plan (2010-2014), based on a concept of a cross-sectional government plan, puts KOMINFO in charge of planning and managing the provision of facilities and infrastructure for communication to support disaster management. BNPB and BPBD, as disaster management administrative agencies, have been working on disaster management by local governments and residents, such as education to raise awareness, evacuation drills, installing signboards for shelters and so on.

In 2009 the Agency for Meteorology, Climatology and Geophysics (BMKG) started the operation of InaTEWS to monitor, collect, analyze and deliver early warning information regarding earthquakes and tsunamis.

At the time of the Indian Ocean Earthquake in April 2012 (M8.7), confusion among residents conducting evacuation activities occurred due to bounced and delayed early warning information, which was caused by congestion in the communication network. This incident highlighted a problem of the current system.

In order to solve the problem, the Project aims to develop the Disaster Management Information System in KOMINFO which is the national administrative authority for the information and telecommunication in the country. The system shall aim to acquire and classify early warning information from InaTEWS and to transmit the information rapidly and reliably to the related government organizations, mass media and telecommunication carriers in targeted areas.

However, KOMINFO have no experience in handling disaster information and have no experience in the diasaster management field. Therefore it is assumed to be difficult for KOMINFO as the main organization to implement and manage the system appropriately without being strengthened in capacity. Implementation of a soft component accordingly has been planned, to make up for the shortage of capacity in KOMINFO in this field, and as a technical assistance that will ultimately enable the related government organizations to utlize the system according to their roles.

(2) Target of the Soft Component

The target of the soft component is “KOMINFO obtains the skill to transfer the necessary knowledge for the system operation”, and outputs and activities will be implemented to achieve the target of the soft component.

(3) Output of Soft Component

The outputs (direct output) to be achieved at the time of completion of the soft component are the following five:

Output 1: KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual.

Output 2: KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and

tsunami information to the procured system) to BMKG.

Output 3: KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.

Output 4: KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to BPBD.

Output 5: KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to mass media and telecommunication carriers.

(4) Implementation schedule for the Soft Component

There are two parts of this Soft Component, one where the Consultant provides training and instruction to KOMINFO staff, and another where KOMINFO provides training and instruction (System Operation Training) to the related government organizations, mass media and others.

The consultant will make a training manual (in Japan), which is estimated to take 10 days. Training of KOMINFO staff is expectedto take 5 days, and the joint work of making a System Operation Manual is expected to take another 20 days.

The System Operation Training of personnel at the related government organizations, mass media and others by KOMINFO is expected to take one day each for BMKG, BPBD, mass media as a group, and telecommunication carriers as a group. BNPB requires two days of instruction, one for System Operation Training, and one on monitoring transmission confirmation by BPBD and telecommunication carriers.

The System Operation Training for BPBD shall be conducted for operation staff from BPBDs in the Jakarta Special Capital Region (about 15 operators, two each from 7 to 8 BPBDs). KOMINFO is expected to continue System Operation Training for other Regions by themselves.

Table 2-50: Schedule of Japanese consultant for the Soft Component

Activities	Activity items	Numbers of days for the activities		Implementer & Target audience	Target participants
		Japan	Indonesia		
1	Preparation of Training-of-Trainers Manual	10 days	-	Japanese consultant	-
2	Traveling (Tokyo-Jakarta)	-	1 day	-	-
3	Training of Trainers for KOMINFO	-	5 days	Japanese consultant ⇒KOMINFO	Approximately 3 staff from KOMINFO
4	Preparation of the Disaster Information Utilization Manual as collaboration work between the consultant and KOMINFO staff	-	20 days		Approximately 3 staff from KOMINFO
5	Supporting System Operation Training for BMKG	-	1 day	KOMINFO ⇒Related government organizations, Mass mass media and telecommunication carriers	Approximately 10 staff from BMKG
6	Supporting System Operation Training for BNPB	-	2 days		Person in charge of BNPB (System Operation/Monitoring of the transmission status)
7	Supporting System Operation Training for BPBD	-	1 day		Approximately 15 staff from BPBD
8	Supporting System Operation Training for mass media and telecommunication carriers	-	1 day		Approximately 10 staff from mass media and telecommunication carriers
9	Supporting System Operation Drill	-	1 day		BNPB
		-	1 day		BPBD
		-	1 day		Mass media and telecommunication carriers
10	Traveling (Jakarta-Tokyo)	-	1 day	-	-
Japan/Indonesia Subtotal		10 days	35 days	-	-
Total		45 days		-	-

(5) Outputs of the Soft Component

The following outputs shall be submitted as outputs of the Soft Component. Reports and manuals written will be provided in English to KOMINFO and in Japanese to JICA.

1) Activity Report (JICA Indonesia Office, KOMINFO)
2) Training of Trainers Manual (English, KOMINFO: At end of Soft Component)
3) System Operation Manual (English, KOMINFO: At end of Soft Component)
4) Final Report (JICA: After returning to Japan)

(6) PDM of Soft Component

PDM of the soft component is as follows

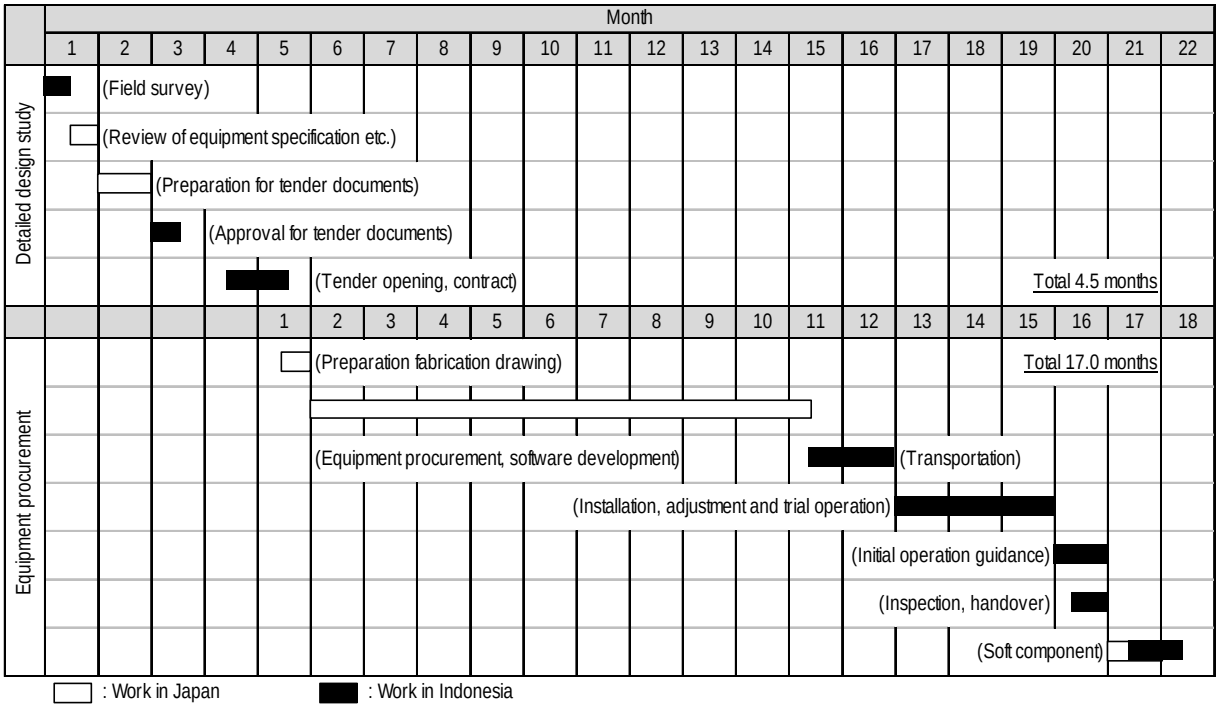
Table 2-51: PDM for the Soft Component

Summary of the Project	Indicator	Measurement	External condition
Overall goal Disaster Management Information System considered to procure in the preparation survey is appropriately operated.	• Role and cooperation in the Project system is comprehended by related government organizations, mass media and telecommunication carriers. • The Project system is operated stably by related government organizations, mass media and telecommunication carriers.	• Questionnaire to related government organizations, mass media and telecommunication carriers • Records of the System Operation Drill	
Target of the Soft Component KOMINFO obtains the skill to transfer the necessary knowledge for the system operation to related government organizations, mass media and telecommunication carriers.	• The necessary knowledge and skill for smooth operation is transferred to related government organizations, mass media and telecommunication carriers through the System Operation Training. • The System Operation Drills with related government organizations, mass media and telecommunication carriers are conducted by KOMINFO.	• Training-of-Trainers Manual • Disaster Information Utilization Manual (common manual for related government organizations, mass media and telecommunication carriers, including the method of the System Operation Drill) • Records of the System Operation Drill	Role of related government organizations, mass media and telecommunication carriers is not modified in the disaster management information system.
Output 1 KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual.	1.1 The contents and skills in the Training-of-Trainers Manual is acquired through the Training of Trainers. 1.2 The Disaster Information Utilization Manual is prepared (including the Project system outline, operation methods and the roles of related government organizations, mass media and telecommunication carriers in the system.	• Training-of-Trainers Manual • Disaster Information Utilization Manual	Sufficient cooperation for the Project activities is obtained from related government organizations, mass media and telecommunication carriers.
2 KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and tsunami information to the Project system to be procured) to BMKG.	2.1 The System Operation Training for BMKG fulfills the requirement of the consultant.	• Disaster Information Utilization Manual for BMKG • Assessment check list for the System Operation Training	
3 KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.	3.1 The System Operation Training for BNPB fulfills the requirement of the consultant. 3.2 System Operation Drills for BNPB are properly conducted.	• Disaster Information Utilization Manual for BNPB • Assessment check list for the System Operation Training • Records of the System Operation Drill	
4 KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to BPBD.	4.1 The System Operation Training for BPBD fulfills the requirement of the consultant. 4.2 System Operation Drills for BPBD are properly conducted.	• Disaster Information Utilization Manual for BPBD • Assessment check list for the System Operation Training • Records of the System Operation Drill	
5 KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to mass media and telecommunication carriers.	5.1 The System Operation Training for mass media and telecommunication carriers fulfills the requirement of the consultant. 5.2 System Operation Drills for mass media and telecommunication carriers are properly conducted.	• Disaster Information Utilization Manual for mass media and telecommunication carriers • Assessment check list for the System Operation Training • Records of the System Operation Drill	
Activities			Precondition
1: Training of Trainers for KOMINFO 2: Preparation of the Disaster Information Utilization Manual as collaboration work between Japanese consultant and KOMINFO 3: Supporting System Operation Training for BMKG 4: Supporting System Operation Training for BNPB 5: Supporting System Operation Training for BPBD 6: Supporting System Operation Training for mass media and telecommunication carriers 7: Supporting System Operation Drill using the system			Related government organizations, mass media and telecommunication carriers take part in the Project activities positively.

2-2-3-9 Implementation schedule of the Project

The implementation schedule of the Project is as follows:

Table 2-52: Implementation schedule of Project



2-3 Obligations of Recipient Country

2-3-1 Specific Items for the Project

(1) Obligations of KOMINFO

Obligations of KOMINFO are as follows:

- To ensure the prompt execution of unloading, customs, clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid
- To provide the storage site and space for the equipment to be procured
- To operate and maintain the equipment to be procured
- To secure organization, personnel and budget for operation and maintenance
- To secure network cost at the installation sites
- To secure IP-VPN connections
- To renew the Purchased software in the Project
- To provide the maintenance of the Developed software in the Project
- To coordinatewith organizations related to disaster information communication

(2) Obligations of BNPB and BPBD

Obligations of BNPB and BPBD as disaster management administrative organizations are as follows:

- To build capacity of regional related organizations such as BPBD, regional government, police, military and so on
- To implement disaster management education
- To provide terminals (computers) for data reception
- To provide staff that would maintain surveillance towards the reception of disaster information
- To secure IP-VPN connection. It is to be developed depends on dicision of each organization according to their institutional structure, budgets and etc.

(3) Obligations of the related government organizations (central government, local government, police and military etc.)

Obligations of the related government organizations are as follows.

- To provide terminals for data reception
- To secure IP-VPN connection. It is to be developed depends on dicision of each organization according to their institutional structure, budgets and etc.

(4) Obligations of mass media and telecommunication carriers

Obligations of Mass Media and Telecommunication Carriers are as follows:

- To provide terminals for data reception
- To secure IP-VPN connection. It is to be developed depends on dicision of each organization according to their institutional structure, budgets and etc.

2-3-2 General Matters

In the implementation of the Japanese Grant Aid scheme, the recipient country is required to undertake certain measures as follows:

- To explain, inform and communicate with government agencies concerned and related organizations for the recognition of the Project outline.
- To permit the Consultant and constructors to acquire all the data and information necessary for implementing the Project, and also to permit to transfer them to Japan.
- To bear the salary and other allowance for staff on the Indonesian side.
- To ensure the prompt execution of unloading, customs, clearance at the port of disembarkation and clearance for internal transportation of the products purchased under the Grant Aid.
- To exempt Japanese nationals and the employees of third country peoples, who are employed by the Japanese consultant and/or contractors, from custom duties, internal taxes and other fiscal levies, Also, the recipient country shall issue the entry visas and work permits to the above Japanese nationals and the employees of third country people to execute the Project.
- To exempt the Japanese Consultant and contractors from taxes under the verified contracts.
- The recipient country is requested to operate and maintain (O&M) the facilities constructed under the Grant Aid appropriately and effectively and also requested to assign staff necessary for this O&M as well as to bear all expenses other than those covered by the Grant Aid.
- The products purchased under the Grant Aid shall not be re-exported from the recipient country and /or sold off to third party countries.
- The government of the recipient country or its designated authority should open and account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (herein after referred to as “the Bank”. The government of Japan will execute the Grant by making payments in Japanese Yen to cover the obligations incurred by the Government of the recipient country or its designated authority under verified contracts.
- The payment will be made when payment request are presented by the Bank to the Government of Japan under the Authorization to Pay (A/P) issued by the government of the recipient country or its designated authority.
- The government of the recipient country shall bear expenses caused by the A/P, such as the advising commission for the A/P, the payment of the A/P and others to the Bank dealing with the A/P.

2-4 Project Operation Plan

2-4-1 Basic Policy

The equipment to be procured in the Project shall be installed at Cyber Building in Jakarta and NIX Bali in Bali. KOMINFO shall take out a contract for the maintenance of the equipment with a private company which manages the facilities in Jakarta and Bali. The private management company will be in charge of the operation and maintenance management of the equipment.

In addition, InaTEWS, which provides earthquake and tsunami information for the system, shall be

managed by BMKG, i.e. continue the current arrangement. Disaster management organizations, such as BNPB, BPBD, and the related government organizations, such as regional governments, Military, Police and so on, shall arrange to prepare appropriate equipment, such as the terminal reception equipment (PCs), communication lines with the secured bandwidth and so on, in order to utilize the information from the Project system for making decisions for activities to respond to disasters promptly. It is also necessary to build the system structure to disseminate the information to residents in order to realize the effective output envisioned by the Project.

The cooperation among all organizations related to disaster management is indispensable for continuous operation of the Disaster Management Information System as provided by the Project.

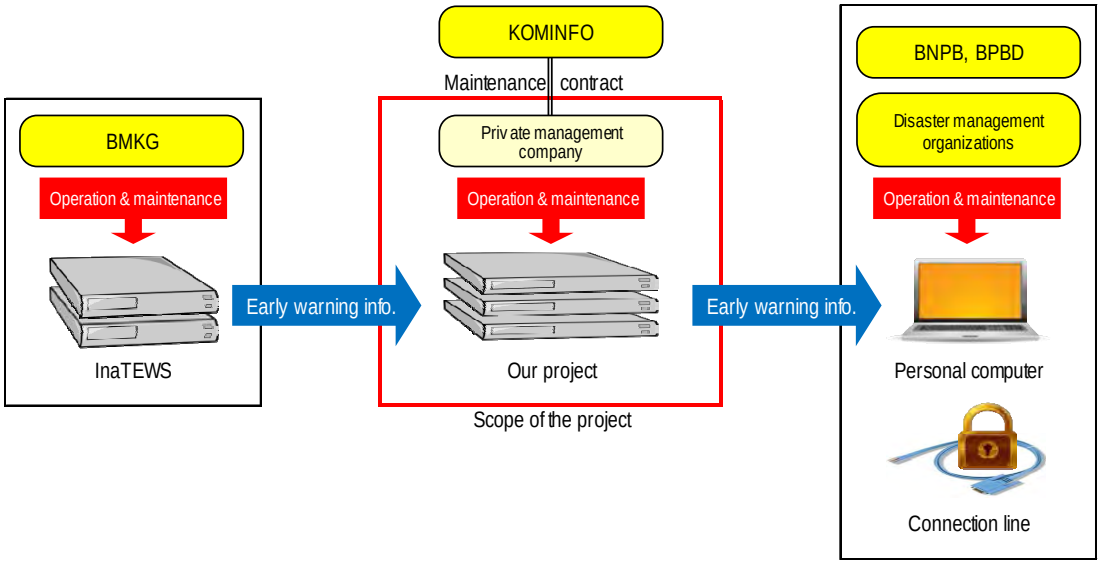


Figure 2-6: Operation and maintenance structure of related organizations

For software, it is common to carry out operation and maintenance under a maintenance contract with the company who developed the system/program. Particularly regarding the developed software to be procured by the Project, taking into account the uniqueness and complexity of the system structure, and the likely possibility to add other disaster types to the system in the future, it is recommended as the best method that the Japanese company that develops the system/program be contracted to maintain the system after the installation and the expiration of the warranty term.

Further, it was confirmed that Porject contractors shall be decided by competitive bidding as it is regulated to do so in the public procurement regulation in Indonesia if the contract cost exceeds 200 million IDR (about 20 million Japanese yen) or more.

2-4-2 Organization Structure for System Operation and Management

KOMINFO has been planning to set up a new organizational formation for the operation and maintenance management for the Project system by allocating engineers in the Directorate General of Post & Information Technology, which is the implementing Directorate General in KOMINFO. The new organization will be composed of existing staff of the Directorate General.

KOMINFO plans to conclude a contract with private companies to manage hardware and software

maintenance of the equipment to be installed in Cyber Building in Jakarta and NIX Bali in Bali. The new organization will manage and operate the system based on the organizational structure below:

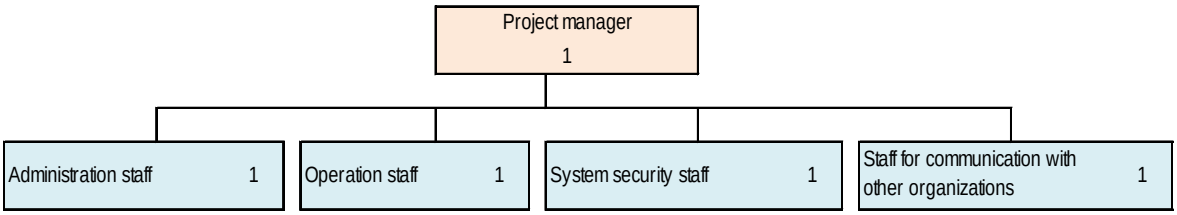


Figure 2-7: Organization structure of system operation and management of KOMINFO

Table 2-53: Duties of the system staff

Staff	No.	Duties
Project manager	1	Managing for the project
Administration staff *	1	Administration for the project team
Operation staff *	1	Operation of the project and supervision
System security staff	1	Monitoring for system security
Staff for communication with other organizations *	1	Relation with other organizations

* Implementation target of soft component

2-5 Project Cost Estimation

2-5-1 Approximate Cost Estimation

(1) Cost for Indonesian side

The cost borne by the main implementation organization, KOMINFO is estimated as below:

Table 2-54: Cost borne by KOMINFO

Burden: 177 million IDR (Approx. 1.6 million JPY)

Organization	Contents		No.	Unit	Unit cost (million IDR)	Cost (million IDR)
KOMINFO	Commision for Banking Arrangement (B/A)		1	Unit	114	114
	Cost for line opening	Jakarta	3	Line	3	9
		Bali	3	Line	3	9
	Cost for soft component		3	Man-month	15	45
Total						177

It is recommended that information receipient organizations from the Project install and connect to the IP-VPN in order to utilize the Project system effectively, although the system is capable of connection and reception by existing Internet access. In order that those organizations take appropriate steps to request budgets, it is essential that the main implementation organization, KOMINFO, work with these organizations. The estimated costs required by the organizations are shown as below:

Table 2-55: Costs borne by the related organizations and others

Burden: 47,260 million IDR (Approx. 430.0 million JPY)

Organization	Contents		No.	Unit	Unit cost (million IDR)	Cost (million IDR)
BNPB	Cost for information receiving terminal (PC etc.)		1	Unit	10	10
BPBD *1	Cost for information receiving terminal (PC etc.)		534	Unit	10	5,340
Related government organizations *1	Cost for information receiving terminal (PC etc.)	Central government *2	34	Unit	10	340
		Local government	507	Unit	10	5,070
		Police	507	Unit	10	5,070
		Army	507	Unit	10	5,070
Mass media etc. *1	Cost for information receiving terminal (PC etc.)	TV station	238	Unit	10	2,380
		Radio station	2,392	Unit	10	23,920
		Tele-communication carrier	6	Unit	10	60
Total						47,260

*1 It should be installed by each organizations depends on one's decision due to disparty finance among these organizations.

*2 It is 34 organizations defined as 37 capital organizations in National Disaster Prevention Plan except KOMINFO, BMKG and BNPB.

(2) Conditions of cost estimation

1) Time of cost estimation

The survey at the site in the Project has completed on 5th September 2015. Therefore, the time of cost estimation is September 2015.

2) Exchange rate

Exchange rate between USD, JPY and IDR is as below:

1USD = JPY124.40
1IDR = JPY0.0091

3) Period of procurement

The period of procurement is as “2-2-3-9 Implementation plan”.

4) Others

Cost estimation is based on the Japanese Grant Aid scheme.

2-5-2 Cost of Operation and Maintenance Management

(1) KOMINFO

1) Contract for software maintenance

After the completion of the period of warranty against defects, monthly payment will become necessary for software maintenance including software renewal maintenance and troubleshooting.

2) Rental fees etc. for facilities for the equipment

In order to utilize equipment continuously, monthly payments will become necessary, for example the rental fee of the facilities where equipment will be installed (Cyber Building and NIX Bali), network fees and additional electricity fees (if the consumption amount of electricity is over 10A per month).

3) IP-VPN connection

A connection fee will become necessary on a monthly basis between the system in the Project and InaTEWS at BMKG, as well as IP-VPN connection fees between the main server (Jakarta) and back-up server (Bali).

4) Personnel for the Surveillance of Information Transmission

In order to monitor the status of information transmission, staff will need to be secured for 24 hour monitoring and surveillance of transmissions.

(2) BNPB and BPBD

1) IP-VPN Connection

A connection fee from BNPB and BPBDs to the main and back-up servers of the system must be paid every month.

2) Personnel for Surveillance of Information Reception

BNPB is required to supervise and train engineers from the BPBDs and maintain surveillance on whether they are able to receive early warning information or not. Therefore, in order to monitor the status of information receiving, staff will need to be secured for 24 hour monitoring and surveillance of information reception by BPBDs.

(3) The related government organizations, mass media and others

Fees for IP-VPN connections from the related government organizations, mass media and others to the main and back-up servers in the system will become necessaryevery month.

(4) Annual operation and maintenance management cost

Expected fees for the operation and maintenance management of the system on the Indonesian side are as follows:

Table 2-56: Operation and Maintenance Cost borne by KOMINFO

Operation & Maintenance cost: 2,128 million IDR (Approx. 19.3 million JPY)

Organization	Contents		No.	Unit	Unit cost (million IDR)	Cost (million IDR)	
						per month	per year
KOMINFO	Rent fee for Cyber building and NIX	Jakarta	4	rack	12.0	48.0	576.0
		Bali	4	rack	10.0	40.0	480.0
	Usage fee for network	Jakarta	3	Line	0.3	0.9	10.8
		Bali	3	Line	0.3	0.9	10.8
	Electricity usage fee	Jakarta	40	A	0.4	16.0	192.0
		Bali	40	A	0.4	16.0	192.0
	Usage fee for IP-VPN	to BMKG-Jakarta	2	Line	2.1	4.2	50.4
		to BMKG-Bali	2	Line	2.1	4.2	50.4
		Jakarta to Bali	1	Line	2.1	2.1	25.2
	Personnel expenses for obserbers		3	Man-month	15.0	45.0	540.0
Total							2,127.6

In order to utilize the Project system effectively, the continuous involvement of the related government organizations, mass media and othres in the Project is inevitable and, some costs will occur that will have to be borne by these organizations to maintain operation. In order that those organizations take appropriate steps to request budgets, it is essential that the main implementation organization, KOMINFO, work with these organizations. The estimated costs required by the organizations are shown as below:

Table 2-57: Operation and maintenance costs borne by the related organizations

Operation & Maintenance cost: 238,730 million IDR (Approx. 2,172.4 million JPY)

Organization	Contents		No.	Unit	Unit cost (million IDR)	Cost (million IDR)	
						per month	per year
BNPB	Usage fee for IP-VPN		2	Line	2.1	4.2	50.4
	Personnel expenses for obserbers		3	Man-month	15.0	45.0	540.0
BPBD *1	Usage fee for IP-VPN		1,068	Line	2.1	2,242.8	26,913.6
Related government organizations *1	Usage fee for IP-VPN	Central government *2	68	Line	2.1	142.8	1,713.6
		Local government	1,014	Line	2.1	2,129.4	25,552.8
		Police	1,014	Line	2.1	2,129.4	25,552.8
		Army	1,014	Line	2.1	2,129.4	25,552.8
Mass media etc. *1	Usage fee for IP-VPN	TV station	476	Line	2.1	999.6	11,995.2
		Radio station	4,784	Line	2.1	10,046.4	120,556.8
		Tele-communication carrier	12	Line	2.1	25.2	302.4
Total							238,730.4

*1 It should be installed by each organizations depends on one's decision due to disparty finance among these organizations.

*2 It is 34 organizations defined as 37 capital organizations in National Disaster Prevention Plan except KOMINFO, BMKG and BNPB.

(5) Appropriateness of operation and maintenance management costs

KOMINFO will need to allocate IDR 2,128 million (JPY 19.3 million) of the budget, annually, as the operation and maintenance cost of the Project system. The amount is equivalent to approximately 0.4% of the total annual budget of the Directorate General of Post & Information Technology in 2013, and KOMINFO has the enough budgetary capability to allocate this amount for the Project.

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3-1 Preconditions

Roles and policies of various the related government organizations, mass media and othres have been outlined in the National Disaster Management Plan, and agreement by related organizations on KOMINFO's authority to carry out disaster information communication has been heard, but there is no clear legal background endorsing KOMINFO's authority. At the samae time, while this Project will realize the rapid transmission of early warning information to the related government organizations, an early warning information system can be said to be constructed only when the organizations utilize the information in their disaster management activities. Based on such considerations, the preconditions of implementing the Project shall be understood as follows:

- KOMINFO shall surely implement transmission of tsunami and earthquake information based on the DMIS,
- KOMINFO shall continuously extend the effects of the Mutual Agreement (M/A) with BMKG and the Memorandum of Understanding (MoU) with BNPB, in order to clarify roles and the range of cooperation in the field of disaster information communication,
- KOMINFO shall provide guidance to mass media and telecommunication carriers regarding early warning information transmission as their regulatory ministry, and shall issue the ministry regulation to define their duties,
- Mass media and the telecommunication carriers shall deliver early warning information to residents

3-2 Necessary Inputs by the Recipient Country

(1) Maintenance and continuation of the Mutual Agreement between KOMINFO and BMKG regarding disaster information communication

In May 2015, the M/A between the Minister of KOMINFO and the Chief of BMKG was concluded. It has been stated and agreed that BMKG will provide information about weather, climate and geophysics to KOMINFO and that KOMINFO deliver the information to the public. On the same day, a Cooperation Agreement (CA) between the Director General of Post & Information Technology of KOMINFO and the First Secretary of BMKG was concluded, to more specifically define the cooperation and roles of the both sides to implement the MA. However, the validity period of this MA is five years.

That early warning information about earthquakes and tsunamis be reliably provided from BMKG as the disaster information monitoring organization significantly affects the success of the Project. Sustainable involvement of BMKG in the Project is essential and it is therefore necessary to renew and extend the effects of the MA between KOMINFO and BMKG, prior to their expiration.

(2) Maintenance and continuation of the MoU between KOMINFO and BNPB regarding disaster information communication

In 2012, a Memorandum of Understanding (MoU) between the Minister of KOMINFO and the Chief of BNPB was concluded. The validity period of the MoU is also five years. It is stated in the MoU that specific

activities and methods about the cooperation will be defined in the Cooperation Agreement (CA), but the CA has remained in draft processing stage and has not been concluded. It is therefore necessary to renew the MoU before its expiration and to conclude the CA to define specific cooperation activities to achieve the contents of the MoU.

It is expected that early warning information can be delivered to residents more rapidly, compared with the present situation, by implementing the Project system. At the same time, information arriving into resident's hands could become a factor to generate confusion during evacuation activities and other activities unless the related government organizations such as BNPB and BPBD receive the information, respond rapidly and utilize the information in their disaster management activities. Also, disaster education of residents could become more important, so that appropriate judgment and activities can be taken by residents after they receive early warning information.

(3) Continuity of the KOMINFO's implementation of Project activities

As mentioned above, KOMINFO is the responsible organization for provision of infrastructure of disaster information communication though there is no clear legal basis that makes KOMINFO legally responsible, at present. DMIS is a plan to receive early warning information from disaster information monitorings organizations and to transmit it rapidly to the related government organizations; it is assumed that DMIS leads to the sustainability of the Project. It is therefore expected that KOMINFO issue appropriate laws and regulations to promote DMIS and that, as a result, the sustainability of the Project be secured.

In addition, organizaions responsible for monitoring disasters are various according to disaster types and their leagal responsibilities for the monitoring are clearly stipulated by laws and regulations. There is however no robust and comprehensive legal definition regarding disaster information communication. It is important that the System to be procured by the Project be the core of the disaster information communication in the country when the comprehensive legal structure is build up in the future.

(4) To secure communication bandwidth

In order to ensure early warning information is transmitted immediately and with certainty, it is required to secure communication lines with secure communication bandwidths, such as by IP-VPN, between InaTEWS of BMKG and servers of KOMINFO to be procured in the Project, between KOMINFO's servers to BPBD, BNPB, mass media and etc. Further, the secured lines must be continually maintained by each organization.

(5) To secure the budget for the Project Implementation

KOMINFO shall secure the budget and personnel to implement and operate the Project appropriately and sustainably.

(6) Inputs from the recipient country regarding custom clearance of the equipment and tax exemption procedures

It is indispensable for the Indonesian side to perform the procedures for custom clearance and tax exemption in order to implement the Project under Grant Aid cooperation.

3-3 Important Assumptions

Important assumptions for the Project implementation are as below:

- Integracy agreement shall be maintained to agree KOMINFO's responsiblity for disaster information communication among related ministries and agencies,

3-4 Project Evaluation

3-4-1 Relevance

The legal authority for KOMINFO to transmit the disaster information in the country currently relies on a MA with BMKG and the MoU with BNPB. It is defined in the National Disaster Management Plan (2015 2019) as KOMINFO to be responsible for provision of infrastructure for disaster information although more definite legal background has not been seen. In addition, KOMINFO has embarked on a demonstration experiment of SMS broadcast-transmission of disaster information by LBS based on the MA with BMKG for the purpose to promote disaster information transmission in cooperation with BMKG and tele-communication carriers. Further, KOMINFO has concluded the Memorundum of Understanding with BNPB to cooperate one another pertaining to disaster information transmission. Those documents of interagency agreements are assumed to complement the absence of legal background of KOMINFO and enough to assure their authority. It is therefore considered that KOMINFO's authority to work on disaster information in the country is clear.

Further, KOMINFO has been promoting the provision of the Disaster Management Information System (DMIS) as described in the Ministry Midterm Starategy Plan 2015-2019 and a Minister's Decree regarding the DMIS has been prepared and is planned to be issued in the near future. The decree will be a more rigid legal background that endorses KOMINFO's authority. The Decree will touch on the following issues:

- Responsibilities and roles of KOMINFO, early warning information monitoring organizations and mass communication and telecommunication carriers,
- KOMINFO's authority to enforce their supervision and guidance on mass communication and telecommunication carriers to transmit early warnings and disaster information,
- Responsibilities of mass communication and telecommunication carriers to identify citizens in the disaster influenced area and to transmit early warnings and disaster information,
- Necessary components of early warnings, disaster information and etc.

In addition, KOMINFO has embarked on a demonstration experiment of disaster information transmission, based on the interagency agreements among ministries and other government agencies, in cooperation with the BMKG and telecom operators, which is as described above. This is the experiment for BMKG to transmit the experimental data to telecommunication carriers and then for the carriers to disseminate the data to terminal receivers in specific geographical areas identified by the LBS. This is the system to target to transmit the data to the last one mile, which means terminal mobile users. If this LBS transmission is realized, it will be very effective to transmit the earthquake and tsunami information from the carriers to the last mile after the information transferred from this System.

It can be thus considered that the certainty of the equipment to be procured in the Project being utilized sustainably and effectively is high, considering theat KOMINFO is already taking such steps toward better disaster information communication. Thus the relevance of a grant aid project to equip KOMINFO for disaster information communication is high.

It has also been determined that the implementation of the grant aid project is relevant from the following points of view:

- At present, data transmission by SMS from BMKG has been done to individuals in disaster management organizations and the related government organizations. This data transmission is done via the telecommunication carriers though the data have not been transmitted yet from the carriers to the general mobile phone users. A significant number of users of mobile phones and users of the Internet (i.e. residents of Indonesia) will be the beneficiary of the Project because telecommunication carriers companies will be one of the recipients of information, and mobile phones and the internet can be used to distribute disaster information.
- A public communication line is currently being used by the disaster information system and congestions and delays of information occurred at the time of the 2012 Indian Ocean Earthquake due to this reason. As the Project uses a secured bandwidth communication line, it can be expected that communication of early warning information will take place more rapidly and securely and that, as a result, the Project will significantly contribute to disaster management by the residents.
- The Indonesian Government has listed the establishment of the Disaster Management System at the national level as one of its prime targets, and implementing the Project will contribute to the achievement of this target.
- KOMINFO is the main administrative government ministry that dealis with ICT and they have the skills, know-how and experience to manage and maintain equipment and systems for information communication. Currently, servers owned by KOMINFO have been regularly managed by private maintenance and management companies on a sub-contract basis and KOMINFO supervises the management companies. It can be expected that the Project equipment will be managed in the same way as above, and it is possible to conclude that KOMINFO can sustainably maintain and manage the Project system.
- The equipment to be procured by the Project will not be utilized for any profitable activities but utilized only for communicating early warning information, a purpose which has significantly high public value. It is therefore considered that the implementation of this Project will be in accordance with the primary policy objective of Japan’s Grant Aid Projects.
- Construction of new facility buildings will not happen in this Project’s implementation, as the equipment to be procured by the Project will be housed in exiting buildings namely the Cyber Building and NIX Bali. Accordingly, there will be no need for environmental impact assessment during the installation of the equipment and no issues of land acquisition, resident relocation and so on.
- In the current situation, by the delay and confusion of disaster information transmission, troubles have occurred on the appropriate transmission and disaster response activities to the residents. Response by the implementation of this Project is immediately required in order to minimize disaster damages caused

by the tsunamis and earthquakes.

- Japan has been promoting the expansion of disaster management by utilizing ICT in overseas countries. In April 2013, it was confirmed between the Japanese Minister of Internal Affairs and Communications and the KOMINFO Minister to introduce ICT for disaster management in the cooperation activity between the Japan and Indonesia. It is significant to utilize IC technology for the disaster management information in the country where many and various disasters happen because the technology is the strong field of Japan and the strength can be utilized effectively in the cooperation activity.
- Implementation of the Project will contribute to the promotion of implementing the "Sendai Framework 2015-2030", which was enacted in the US World Conference on Disaster Risk Reduction in December 2015, and "World Tsunami Awareness Day", which was adopted in March 2015. It can be expected by implementing the Project that the opportunities for the residents to obtain disaster information will increase and that the Project to contribute to the enlightenment of the consciousness of the tsunami and earthquake disaster management by using the training function of the Project System.

3-4-2 Effectiveness

(1) Quantitative impacts

Quantitative impacts expected from the Project implementation are as follows:

Table 3-1: Quantitative impacts from the implementation of the Project

Index		Reference value (2015)	Target value 【After 3 years from completion(2021)】
Increase in the number of organizations to whom disaster information will be delivered		2,800 ● Disaster management organizations: App.300 ● Central government: 0(*1) ● Local government: 0(*1) ● Military and police: App.500 ● Mass media: App.2,000 ● Telecommunication carrier: 0(*2)	4,728 ● Disaster management organizations: 534 ● Central government: 37 ● Local government: 507 ● Military and police: 1014 ● Mass media: 2,630 ● Telecommunication carrer: 6
Increase in the amount of information delivered	To related government organizations	869 MB/time	2,092 MB/time
	Total amount of information	1,961 MB/time	3,144 MB/time

*1 Chief of each organizations receive deisaster information as an individual rather than as organization

*2 Telecommunication carrier have not receive disaster information as Communicator to dessiminate to mobile-phone users in public

It is expected that future disaster information communication will be able to use a secure bandwith through the implementation of the Project, and telecommunication carrier companies will be added as one of the communicators of early warning information.

Quantitative impacts can be measured and the degree of progress verified by monitoring system connection records and ledgers managed by KOMINFO.

(2) Qualitative impacts

Qualitative impacts expected from the Project implementation are as follows:

- Improvement of information transmission speed
- Line congestion and transmission delay can be avoided during disaster events
- Increase of information volume
- Information volume to deliver at a time can increase .
- Improvement of the method to confirm a status of information transmission
- KOMINFO can graspe the reception status at BNPB, BPBD, mass media and telecommunication carriers.
- Improvement of the sytem of the operation to transmit disaster information
- Operation of the system can be tested and practiced through communication training during non-crisis times by implementing the communication training function in this system.

From the above, the relevance of the implementation of the Project is deemed high and the effectiveness of the Project is considered securely obtained.

[Appendices]

1. Member List of the Study Team
2. Study Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions
5. Soft Component (Technical Assistance) Plan
6. Other Relevant Data
7. References

Appendix 1

Member List of the Study

(1) Preparation Survey (17 November, 2014-05 September, 2015)

Officials

Name	Position	Organization
Norihito Yonebayashi	Team Leader	Japan International Cooperation Agency
Shintaro Akiyama	Cooperation Planning	Japan International Cooperation Agency
Takafumi Shinya	Disaster Information Communication Adviser	Ministry of Land, Infrastructure and Transport
Nobuyuki Tanaka	Monitoring and Communication System	Japan Meteorological Agency
Seiji Ono	Information and Communication Technology	Ministry of Internal Affairs and Communications

Consultants

Name	Position	Organization
Takeshi Nakano	Consultant Team Leader	Kokusai Kogyo CO.,LTD.
Shiro Makita	Disaster Information Communication	Kokusai Kogyo CO.,LTD.
Satoru Tsukamoto	Organization and Institution	Kokusai Kogyo CO.,LTD.
Hiroyuki Kozu	Information and Communication Technology	Kokusai Kogyo CO.,LTD.
Tomoyuki Ueda	Equipment Plan	Kokusai Kogyo CO.,LTD.
Tetsuya Suzuki	Cost Estimation／Equipment Plan	Kokusai Kogyo CO.,LTD.

(2) Draft Outline Design (17 January, 2016-30 January, 2016)

Officials

Name	Position	Organization
Yukihiko Ejiri	Team Leader	Japan International Cooperation Agency
Shintaro Akiyama	Cooperation Planning	Japan International Cooperation Agency

Consultants

Name	Position	Organization
Takeshi Nakano	Consultant Team Leader	Kokusai Kogyo CO.,LTD.
Shiro Makita	Disaster Information Communication	Kokusai Kogyo CO.,LTD.
Tetsuya Suzuki	Equipment Quotation/Plan	Kokusai Kogyo CO.,LTD.
Yoshiyuki Yagiri	Disaster Information Communication 2	Kokusai Kogyo CO.,LTD.

Appendix 2

Study Schedule

1st Preparatory Survey

Date		Officials	Consultants				
			Takeshi Nakano	Shiro Makita	Satoru Tsukamoto	Hiroyuki Kozu	Tomoyuki Ueda
			Team Leaderof Consultant	Disaster Information Communication	Organization/Institution	Information Communication Technology	Equipment Plan
7-Nov-2014	Fri	–	–	Traveling (Narita-Jakarta)	Traveling (Narita-Jakarta)	–	Traveling (Narita-Jakarta)
8-Nov-2014	Sat	–	–	Confirm locations of relevant organizations	Confirm locations of relevant organizations	–	Confirm location of relevant organizations
9-Nov-2014	Sun	–	–	Preparation for Survey	Preparation for Survey	–	Preparation for Survey
10-Nov-2014	Mon	–	–	Courtesy call on JICA Indonesia Office, Embassy of Japan, KOMINFO	Courtesy call on JICA Indonesia Office, Embassy of Japan, KOMINFO	–	Courtesy call on JICA Indonesia Office, Embassy of Japan, KOMINFO
11-Nov-2014	Tue	–	–	Discussion with BMKG, Discussion with PU	Discussion with BMKG, Discussion with PU	–	Discussion with BMKG, Discussion with PU
12-Nov-2014	Wed	–	Traveling (Narita-Jakarta)	Discussion with BMKG, Discussion with BNPB	Discussion with BMKG, Discussion with BNPB	Traveling (Kansai-Jakarta)	Discussion with BMKG, Discussion with BNPB
13-Nov-2014	Thu	–	Discussion with KOMINFO	Discussion with KOMINFO	Discussion with KOMINFO	Discussion with KOMINFO	Discussion with KOMINFO
14-Nov-2014	Fri	–	Compiling survey results, JICA teleconference	Compiling survey results, JICA teleconference	Compiling survey results, JICA teleconference	Compiling survey results, JICA teleconference	Compiling survey results, JICA teleconference
15-Nov-2014	Sat	–	Response to conference result	Response to conference result	Response to conference result	Modification of questionnaire	Modification of questionnaire
16-Nov-2014	Sun	Traveling (Narita-Jakarta) Survey team meeting	Survey team meeting	Survey team meeting	Survey team meeting	Traveling (Jakarta-Padang)	Traveling (Jakarta-Padang)
17-Nov-2014	Mon	Survey team meeting, Joint meeting, Courtesy call on Embassy of Japan	Survey team meeting, Joint meeting, Courtesy call on Embassy of Japan	Survey team meeting, Joint meeting, Courtesy call on Embassy of Japan	Survey team meeting, Joint meeting, Courtesy call on Embassy of Japan	Survey at BPBD West Sumatra	Survey at BPBD West Sumatra
18-Nov-2014	Tue	Discussion with BMKG, Discussion with KOMINFO	Discussion with BMKG, Discussion with KOMINFO	Discussion with BMKG, Discussion with KOMINFO	Discussion with BMKG, Discussion with KOMINFO	Survey at Reginal KOMINFO	Survey at Reginal KOMINFO
19-Nov-2014	Wed	Discussion with BNPB	Discussion with BNPB	Discussion with BNPB	Discussion with BNPB	Traveling (Padang-Bali)	Traveling (Padang-Bali)
20-Nov-2014	Thu	Discussion with BNPB	Discussion with BNPB	Discussion with BNPB	Discussion with BNPB	Survey at BPBD Bali, BMKG Bali	Survey at BPBD Bali, BMKG Bali
21-Nov-2014	Fri	Report to Embassy of Japan Survey team meeting Traveling (Jakarta-)	Report to Embassy of Japan Survey team meeting	Report to Embassy of Japan Survey team meeting	Report to Embassy of Japan Survey team meeting	Survey at NIX Bali	Survey at NIX Bali
22-Nov-2014	Sat	Traveling (-Narita)	Work adjustment	Work adjustment	Work adjustment	Traveling (Bali-Jakarta)	Traveling (Bali-Jakarta)
23-Nov-2014	Sun		Work adjustment	Work adjustment	Work adjustment	Compiling survey results	Compiling survey results
24-Nov-2014	Mon		Signing on Minutes (KOMINFO), Discussion with BMKG for Minutes	Discussion with KOMINFO, Discussion with BMKG for Minutes	Discussion with KOMINFO, Discussion with BMKG for Minutes	Discussion with KOMINFO, Discussion with BMKG for Minutes	Discussion with KOMINFO, Discussion with BMKG for Minutes
25-Nov-2014	Tue		Traveling (Jakarta-)	Survey at NIX Jakarta	Compiling survey results	Survey at NIX Jakarta Traveling (Jakarta-)	Survey at NIX Jakarta
26-Nov-2014	Wed		Traveling (-Narita)	Signing on Minutes (BNPB), Discussion with BPPT	Signing on Minutes (BNPB), Discussion with BPPT	Traveling (-Kansai)	Signing on Minutes (BNPB), Discussion with BPPT
27-Nov-2014	Thu			Signing on Minutes (BMKG)	Signing on Minutes (BMKG)		Signing on Minutes (BMKG)
28-Nov-2014	Fri			Discussion with BNPB	Discussion with BNPB		Discussion with BNPB
29-Nov-2014	Sat			Traveling (Jakarta-Bali)	Traveling (Jakarta-Bali)		Compiling survey results
30-Nov-2014	Sun			Preparation for Survey	Preparation for Survey		Compiling survey results
1-Dec-2014	Mon			Survey at BPBD Bali, BMKG Bali	Survey at BPBD Bali, BMKG Bali		Compiling survey results
2-Dec-2014	Tue			Survey at BMKG Bali Traveling (Bali-Jakarta)	Survey at BMKG Bali Traveling (Bali-Jakarta)		Discussion with KOMINFO
3-Dec-2014	Wed			Disucussion with BMKG	Disucussion with BMKG		Disucussion with BMKG
4-Dec-2014	Thu			Report to JICA Indonesia Office, Embassy of Japan	Report to Embassy of Japan, Discussion with KOMINFO		Report to Embassy of Japan, Discussion with KOMINFO
5-Dec-2014	Fri			Traveling (Jakarta-)	Traveling (Jakarta-)		Traveling (Jakarta-)
6-Dec-2014	Sat			Traveling (-Narita)	Traveling (-Narita)		Traveling (-Narita)

1.5th Preparatory Survey

Date		Officials	Consultants		
			Hiroyuki Kozu	Tomoyuki Ueda	Tetsuya Suzuki
			Information Communication Technology	Equipment Plan	Equipment Plan and Cost
6-Jun-2015	Sat		Traveling (Narita-Jakarta)	Traveling (Narita-Jakarta)	Traveling (Narita-Jakarta)
7-Jun-2015	Sun		Preparation of Document	Preparation of Document	Preparation of Document
8-Jun-2015	Mon		Discussion with KOMINFO, BNPB and BMKG Courtesy call on JICA Indonesia Office	Discussion with KOMINFO, BNPB and BMKG Courtesy call on JICA Indonesia Office	Discussion with KOMINFO, BNPB and BMKG Courtesy call on JICA Indonesia Office
9-Jun-2015	Tue		Survey at BNPB	Survey at BNPB	Survey at BNPB
10-Jun-2015	Wed		Survey at BMKG, BPBD Jakarta	Survey at BMKG, BPBD Jakarta	Survey at BMKG, BPBD Jakarta
11-Jun-2015	Thu		Survey at KOMINFO, MoHA	Survey at KOMINFO, MoHA	Survey at KOMINFO, MoHA
12-Jun-2015	Fri		Discussion with KOMINFO, Report to JICA Indonesia Office	Discussion with KOMINFO, Report to JICA Indonesia Office	Discussion with KOMINFO, Report to JICA Indonesia Office
13-Jun-2015	Sat		Traveling (Jakarta-)	Data Collection	Data Collection
14-Jun-2015	Sun		Traveling (-Kansai)	Traveling (Jakarta-)	Traveling (Jakarta-)
15-Jun-2015	Fri			Traveling (-Kansai)	Traveling (-Kansai)

2nd Preparatory Survey

Date		Officials	Consultants					
			Takeshi Nakano	Shiro Makita	Satoru Tsukamoto	Hiroyuki Kozu	Tomoyuki Ueda	Tetsuya Suzuki
			Team Leader of Consultant	Disaster Information Communication	Organization/Institution	Information Communication Technology	Equipment Plan	Equipment quotation/Plan
9-Aug-2015	Sun			Traveling (Narita-Jakarta)			Traveling (Narita-Jakarta)	Traveling (Narita-Jakarta)
10-Aug-2015	Mon			Courtesy call on Embassy of Japan and KOMINFO			Courtesy call on Embassy of Japan and KOMINFO	Courtesy call on Embassy of Japan and KOMINFO
11-Aug-2015	Tue			Courtesy call on BNPB, Survey at KOMINFO			Courtesy call on BNPB, Survey at KOMINFO	Courtesy call on BNPB, Survey at KOMINFO
12-Aug-2015	Wed			Courtesy call on PU, Discussion with BNPB			Courtesy call on PU, Discussion with BNPB	Courtesy call on PU, Discussion with BNPB
13-Aug-2015	Thu			Courtesy call on BMKG			Courtesy call on BMKG	Courtesy call on BMKG
14-Aug-2015	Fri			Courtesy call on JICA Indonesia Office, Survey at BMKG			Courtesy call on JICA Indonesia Office, Survey at BMKG	Courtesy call on JICA Indonesia Office, Survey at BMKG
15-Aug-2015	Sat			Survey team meeting			Survey team meeting	Survey team meeting
16-Aug-2015	Sun			Compiling survey results			Compiling survey results	Compiling survey results
17-Aug-2015	Mon			Compiling survey results			Compiling survey results	Compiling survey results
18-Aug-2015	Tue			Discussion with JICA Indonesian office, Survey at KOMINFO			Survey at KOMINFO	Survey at KOMINFO
19-Aug-2015	Wed			Survey at KOMINFO and BNPB			Discussion with KOMINFO, Survey at BNPB	Discussion with KOMINFO, Survey at BNPB
20-Aug-2015	Thu			Compiling survey results			Compiling survey results	Survey at KOMINFO
21-Aug-2015	Fri			Survey at BPBD			Compiling survey results	Survey at BPBD
22-Aug-2015	Sat			Compiling survey results			Compiling survey results	Compiling survey results
23-Aug-2015	Sun			Compiling survey results			Traveling (Jakarta-Medan)	Compiling survey results
24-Aug-2015	Mon			Survey at KOMINFO and BNPB			Survey at KOMINFO and BNPB	Traveling (Jakarta-Medan)
25-Aug-2015	Tue			Survey at KOMINFO and BNPB		Traveling (Kansai-Jakarta)	Survey at KOMINFO	Survey NIX Medan, BPBD Medan
26-Aug-2015	Wed	Traveling (Narita-Jakarta) Survey team meeting		Survey at Cyber Building and BMKG		Survey at Cyber Building and BMKG	Survey at Cyber Building and BMKG	Traveling (Medan-Balikpapang) Survey at BPBD Balikpapang
27-Aug-2015	Thu	Discussion with KOMINFO and BMKG	Traveling (Narita-Jakarta) Survey team meeting	Discussion with KOMINFO Survey team meeting	Traveling (Narita-Jakarta) Survey team meeting	Discussion with KOMINFO, Discussion with BMKG Survey team meeting	Discussion with KOMINFO, Discussion with BMKG Survey team meeting	Survey at NIX Balikpapang Traveling (Balik papang-Bali)
28-Aug-2015	Fri	Discussion with BMKG, Discussion with BNPB	Discussion with BMKG, Discussion with BNPB	Discussion with KOMINFO	Discussion with KOMINFO	Survey at BMKG and BPBD	Survey at BPBD	Survey at NIX Bali and BPBD Bali
29-Aug-2015	Sat	Survey team meeting	Survey team meeting	Survey team meeting	Survey team meeting	Survey team meeting	Survey team meeting	Survey at BMKG Bali Traveling (Bali-Jakarta)
30-Aug-2015	Sun	Conpiling survey results	Conpiling survey results	Conpiling survey results	Conpiling survey results	Conpiling survey results	Conpiling survey results	Conpiling survey results
31-Aug-2015	Mon	Discussion with BNPB, Discussion with KOMINFO	Discussion with BNPB, Discussion with KOMINFO	Discussion with KOMINFO	Discussion with BNPB	Survey at BNPB and BPPPTI	Survey at BNPB and BPPPTI	Survey at KOMINFO and BPPPTI
1-Sep-2015	Tue	Report to Embassy of Japan, Discussion about Minutes of Discussions with KOMINFO, BNPB,BMKG and MoHA)	Discussion with KOMINFO, Discussion with BNPB	Discussion with KOMINFO, Discussion with BNPB	Discussion with KOMINFO, Discussion with BNPB	Discussion with BMKG	Collecting equipment quotations from companies	Collecting equipment quotations from companies
2-Sep-2015	Wed	Discussion about Minutes of Discussions	Discussion about Minutes of Discussions	Discussion with KOMINFO	Discussion with BNPB	Survey at Mass Media, Discussion with BMKG	Collecting equipment quotations from companies	Collecting equipment quotations from companies
3-Sep-2015	Thu	Discussion about Minutes of Discussions	Discussion about Minutes of Discussions	Discussion with KOMINFO	Discussion with BNPB	Survey at KOMINFO	Collecting equipment quotations from companies	Collecting equipment quotations from companies
4-Sep-2015	Fri	Discussion about Minutes of Discussions Report to JICA Indonesia Office, Embassy of Japan Traveling (Jakarta-)	Discussion about Minutes of Discussions Report to Embassy of Japan Traveling (Jakarta-)	Discussion about Minutes of Discussions Traveling (Jakarta-)	Survey at KEMLHK Traveling (Jakarta-)	Survey at Telkomsel and Cyber Building Traveling (Jakarta-)	Report to JICA Indonesia Office, Embassy of Japan, Collecting Equipment quotation Traveling (Jakarta-)	Collecting Equipment quotation Traveling (Jakarta-)
5-Sep-2015	Sat	Traveling (-Narita)	Traveling (-Narita)	Traveling (-Narita)	Traveling (-Narita)	Traveling (-Kansai)	Traveling (-Narita)	Traveling (-Narita)

Draft Outline Design Survey

Date		Officials	Consultants			
			Takeshi Nakano	Shiro Makita	Tetsuya Suzuki	Yoshiyuki Yagiri
			Team Leaderof Consultant	Disaster Information Communication	Equipment quotation/Plan	Disaster Information Communication 2
17-Jan-2016	Sun		Traveling (Haneda-Jakarta)	Traveling (Haneda-Jakarta)	Traveling (Haneda-Jakarta)	Traveling (Haneda-Jakarta)
18-Jan-2016	Mon		Courtesy call on JICA Indonesia Office and KOMINFO	Courtesy call on JICA Indonesia Office and KOMINFO	Courtesy call on KOMINFO	Courtesy call on JICA Indonesia Office and KOMINFO
19-Jan-2016	Tue		Survey at KOMINFO	Survey at KOMINFO and NTT Indonesia	Survey at KOMINFO	Survey at KOMINFO and NTT Indonesia
20-Jan-2016	Wed		Discussion with Telecommunication Carriers	Discussion with Telecommunication Carriers	Discussion with Telecommunication Carriers	Discussion with Telecommunication Carriers
21-Jan-2016	Thu		Site Survey at Telkom DC, Discussion with BNPB, Discussion with BMKG,	Site Survey at Telkom DC, Discussion with BMKG	Site Survey at Telkom DC, Discussion with BNPB, Discussion with BMKG,	Site Survey at Telkom DC, Discussion with BMKG
22-Jan-2016	Fri		Discussion with KOMINFO	Survey at BPPPTI and NTT Indonesia	Discussion with KOMINFO	Survey at BPPPTI and NTT Indonesia
23-Jan-2016	Sat		Survey team meeting	Survey team meeting	Survey team meeting	Survey team meeting
24-Jan-2016	Sun	Traveling (Narita-Jakarta)	Conpiling survey results	Conpiling survey results	Conpiling survey results	Conpiling survey results
25-Jan-2016	Mon	Survey team meeting Discussion with KOMINFO	Survey team meeting Discussion with KOMINFO	Survey team meeting Discussion with KOMINFO	Survey team meeting Discussion with KOMINFO	Survey team meeting Discussion with KOMINFO
26-Jan-2016	Tue	Survey at KOMINFO Discussion with BMKG	Survey at KOMINFO Discussion with BMKG	Survey at KOMINFO Discussion with BMKG	Survey at KOMINFO	Survey at KOMINFO
27-Jan-2016	Wed	Discussion about Minutes of Discussions	Discussion about Minutes of Discussions	Discussion about Minutes of Discussions	Conpiling survey results	Conpiling survey results
28-Jan-2016	Thu	Survey at BPBD Jakarta Site survey at Data Centers	Conpiling survey results	Survey at BPBD Jakarta Site survey at Data Centers	Conpiling survey results	Conpiling survey results
29-Jan-2016	Fri	Report to JICA Indonesia Office, Embassy of Japan Traveling (Jakarta-)	Report to Embassy of Japan Traveling (Jakarta-)	Site survey at data center of NTT Indonesia Traveling (Jakarta-)	Conpiling survey results Traveling (Jakarta-)	Conpiling survey results Traveling (Jakarta-)
30-Jan-2016	Sat	Traveling (-Narita)	Traveling (-Narita)	Traveling (-Narita)	Traveling (-Narita)	Traveling (-Narita)

Appendix 3

List of Parties Concerned

in the Recipient Country

(1) Ministry of Communication and Information Technology（KOMINFO）

Dr. Ir. Ismail, MT	Deputy Director General for Special Telecommunication, Public Broadcasting and Universal Service Obligation
Mr. Harapan Takaryawan	Deputy Director for Private Special Telecommunication
Mr. Wayan Toni Supriyanto	Deputy Director for Special Telecommunication for Government
Mr. Wibi Noviardi	Staff of Special Telecommunications
Mr. Agus Joko	Staff of Special Telecommunications
Mr. Joko	Staff of Special Telecommunications
Mr. Marvels	Staff of Special Telecommunications
Mr. Rahadian	Staff of Special Telecommunications
Mr. Trishad	Staff of Special Telecommunications

(2) Meteorological, Climatological and Geophysical Agency（BMKG）

Jakarta

Dr. M.Riyadi	Director for Earthquake and Tsunami Center
Dr. Daryono	Head of Earthquake and Tsunami Mitigation Division
Dr. Wandono	Head of the Early Information Division
Mr. Canto Nugrorio	Head of Tsunami Management Sub-Division
Mr. Taufik Gunawan MSC	Head of Earthquake and Tsunami Operation Division
Mr. Tiar. Prasetta	Head, Management Earthquake Operation Sub Division
Mr. Wirjayanto	Head of Earthquake and Tsunami Mitigation Sub-Division
Mr. Sutiyono	Head of Sub-division Earthquake Information
Dr. Sujabar	Staff, Earthquake & Tsunami Operation Management Division
Mr. Agie Wandala Puma	Public Weather Service Division
Mr. Ajat Sudrajar	Staff, Earthquake Management Operation Division
Mr. Canyo Ngurgrobo	Earthquake and Tsunami Operation Division
Mr. Januar Arifin	Staff, Earthquake Management Operation Division
Mr. Priyobudi	Staff, Tsunami Mitigation Division
Mr. Taryono	Public Weather Service Division
Mr. Yedi Dermadi	Staff, Earthquake Management Operation Division
Ms. Nurjanah Anah	International Cooperation Division
Ms. Weniza	Staff, Tsunami Mitigation Division

Bali

Mr. I Wayan Suardano	Haed of Bali Province BMKG
Mr. Asrori	Head of Observation Division
Mr. Inyoman Wiryajaya	Head of Data Information Division
Mr. Ardhi	Earthquake analyst
Mr. Kadek	Earthquake analyst
Mr. Suprajaya	Earthquake analyst
Mr. Ardianto Septiadhi	Staff of Data Information Division
Mr. Ikodek Oca Sannka	Staff of Data Information Division
Mr. Saiful Rohman	Engineer InaTEWS

Padang

Mr. Buha M. Simanjuntak	Chief of Data and Information Section
Mr. Fajar Dwi Prasetyo	Chief of Observation Section
Mr. Fajar Suryanto	Chief of Administration
Mr. Hamdi Afirin	Staff of Observation Section

(3) National Disaster Management Agency（BNPB）

Dr. Sutopo Purwo Nugroho	Head for Data, Information & Public Relation Center
Mr. Medi Herlianto	Director of Preparedness
Dr. Ir. Tri Budiarto	Deputy Director, Rehabilitation & Reconstruction
Dr. Ir.Agus Wibowo	Head of Data Division GIS and RS Specialist
Mr. Alang Supena	Information Staff
Mr. Haryono Hansen Sirait	Assistant for JICA Expert on Disaster management Policy
Mr. Sridewanto SSI	GIS Analist
Mr. Tono Suunarson	Operation Planning Section, Subdirectorate Rescue & Evacuation
Mr. Wing Prasetyo. A	Evacuation Section, Subdirectorate Rescue & Evacuation
Mr. Yus Rizal	Subdirectorate Rescue & Evacuation
Ms. Dyah	Sub-Division of Network Management System
Ms. Dyar Rusmiasih	Heard, Subdivision of Network
Ms. Linda Lestari	Sub-Division of Network Management System
Ms. Noviyanti Erfien Kaparang	Assistant for JICA Expert on Disaster management Policy
Mr. Takafumi Shinya	JICA Expert on Comprehensive Disaster Management Policy

(4) Regional Disaster Management Agencies（BPBD）

Jakarta

Mr. Bambus Sp.	Head of BPBD Jakarta
Mr. Basuki Rakhmat	Head of Controling Section
Mr. Rahmat Kurniawan	Informatics and Controlling Division
Ms. Helman Dahilia	Head of Infomatics Section

Bali

Mr. Made Sudhama	Head of District BPBD Bali (District)
Mr. Nyoman Wanjaya	Head of Data & Information Sub-Division
Mr. Igm Mode Jaya	Head of PUSDALOPS
Dr. Hi Putu Sri Tirtayati	Medical Doctor of Emergency Service Response
Dr. Ida Bagus Martha	Medical Doctor of Emergency Service Response
Mr. Bendi Widjaya	Staff of ESR
Mr. I B Gd Widnyaya	Staff of Crisis Center
Mr. Ikomang K. Eoi	Staff (Province)
Mr. Junivon	Staff of Crisis Center
Mr. Made Pacpta	Staff (District)
Mr. Putu Agus Wijaya	Staff of Crisis Center
Mr. Wiana	Staff of ESR
Ms. Kadik Novi Dwisantiari S Kep	Nurse of ESR
Ms. Ni Luh De Ema Juniasti	Nurse of ESR

Balikpapan

Mr. Ambu Dai	Secretary of District BPBD Balikpapan (District)

Medan

Mr. Nirwan	Head of District BPBD Medan (District)
Mr. M. Alvin. P	Staff (District)

Padang

Mr. Dodi Y.	Chief of Prevention
Mr. Zulfianto	Chief of Rehabilitation and Reconstruction
Mr.Mohamad Dira	Chief of Programme and Planning
Mr. Rumainur	Chief of Prevention and Preparedness
Mr. Yazid Fadli	Chief Exective
Mr. Yuli Ermah	Chief of Employment
Mr. Almaizoh	Logistics
Mr. R. Pagar Hegara	Emergency and Logistics
Mr. Suryadi	Staff of Reconstruction Dept.
Mr. Yusra Agustin	Emergency and Logistics

South Surawesi

Mr. Apancautp	Head of Province BPBD South Surawesi (Province)
Mr. Rahamawnk	Staff (Province)

Papua

Drs. Didu Arps Prinarno	Secretary of Province BPBD Papua (Province)
Mr. Welliant. R	Staff (Province)

(5) Telecommunication and Informatic Provider and Funding Management Agency （BPPPTI）

Mr. Dhia A. Febriansa	Director for Telecommunication & Informatic Providing
Mr. Danny Januar	Provision Director
Mr. Agus	General Division
Mr. Aradeq	Provision Staff
Mr. Darien Aldiano	Legal and Public Relation Division
Mr. Faisar Arman	Inflastructure Sp
Mr. Harris. S	Provision Staff
Ms. I Gusti Ayu F.A	Legal and Public Relation Division

(6) Ministry of Public Works（PU）

Hirohisa Miura	Japan Water Agency
Kunihiro Moriyasu	JICA Water Resources Policy Advisor

(7) Agency for the Assesment and Application of Technology (BPPT)

Mr. A.Wicaksono	Group Leader of Tsunami Early Warning System Data Center

Mr. Arnord	Leader of Mooring System
Mr. Iyan Turyana	Chief Engineer of Tsunami Early Warning System
Mr. Bambang Surbangyo	Technical Engineer
Mr. Nosirwko	Program manager
Mr. Udrekh KH	Researcher of Marine Geoscience
Ms. Velly Asvaliantina	Data Analysis and Monitoring

(8) TELKOMSEL

Mr. Dindin Karyadi	Manager National Account 2
Mr. Gatut S. Wahyudi	Senior Government Account Executive
Mr. P Halomoan Sinaga	Regulatory Account Manager
Mr. Pangkas Untea	
Mr. Sholeh. Handiansyah	

(9) Telkomsigma

Mr. Yunan Suryana	Head of DC Business Development & Solution
Ms. Septy Aini Cholida	Business Data Center & Managed Services
Mr. Cuk Krisna. S	
Mr. Gatot S. Wahyudi	
Mr. Pungkas	
Mr. Sofian Tri. S	
Ms. Farah Lisamya	

(10) Indosat Ooredoo

Mr. Kusmajadi M. Hapid	Div. Regulatory Planning & Analysis Mobile Regulation Analysis
Mr. Muhammad Hazmy	CoreNetwork O & M Center Division
Ms. Elly Noor Qomariyah	Division Head Government & Industrial Relations
Mr. Alief Arafyouto	
Ms. Lisa Kanti	

(11) RT.MORA TELEMATIKA INDNESIA

Mr. Nurhayatul Arifin	Head NDC
Mr. Faizal Rizal	Infrastructure Supervisor
Mr. Eddy Siahaan	VP Operation

(12) PT Hutchison 3 Indonesia

Mr. Alief Debyatman	Deputy GM Enterprise Architecture

(13) PT TRITECH

Mr. Ade Wahyudin	Consultant
Mr. Galeh A.	Consultant
Mr. Nanang S.	Consultant
Mr. Rizky Satria	Consultant

(14) NTT Indonesia

Mr. Akihiko Igarashi	Director for Cloud Services
Mr. Tetsu Nakata	Division Manager for General Administration Division
Mr. M. Dahlan	Data Center Manager
Mr. Erland Januar Kirim	Presales Manager
Mr. Kurnia Yuriasty	Sales Exective

(15) Embassy of Japan inIndonesia

Kyotaro Maeda	First Secretary

(16) JICA Indonesia Office

Tetsuya Harada	Senior Representative
Yuki Aratsu	Senior Representative
Shigeki Ishigaki	Advisor
Hideki Katayama	Advisor

Appendix 4

Minutes of Discussions

Appendix 4-1

Minutes of Discussion on November 24, 2014

MINUTES OF DISCUSSIONS
ON
THE FIRST MISSION OF THE PREPARATORY SURVEY
ON
THE PROJECT FOR INDONESIA ICT DISASTER PREVENTION PACKAGE
IN THE REPUBLIC OF INDONESIA

In response to a request from the Government of the Republic of Indonesia (hereinafter referred to as "GOI"), the Government of Japan decided to conduct the Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Indonesia ICT Disaster Prevention Package (hereinafter referred to as "the Project") and entrusted the survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the first mission of the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Norihito YONEBAYASHI, Director of Disaster Management Team 2, Global Environment Department, JICA, and consists of JICA staff, members from ministries of Japan and consultant members. The first mission was scheduled to stay in the country from November 16 to 21 for JICA and members from ministries, and November 7 to December 5 for consultant members respectively.

The Team held discussions with the officials concerned of the GOI and both parties confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Jakarta, November 24, 2014

Mr. Norihito Yonebayashi
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Dr. Ir. Ismail MT
Deputy Director General for Special
Telecommunication, Public Broadcasting
and Universal Services Obligation
Ministry of Communication and
Information Technology

Dr. Sutopo Purwo Nugroho
Head of data, information & Public
Relation Center
National Disaster Management Agency

Mr. Mochammad Riyadi
Director for Earthquake & Tsunami
Center
Meteorological Climatological and
Geophysical Agency

ATTACHMENT

1. Purpose of the first mission of the Preparatory Survey

The Team explained the purpose of the first mission of the Preparatory Survey that:

(1) to confirm the feasibility of the request;

(2) to collect information for confirming relevance, effectiveness and efficiency, etc. and making counter proposal if necessary in order to fit to the capacity of Indonesia and Japan's Grant Aid project; and

(3) to decide whether or not the second mission will be dispatched based on the result of the first mission.

Indonesian side understood the explanation by the Team and accepted it.

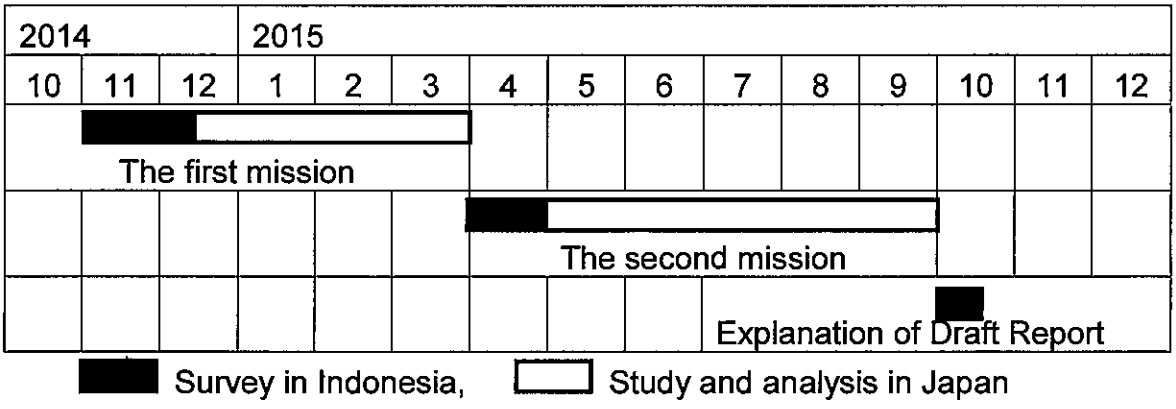
2. Outline design of the Project

The Team explained that outline design which includes specification, location and number of the each equipment, etc. will be studied in the second mission of the Survey.

3. Overall schedule of the Survey

The Team explained the overall tentative schedule of the Survey as shown below and Indonesia side understood and accepted it.

Tentative schedule



4. Target hazards

Both sides agreed on the target hazards as earthquake and tsunami.

5. Target for pilot area

Both sides agreed that the Team will propose the target for pilot area at the commencement of the second mission according to the result of first mission and the

criteria to select the site are as follow.

Criteria to select the sites:

1) Disaster-affected area in the recent period
2) High risk area on earthquake and/or tsunami
3) Well-prepared area of ICT facilities
4) Recommendation area by relevant organizations, etc.

The Project will cover just pilot province and area(s), and the responsibility to disseminate the System throughout the country is Indonesian side. The Team might propose to exclude the part between local administration and the community and focus on the part in central government and between central government and local administration in case that the Team finds difficulty on feasibility in any option.

6. Responsibility of the Project

Both sides confirmed the responsibility of the Project as follow.

KOMINFO: Transmitting the hazard and disaster information and operating and maintaining the System introduced by the Project

BNPB: Providing value added information regarding the disaster based on the analysis and information from field and evacuation instruction to BPBD

BMKG: Providing earthquake information and tsunami warning to KOMINFO

Detail role and responsibility will be decided in the second mission.

7. Findings by the Team

The Team explained their findings on the Project as follow.

7-1 Policy, plan and official responsibility regarding disaster risk reduction would be analyzed by the Team.

7-2 Necessity of back-up system should be considered in the Study.

7-3 Place of the equipment to be set up should be examined in the Study.

7-4 Dissemination channel from KOMINFO to BPBD and other governmental organization should be considered for the enhancement of the outcome of the Project.

7-5 The concept of the Project should be included in policy or the related plan of BNPB.

Member list of the first mission of the Preparatory Survey

	Name	Assignment	Organization
JICA and members from ministries of the Government of Japan			
1	Norihito YONEBAYASHI (Mr.)	Head of the mission	Director Disaster Management Div. 2, Global Environment Dept., JICA
2	Hideaki MATSUMOTO (Mr.)	Project Planning	Disaster Management Div. 2, Global Environment Dept., JICA
3	Hiroshi MURAYAMA (Mr.)	Country Planning	Southeast Asia Division 1, Southeast Asia and Pacific Department, JICA
4	Seiji ONO (Mr.)	Information and Communication Technology	Deputy Director International Cooperation Div., Global ICT Strategy Bureau, Ministry of Internal Affairs and Communications
5	Takafumi SHINYA (Mr.)	Disaster Information Communication	River Planning Division, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism
6	Nobuyuki TANAKA (Mr.)	Observation and Provision of Information	Senior Coordinator for International Cooperation Office of International Affairs, Administration Dept., Japan Meteorological Agency
Consultant members			
7	Takeshi NAKANO (Mr.)	Team Leader of the consultant	Kokusai Kogyo Co., Ltd
8	Shiro MAKITA (Mr.)	Disaster Information Communication	Kokusai Kogyo Co., Ltd
9	Satoru TSUKAMOTO (Mr.)	Institutional Responsibility	Kokusai Kogyo Co., Ltd
10	Tomoyuki UEDA (Mr.)	Institutional Responsibility	Kokusai Kogyo Co., Ltd
11	Hiroyuki KOZU (Mr.)	ICT	YSK Consultants Co., Ltd

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防災情報処理伝達システム整備計画
無償資金協力プロジェクト

MINISTRY OF COMMUNICATION AND INFORMATIO
REPUBLIC OF INDONESIA
SECRETARIAT GENERAL
"Towards The Indonesian Information Society"
KOMINFO
Jl. Medan Merdeka Barat No. 9 Jakarta 10110, Tlp/Fax +62-21 3842383 www.kominfo.go.id

Our Ref　: 797 /KOMINFO/SJ/PR/2013　　Jakarta, August 15 , 2013
Attachment　: 1 (one) exp
Title　:Proposal for Grant of ICT Disaster Management Systems

Embassy of Japan in Indonesia
Attention :H.E. Mr. Shigeru Ushio
Minister for Economic Affair & Development

At Jakarta

Dear Sir,

With reference on Minutes of Meeting on the collaboration of ICT disaster management system between The Ministry of Communication and Information Technology of the Republic of Indonesia and The Ministry of Internal affairs and Communications of Japan, in Jakarta, on 29th of April, 2013, we herewith would like to submitted the proposal of grant for Indonesia ICT Disaster Prevention Package.Application form of proposal"Indonesia ICT Disaster Prevention Package" please see attachment.

Disaster Early Warning System that will be granted this already conducted trials (feasibility study) in collaboration with the National Disaster Management Agency (BNPB) and Climatology Meteorology and Geophysics Agency (BMKG). From the result of these trials, the BNPB and BMKG welcome if the Government of Japan intends to give (grant) the Disaster Early Warning System to be implemented in Indonesia.

We would be very much appreciate if you would accept our proposal.

Thank-you very much for your kindly attention and cooperation.

Very truly yours,

SUKI YUSUF ISKANDAR
Secretary General
Ministry of Communication and Information Technology
Republic of Indonesia

cc.

1. Minister for Communication and Information Technology (as a report);
2. Deputy Minister for Development Funding, BAPPENAS;
3. Deputy Minister for facilities and infrastructure, BAPPENAS;
4. Director General of Debt Management, Ministry of Finance;
5. Director General of Postal and Information Technology Services.
6. Chief Representative JICA – Indonesia, Jakarta

Minutes of Meeting
On the Collaboration of ICT disaster management systems
between
The Ministry of Communication and Information Technology of the Republic of Indonesia and The Ministry of Internal Affairs and Communications of Japan

The Ministry of Communication and Information Technology (MCIT) of the Republic of Indonesia and The Ministry of Internal Affairs and Communications (MIC) of Japan (hereinafter referred to as "the two Ministries") recognized the necessity of disaster management systems using ICTs and the importance of international collaborations on this field.

The two Ministries will move towards the realization of ICT disaster management systems in Indonesia based on the pilot projects that were carried through collaboration between Indonesia and Japan. Further, the two Ministers would focus on the emergency alert dissemination systems and the mobile digital television for Universal Services Obligation (USO) aiming the bridging the digital divide in rural areas in the field of broadcasting technology.

To enhance the bilateral collaboration of ICT disaster management systems, the two Ministries will implement the following activities:

- Continue discussion on both the technical and regulations aspects toward the further collaboration.
- Set up a workshop as a place for a discussion, with the cooperation of experts and related government agencies of Indonesia and Japan.
- Japan will implement a feasibility study on the implementation of ICT disaster management in Indonesia

All initiatives and activities mentioned above are to be conducted in accordance with the prevailing laws in respective countries.

This English written of Minutes of Meeting adopted in Indonesia, on 29th of April, 2013.

H.E. Ir. H. Tifatul Sembiring,

Minister for Communication and Information Technology,
Republic of Indonesia

H.E. Mr. Yoshitaka SHINDO

Minister for Internal Affairs and Communications, Japan

Minutes of discussion
On the Collaboration of ICT disaster management systems
between
The Ministry of Communication and Information Technology of the Republic of Indonesia,
The Agency for Meteorology, Climatology and Geophysics of the Republic of Indonesia,
The National Board for Disaster Management of the Republic of Indonesia
and
The Ministry of Internal Affairs and Communications of Japan

The Ministry of Communication and Information Technology of the Republic of Indonesia, The Agency for Meteorology, Climatology and Geophysics of the Republic of Indonesia, The National Board for Disaster Management of the Republic of Indonesia and The Ministry of Internal Affairs and Communications of Japan (hereinafter referred to as "the four Parties") recognized the necessity of disaster management systems using ICTs and the importance of international collaborations on this field.

To enhance the bilateral collaboration, the four Parties start a meeting about introduction of ICT disaster management systems with experts and related government agencies of The Republic of Indonesia and Japan. The main topics of the meeting are as follows:

- Issues related to ICT disaster management systems
- Time schedule toward the introduction of actual systems

This Minutes of Meeting is written in English, and adopted in Indonesia, on 29th of April, 2013.

Drs.Syukri Batubara, MH

Director General of Postal and Information Technology Services
The Ministry of Communication and Information Technology of the Republic of Indonesia

Drs.Suhardjono, Dipl SEIS

Director, National Earthquake and Tsunami Warning Center
The Agency for Meteorology, Climatology and Geophysics of the Republic of Indonesia

Dr. Sutopo Purwo Nugroho

Head for Data, Information and PR Center
The National Board for Disaster Management of the Republic of Indonesia

Mr. Eiichi Tanaka,

Vice-Minister for Policy Coordination
(International Affairs)
The Ministry of Internal Affairs and Communications, Government of Japan

Application Form for Grant Aid from JAPAN

1. **Country**

The Republic of Indonesia

2. **Date (dd/mm/yy)**

3. **Requesting Department/Ministry**

(1) Name of the department/ministry in charge of this application
Directorate of Special Telecommunications, Public Broadcasting, and Universal Service Obligation
Directorate General of The Post and Information Implementation
Ministry of Communications and Information Technology

(2) Name and official position of the person in charge of this application
Ir. Woro Indah Widiastuti

(3) Postal address, Telephone/Fax number, E-mail address
Jl. Medan Merdeka Barat No. 9 Jakarta 10110;
Telp/Fax: +62-21-34830708;
email: woro@postel.go.id

4. **Project/program title**

Indonesia ICT Disaster – Prevention Package

5. **Background of the request**

(1) Name of the sector

Ministry of Communications and Information Technology

(2) Current situation and problems of the proposed sector

Indonesia is the largest archipelago country in the world frequented by various natural disasters such as earthquakes, local tsunami, volcanic eruptions, floods/debris flows, landslides, slope failures and wildfires. Disasters inhibit the steady development of the economy and the society, and in order to expose the massive hidden potential of Indonesia and realize sustainable development, disaster reduction effort is indispensable. Indonesia Government has been taking "disaster reduction" measures both hardware and software methods for long time.

As an earthquake followed by tsunami happened in Aceh on December 26, 2004, all the facilities and the infrastructure of Nanggroe Aceh Darussalam and North Sumatera has been destroyed. Such disasters not only destroyed the property but also give the life instability of the people of Aceh. Many people lost their family, many children lost their parents. This very bad condition is caused by the weakness of early warning

system to the movement of nature condition, as well as the weakness of the distribution of the instant and accurate early information of any hazardous events.
To prevent this disaster not to happen again in the future, it is time for us to prepare ourselves with an appropriate system and equipment. We believed that with an excellent warning system with a perfect distribution will enable us to have sufficient preparation prior the disaster.
Nowadays Indonesia which has many disaster potential areas spreading throughout the country still no sufficient devices to disseminate and socialize information concerning disasters and statement of them as fast and correct as possible to the people living in disaster potential areas.
There are some important problems related to disaster information collection, decision-making based on disaster information and distribution of disaster information as follows:

-It takes ***5 minutes*** or even more for inhabitant to get the disaster provisional information. In the case of an earthquake on 4 July 2013, BMKG (Agency for Meteorology, Climatology and Geophysics) issued a warning within 5 minutes of the occurrence. However, Metro TV broadcast the warning in 20 minutes after the quake.
-Inhabitant cannot get ***warning*** on disaster prevention and also ***news and information*** for better life ***in many remote islands.***

On the other hands, Indonesia's e-Gov infrastructure has been developed strongly and rapidly by KOMINFO (Ministry of Communication and Information Technology). And the meeting with Japanese Internal Affairs and Communication Minister and Indonesian Information and Communication Minister has reached an agreement on early introduction of Japanese disaster prevention ICT system.

Especially Japan's disaster prevention platform developed based on rich experiences from the Great East Japan Earthquake, the Great Hanshin Earthquake and so on enables fast decision of evacuation instruction and wider distribution of alert/evacuation instruction by utilizing KOMINFO's e-Gov infrastructure.

The big items to be solved among the above main problems to utilizing e-Gov infrastructure are considered followings;
-The basic disaster information shall be disseminated timely and ***automatically*** without human's decision.
-All the disaster information shall be collected ***one place and managed to disseminate*** surely and timely to utilized ***Standard Operation Protocol (SOP)***.

(3) Other particular data/information related to the sector

The number of disaster incidents reached almost 2,000 in 2010 in Indonesia. The trend of increase of disaster incidents is obvious due to global earth climate change. The number of disaster incidents in 2009 reached 10 times compared to the data in 2002.
Reference: Disaster Data of Indonesia 2011 (BNPB: National Agency for Disaster Management)

The great earthquake of magnitude 9.1 hit off Sumatra on 26/12/2004 and more than 10 meters of huge tsunami occurred.

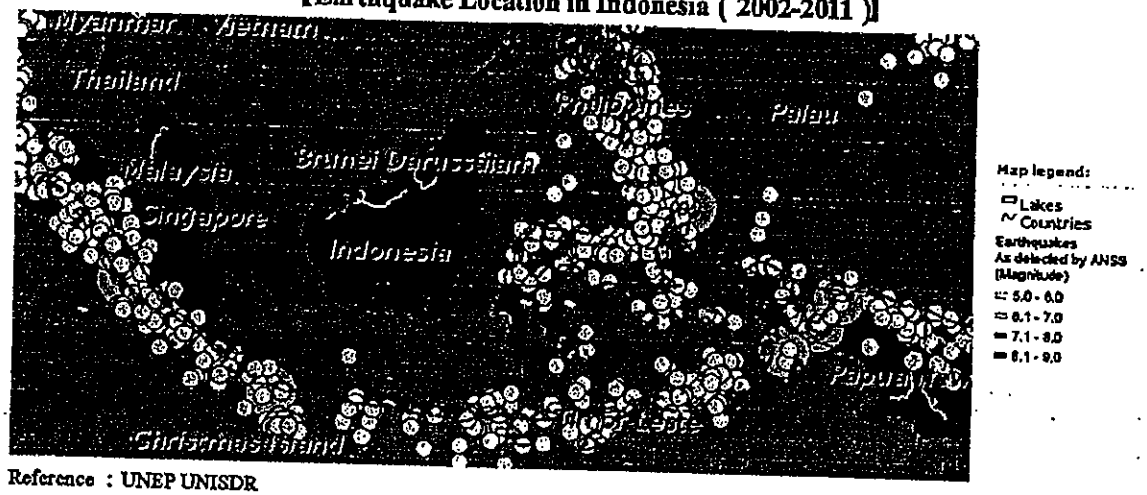
Among disaster-affected countries, the most number of victims were sacrificed in Indonesia. More than 131 thousand people died. At most 100 thousand people were injured. More than 37 thousand people were missed.

Because the people in the disaster-affected area did not experience large earthquakes and tsunami for a long time, alerts and attention were not adequately distributed, which made heavy loss in people.

At that point, facilities and methods for delivering disaster information were not adequately deployed and no ICT systems were installed for this purpose. As a result, disaster information was not distributed to some locations. Uncertain rumors were even spread out, which made inhabitants quite confused.

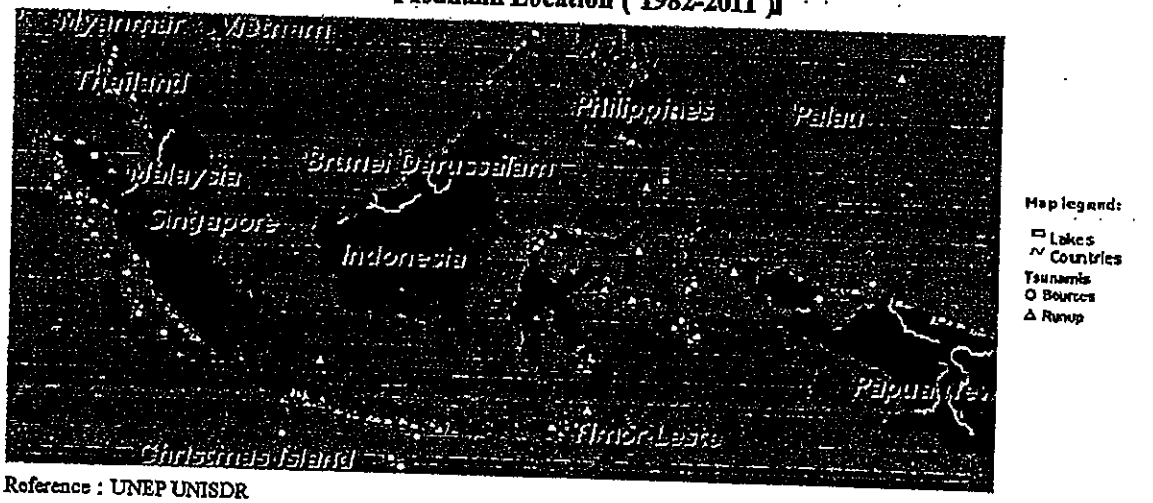
The detail earthquake and Tsunami location happened in Indonesia are shown below maps;

[Earthquake Location in Indonesia (2002-2011)]



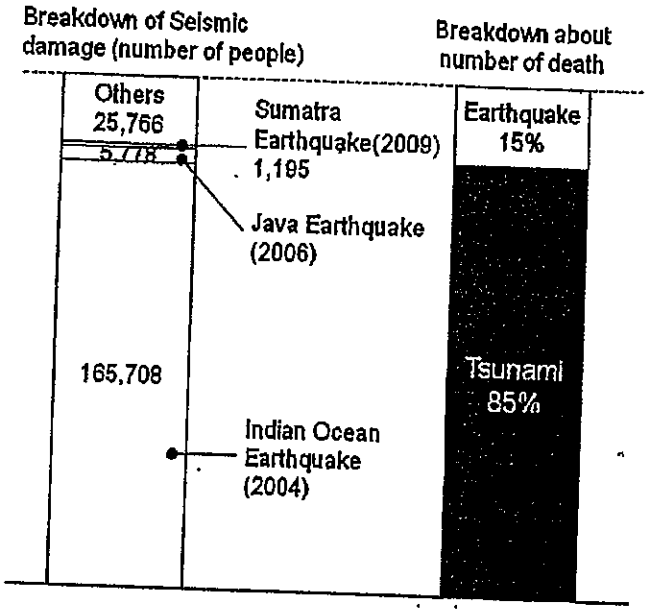
Reference : UNEP UNISDR

[Tsunami Location (1982-2011)]



Reference : UNEP UNISDR

The breakdown of seismic damage is shown below;



(4) Relationship between the project/program and any national development plan

1) The Government of Indonesia has prioritized the control and management of natural disaster risks in its *National Medium-Term Development Plan* (RPJMN 2010-2014).

Disaster management is the top priority of the Government of the Republic of Indonesia, due the frequent happened big natural disaster (Tsunami, Earthquakes and others) for past few years. When the disaster happened, the government was criticized by the public for the lack of the coordination among the related institutions in the meaning of the preventive and counter measures, warning for evacuation of the people of the area, information dissemination and relief activities to the public.

2) According to *e-Government* strategy in Indonesia, following development plan was developed related to proposing project;

-To build the information portals and integrated public services, to build the electronic document management system, standardization and information security system;

- To develop management system of central and local government. The focus is to improve the quality of services needed by the community, to manage the changes.

-To optimize the use of information technology. The focus is on building the interoperability, standardization and procedure of electronic document management system, information security, basic applications and to develop intergovernmental network.

- To enhance the levels of information technology capabilities and accessibility of rural area and more than 240 million people living in thousands of islands.

(5) Relationship between the project/program and any sector development plan

There is manual and instruction of institutions which handles disasters-related information and responsibilities in the case of emergencies. The institutions should have their own manuals on how to process the information with their responsibilities and rights when they received disaster-related information from another institution or information resources as describe below:

- How to deliver the disaster related information to what institutions or the general public?
-Does the institution process something on the data?
-What kind of action the institutions should they take?
- What should decide to deliver this information to the others?

There are some important development plans of other sectors as follows:

1) Balai Penyedia dan Pengelolaan Pembiayaan Telekomunikasi dan Informatika (BP3TI: Office for Telecommunications and Informatics Financial Provision and Management), agency under the KOMINFO started the following ICT development program to follow e-Government strategy
-***Nusantara Internet Exchange (NIX)*** and NIX data center has been developed in 33 provinces.
-***Palapa Ring optical fiber network*** has been connected among above 33 NIX to cope with governmental communication needs.
Above governmental network can be used for monitoring and dissemination of disaster prevention system.

2) Badan Nasional Penanggulangan Bencana (BNPB) issued the ***Tsunami Disaster Reduction Masterplan*** directed by the President of Indonesia in 2012. The Programs are follows;
-Strengthening of early warning chain
-Development and improvement of temporary location of evacuation
-Strengthening of preparedness capability and disaster risk reduction
-Self-reliance development of industrial instrumentation disaster
Related to proposing project, communication and dissemination facilities are planned in this master plan.

3) Meteoroligical, Climatological, Geophysical Agency (BMKG) have a development plan of existing ***Indonesia Tsunami Early Warning System (InaTEWS)***. Enhancement of monitoring system is developing. Existing (2013)status and Target are follows;
-Seismograph: 163(Existing) to 200 (Target)
-Accelerograph: 216 (Existing) to 500 (Target)
-Intensity Meter: 56 (Existing) to 600 (Target)
-DARTBuoy: 25 Buoys (Target) (the sensor owned by BPPT)
-Tide Gauge: 58(Exsisting) to 80 (Target) (the sensor owned by Badan Informasi Geospasial: BIG, Agency of Geospatial Information)
GPS: 20 (Existing) to 40 (Development) (the sensor owned by BIG)

6. Objectives of the project/program

(1) Overall goal

The overall goal of this project is to achieve:

1) The basic disaster information are disseminated ***timely and surely.***
2) Inhabitant can get ***warning*** on disaster prevention and also ***news and information*** for better life ***in many remote islands.***
3) ***One place management*** of disaster information
4) Effective ***SOP*** and smooth decision-making process for evacuation
5) ***Effective use of KOMINFO's e-Gov infrastructure*** for disaster mitigation
6) Fast and accurate disaster information dissemination to ***all the country*** including rural area and remote islands ***in Indonesia.***
7) To ***lead*** to use common and standard disaster information system in ***ASEAN countries.***

(2) Project/program purpose

The proposing project purposes are summarized as follows;

1) BMKG supplies earthquake/tsunami information to servers at Data Center of KOMINFO in Jakarta and BNPB manages those contents (information) at the Data Center.
2) The practical, pioritarized and piloted project will cover BNPB and leading BPBD in ***West Sumatra,*** but the package will be easily expandable to all over the areas in Indonesia.
3) Reducing throughput time to get disaster information will be ***less than 30 seconds*** (3 minutes in case of remote islands) by ***full-automatic operations*** with operating collection, processing and distribution of disaster information continuously and automatically.
4) For one place management effectively, disaster information and data will be ***obtained from some systems of governmental agencies*** such as BMKG, BNPB, PU (Ministry of Public Works), ESDM (Energi dan Sumber Daya Mineral; Ministry of Energy and Mineral Resources), local governments, etc. The edited and/or processed data will be ***distributed from the KOMINFO Data Center in Jakarta to various media promptly (such as data, voice and picture)*** with no or some human operations.
5) Prompt and adequate communication of ***COP (common operational picture)*** among central government, local governments and related agencies will be established by incorporating the current systems, facilities and equipments already installed in Indonesia.
6) Inhabitant in remote islands will be able to get warning information on disaster prevention and also news and information for better life in many islands ***to use one seg terminal with solar system.***

7. Outline of the project/program

(1) Amount of the request (Yen) and a rough breakdown

"Indonesia ICT Disaster – Prevention Package" is consisted of the items below;

	Item (Organization of Ownership)	Cost (1,000 Yen)
Equipment	Center System : 1unit (KOMINFO)	635,500
	Area Control System: 1unit (BPBD)	635,500
	Operation Terminal(BNPB JKT): 1unit (BNPB)	1,700
	Operation Terminal(BPBD Padang): 1unit (BPBD)	1,700
	Transmitter and Disaster Information Receiving Units 1 units (MENKOKESRA; Coordinating Ministry for Peoples' Welfare)	44,800
	Transmitter for Radio Speaker System 1 units (BPBD)	44,800
	Transmitter for TV broadcasting 1 units (TVRI) (TBC)	183,100
	Transmitter for Multiple Media 1 units (BPBD)	44,800
	Rural Area Option of Transmitter for Multiple Media 1 units (BPBD)	106,300
	Transmitter for service delivery platform 1 units (Telkomsel) (TBC)	124,000
	Sub-total	1,822,200
Soft (Non physical) Components	Establish Disaster management Plan Conduct the small drills using system Workshop	11,800
Design/Supervision		165,300
Grand total		1,999,300

Note1: The Package (Indonesia ICT Disaster – Prevention Package) is to be installed and operated in a communication environment prepared by governmental agencies in Indonesia. The operation environment will be determined based on the discussion with Indonesian agencies.

Note2: The service level of the Package will be determined based on the discussion referred to in the Note 1.

Note3: One data source of the Package is considered to be InaTEWS. The Package is the platform that enables easy connections to other systems.

Note4: However, whether the Package will be connected to other systems is not determined yet. In case of connecting the Package to other systems, further details need to be determined regarding specific systems to connect to, the potential necessity of the system retrofits, retrofit methods, additional budgets, etc. These details will be discussed at the stages of investigation and Basic Design (BD).

Note5: The Amount of the request does not include taxes imposed in Indonesia or Japan.

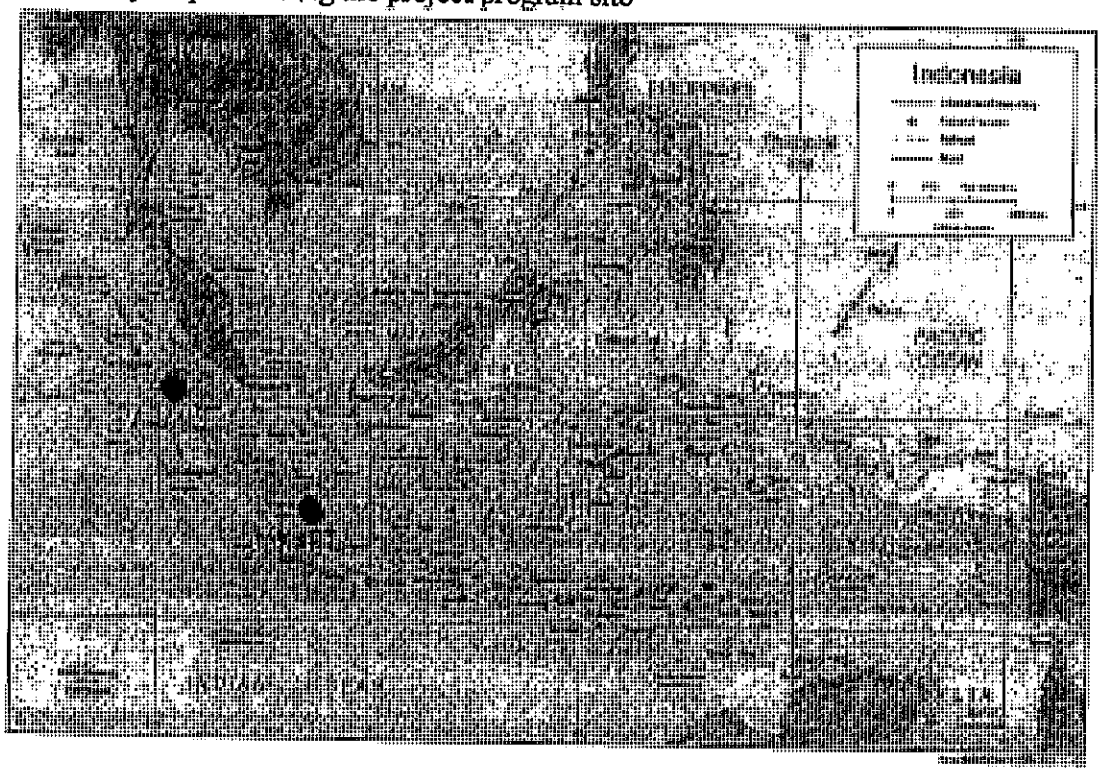
Note6: The Amount of the request is on a yen basis.

Note 7: Consumption taxes are not included.

Note 8: As for preconditions of the Package, please refer to "7. (2) Imposed Preconditions Concerning Development of the Equipment" on page 8.

Location and related information

- Country map indicating the project/program site



- Address of the project/program site together with the access time from the capital or major city, socioeconomic data on administrative region (sate /province /prefecture) or city where site is located.

NIX JAKARTA (Shown on the above map)

Address:

Access Time:

Population:

BPBD (Shown on the above map)

Address:

Access Time:

Population:

-Landowner (private estate or public estate) and the right to use the land for the project

No land acquisition is needed for the project

-Situation of the land (land inclination, drainage, electric power, water supply, telephone lines, etc.)

No difficulty is expected, since the infrastructures of the sites are fixed.

-Natural conditions

No difficult natural conditions are existed. The system will be installed inside the data center of NIX.

(3) Outline of the facility

Not applicable.

(4) Outline of the equipment

1) General

This equipment consists of a ***Center System deployed*** in Jakarta, an ***Area Control System*** deployed in Padang, ***Operation Terminals*** deployed in BNPB and BPBD, and ***Transmitter/Disaster Information Receiving Units*** deployed in related governmental organization/media locations.

2) Center System and Area Control System

Center System and the area control system are located in the datacenters and play central roles in continuous operations from information collection to distribution.

These systems are duplicated in each datacenter. If the facilities of each datacenter such as electric power supply, communication networks and so on are operated with a service level of 24/7 with no stops, the equipment will be configured so that it enables the same service level.

Moreover, each system deployed in each base location is designed so that it can continue operation independently even if the center system or the area control system becomes unable to operate due to a disaster and so on. The data stored in both the center system and the area control system are always duplicated with each other. During normal operation of communication networks, the center system and the area control system work together in a distributed manner. However, the each system works individually in case of disconnect of the communication networks.

3) Operation Terminal

Operation Terminals are deployed in BNPB and BPBD and display disaster information edited and/or processed by the center system or the area control system. The terminals are used to finally confirm a decision on delivering disaster information to various media. Basically representatives of BNPB and BPBD instruct operators to distribute disaster information although some types or contents of disaster information are possibly delivered automatically.

4) Transmitter/Disaster Information Receiving Unit

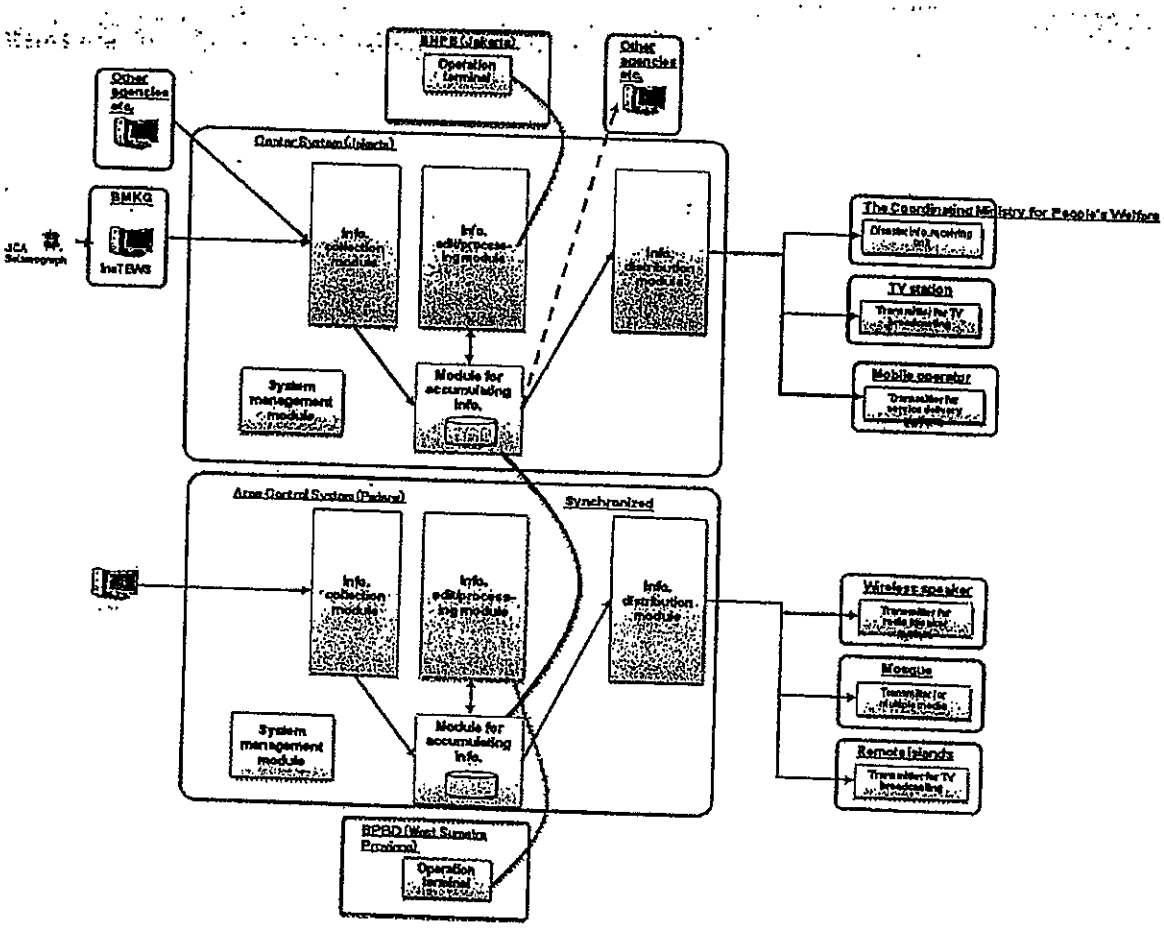
Transmitters are deployed in media stations. Transmitters relay disaster information from the center system and/or the area control system to the systems with suitable transformation for media stations.

Disaster Information Receiving Unit is the equipment to get the information by operator after relayed at Transmitter.

According to the type of media, the following transmitters are deployed selectively:

	Equipments	Units	Location
a	Disaster Information Receiving Unit	1 Units	Governmental Organization (The coordinating ministry for people's welfare)
B	Transmitter for Radio Speaker System	1Units	Wireless Radio Speaker System (Padang)
C	Transmitter for TV Broadcasting	1 Units	TV Station TVRI(Jakarta) (TBC)
D	Transmitter for Multiple Media	1 Units	Mosque
E	Transmitter for Radio Speaker System (Rural area/Remote Islands)	1 Units	Remote Islands
F	Transmitter for Service Delivery Platform	1 Units	Mobile Operator Telkomsel(Jakarta) (TBC)

The overall system configuration is shown below:



(5) Outline of the soft components

- Contents of the activities
  -Establishment of disaster management Plan
  (To prepare actual operation Plan to cope with disaster)
  And Conduct the small Drills
- Estimated cost
  -11.8mill Yen
- Human Resources (please select from the requesting country, Japan, or other countries)
  -Japan

(6) Items for which the costs are borne by the requesting country (items and the budget)

Cost for counterpart works of KOMINFO, BNPB, BPBD and BMKG
Operation and maintenance costs of the provided equipment

(7) Benefits/beneficiaries and the expected results of the project/program (qualitative or quantitative descriptions such as the population and areas that will benefit from the project)

Based on these problems, the proposed equipments are harmonized with Indonesia Government's Master Plan and developed for contribution to drastic reduction of loss in people.
Also many remote islands which are isolated from TV and radio broadcasting exist in Indonesia. The equipments should achieve quick distribution of disaster information by using community one seg etc. to these islands together with resolution of digital-divide problems in ordinary times.

We would like to set up quantitative evaluation scale as follows:

1) The throughput between input of information and distribution of information
   Less than 30 seconds of throughput from information input to the equipment to information output from the equipment shall be targeted in case of automatic processing mode without human operation. However, in case of remote islands, less than 3 minutes of throughput shall be targeted because it takes time to start up the system due to electric power saving and long transmit delay occurs in case of using satellite communication channels.
2) Potential disaster information coverage rate of population
   Potential disaster information coverage rate of population shall be targeted as a quantitative evaluation scale and the target value shall be more than 95%. This equipment consists of a center system, an area control system and relay equipments. Relay equipments are supposed to be deployed continuously to various media after completion of the proposed project.
   We would like to define "potential disaster information coverage rate of population" as ratio of total population of areas where inhabitants can use services after completion of installation of all relay equipments against all population in

Indonesia. Although inhabitants may be able to get disaster information from multiple media, we do not sum up number of reachable media on this purpose. 95% of potential disaster information coverage rate of population shall be targeted.

8. **Operation and maintenance of the facilities/equipment including the assignment of staff and the budget allocations after the completion of the project/program**

This proposing system is basically automatically processed system including collection, editing and dissemination).
Therefore the additional manpower to operation is not necessary in particular.
And also, the additional manpower to maintain is not necessary in particular, the reasons are summarized bellow;
-KOMINFO has already maintain many IT system so far
-There are some disaster management system in Padang already and BNPB and BPBD in Padang has operators experienced with using some disaster management system.
-Collection of disaster information is from existing system and equipment relative to dissemination will be installed at and with existing facilities and existing system.

Although, the communication fee, such as using satellite to communicate with rural and remote island, may increase, the increasing amount is not considered to be so big rather than existing.

9. **Implementing agency**

(1) Name of the implementing agency

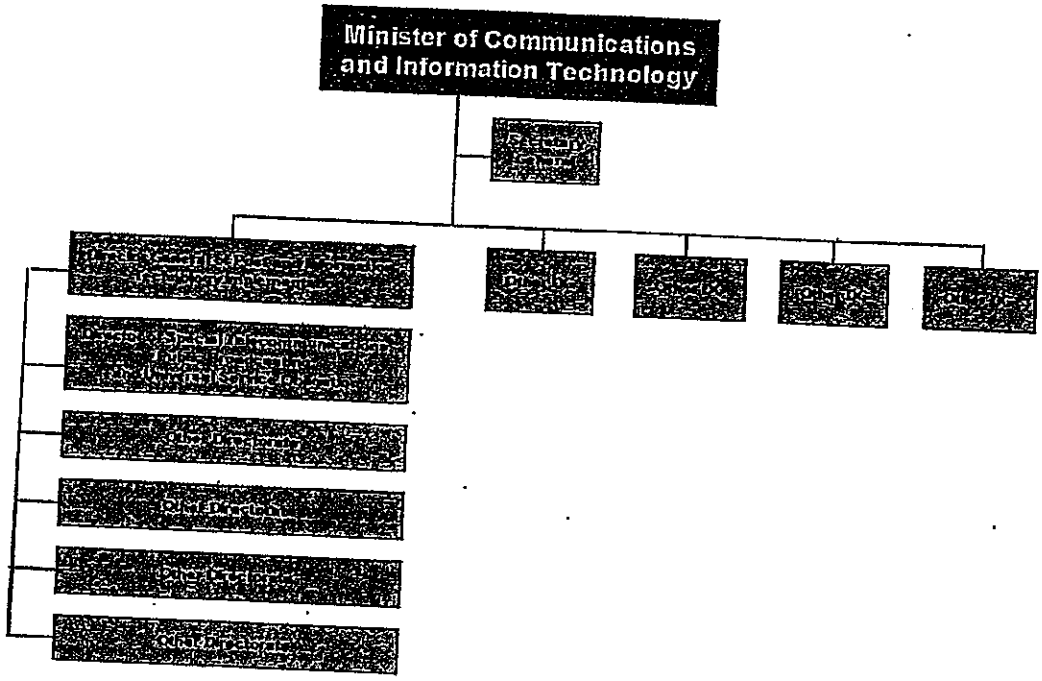
Directorate General of the Posts and Information Implementation, Ministry of Communications and Information Technology

(2) Number of personnel working for the organization

366 personels

(3) Organization Chart

ORGANIZATIONAL STRUCTURE



(4) Amount of budget for last three (3) years

(5) Contents of the activities of the organization that relate to the request

10. Tax exemption

(1) Names of the taxes to be exempted (customs duties, internal taxes, etc.)
Custom Duty and Corporate Income Tax

(2) If tax exemption is not applicable, specify and alternative methods
Tax exemption is applicable.

11. Relationship to other assistance schemes of Japan's ODA

(1) Development study (Name of the study, year of implementation, relationship to the request)
The Study on Natural Disaster Management in Indonesia was conducted with National Disaster Management Agency (BNPB) from March 2007 to March 2009. According to the study, following plan was proposed related to this request;

-Implementation of Production and Dissemination Tools of Disaster Management Information to General Public
-Data Digitization Development for Disaster Management Information
-Nation Wide Communication Network Development for Sharing Disaster Information

(2) Technical cooperation (Name of the project, type (project, experts, training, etc.), year of implementation, relationship to the request, input from the Japanese side)
Non related to proposing project

(3) Yen loan (Name of the project, year of implementation, relationship to the request)
Non related to proposing project

(4) Grant aid other than the request (Name of the project, year of implementation, relationship to the request)
The project for improvement of monitoring capacity for earthquake and tsunami early warning system has been going on with BMKG started from 2012. The major monitoring equipments to be improved are follows;
-Strong-motion seismograph
-Broadband seismograph
The monitoring information improved by above project can be utilized in this requesting project.

(5) Assistance from multilateral agencies (Name of the project, year of implementation, relationship to the request)
Not related to proposing project

(6) Assistance from NGOs (Name of the project, year of implementation, relationship to the request)
Not related to proposing project

12. Lessons learnt from past similar projects using Japanese grant aid

(1) Name of the past similar project
No past similar project using Japanese grant aid

(2) Results of the related evaluation
No past similar project using Japanese grant aid

(3) Followup situation
No past similar project using Japanese grant aid

(4) Lessons learnt and feedback in relation to this request

(5) No past similar project using Japanese grant aid

13. Study year expected, Implementation year expected

Design(Consultant) YEAR:2014, Implementation year : 2015/2016

14. Relevant information on the project from the gender perspective

(1) Please select one from the items below.

- The project does not need to consider gender related inputs/activities.

(2) Please explain how the project relates to gender issues.

15. Activities of other donor agencies in this sector

Please write the name of the donor agency, the year of implementation, type of assistance, and the contents of the assistance, if this is available.
-Indonesia Tsunami Early Warning System (InaTEWS) was developed and has been improved by Indonesia Government and donor countries such as Germany, China, etc.
-ASEAN Coordination Centre for Humanitarian Assistance on Disaster Management (AHA Centre) was built in 2007 by support of UNDP and another donors for the purpose of facilitating co-operation and coordination among the Parties, and with relevant United Nations and international organizations.

16. Environmental and social considerations

Consideration is not necessary for this project.

(END)

Appendix 4-2

Minutes of Discussion on September 2015

MINUTES OF DISCUSSIONS
ON
THE SECOND MISSION OF THE PREPARATORY SURVEY
FOR
THE PROJECT FOR STRENGTHENING DISASTER MANAGEMENT INFORMATION SYSTEM
IN THE REPUBLIC OF INDONESIA

In response to the request from Ministry of Communication and Information Technology (hereinafter referred as "KOMINFO"), the Government of Republic of Indonesia (hereinafter referred to as "the GOI") and, the Government of Japan decided to conduct a Preparatory Survey for the Project for Strengthening Disaster Management Information System (hereinafter referred to as "the Project"), and entrusted the Preparatory Survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the first Preparatory Survey Team for the Outline Design and signed the Minutes of Discussions (hereinafter referred as "the previous M/D") on November 24, 2014. Based on the previous M/D, JICA sent the second Preparatory Survey Team (hereinafter referred to as "the Team") for additional study to the Republic of Indonesia headed by Mr. Norihito YONEBAYASHI, Director of Disaster Risk Reduction Team 2, Global Environment Department, JICA and is scheduled to stay in the country from August 9 to September 4, 2015.

The Team held a series of discussions with the officials concerned of the GOI and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

This M/D is not legally binding although it is necessary for the official procedure of the Project.

Jakarta, September , 2015

Mr. Norihito YONEBAYASHI
Leader
Preparatory Survey Team
Japan International Cooperation Agency
JICA

Dr. Ir. Ismail MT
Deputy Director General for Special
Telecommunication, Public Broadcasting
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Ministry of Communication
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Dr. Sutopo Purwo Nugroho
Head of Data, Information &
Public Relation Center
National Disaster Management Authority,
BNPB

Mr. Mochammad Riyadi
Director for Earthquake & Tsunami Center
Meteorological Climatological and Geophysical
Agency, BMKG

ATTACHMENT

1. Objective of the Project

   The objective of the Project is to reduce transmission time and congestion on dissemination of the disaster information to related organizations by establishing disaster management information system, thereby contributing towards the disaster risk reduction from the Earthquake and Tsunami disaster.

2. Title of the Project

   Both sides confirmed to change the title of the Project as "the Project for Strengthening Disaster Management Information System" based on the contents and purpose of the Project.

3. Project Site

   Both sides confirmed that the tentative sites of the Project are in Jakarta, and other location for the servers will be examined and determined by further study.

4. Line Agency and Executing Agency

   Both sides confirmed that both the line agency and executing agency is Ministry of Communication and Information Technology (hereinafter referred to as "KOMINFO").

   The agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the undertakings are taken by relevant agencies properly and on time.

5. Relevant Agency

   5-1. National Disaster Management Authority (hereinafter referred as "BNPB") is responsible for utilization of disaster information provided by the Project properly and timely for the disaster risk reduction based on the Disaster Management Law (No.24 of 2007).

   5-2. Meteorological Climatological and Geophysical Agency (hereinafter referred as "BMKG") will provide disaster information for the Project through "Indonesia Tsunami Early Warning System" (hereinafter referred as "InaTEWS") to KOMINFO based on the Mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Cooperation Agreement (No.826 / KOMINFO / DJPPI / HK.03/05/205 and KS.301 / 011 / SU / V2015).

6. Items and issues requested by the Government of Republic of Indonesia

6-1. As a result of discussions, both sides confirmed that the items requested by the KOMINFO are as follows:

1) Main server
2) Back-up server
3) Regional server
4) Information Transmission system (software development)
5) Control system.

- Both sides agreed the criteria of location for the servers as Annex 1. (Criteria on the facilities for the equipment) from the viewpoint of maintenance and resilience. On this basis JICA will evaluate and finalize the location and number of the servers.
- KOMINFO requested to the Team technical assistance on XXXX. The Team agreed to study its necessity and if it is confirmed, the implementation of the technical assistance as soft component program would be considered in the Project.
- KOMINFO requested the Source Code of the software to the Team for customize and upgrading of the system. The Team took note the request and will examine it with related laws from the viewpoint of intellectual property right etc .

6-2. JICA will assess the appropriateness of the above requested items through the survey and will report findings to the Government of Japan. The final components of the Project would be decided by the Government of Japan.

7. Japanese Grant Aid Scheme

7-1. The relevant organizations of GOI understand the Japanese Grant Aid Scheme and its procedures as described in Annex 2-1(Japanese Grant), Annex 3(Flow Chart) and Annex 4 (Financial flow), and necessary measures to be taken by the GOI.

7-2. The GOI will take the necessary measures, as described in Annex 5 (Major Undertakings), for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented. The detailed contents of the Annex 5 and additional contents will be clarified by further study. Draft final of Annex 5 shall be explained and agreed no later than by the study team for Explanation of the Draft Preparatory Survey Report.

The contents of Annex 5 will be used to determine the following:

(1) The scope of the Project.
(2) The timing of the Project implementation.
(3) Timing and possibility of budget allocation.

Contents of Annex 5 will be updated as the Preparatory Survey progresses, and will finally be the Attachment to the Grant Agreement.

7-3. Both sides agreed the concept of Deficit and Warranty period for the Project will be one (1) year after handing over the Project. The warranty will cover troubles for the hardware and the deficit will cover software which will be installed for the system, and its privilege will be invalid by any customize and changes for the software.

8. Schedule of the Survey

8-1. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Republic of Indonesia in order to explain its contents around December, 2015.

8-2. If the contents of the draft Preparatory Survey Report is accepted in principle and the Undertakings are fully agreed by the GOI, JICA will complete the final report in English and send it to the GOI around February, 2016.

8-3. The Project will be examined by the Japanese Cabinet around between March and April, 2016.

8-4. The Exchange of Notes (E/N) and Grant Agreement (G/A) will be agreed and signed between GOI and Japan after approval of the Japanese Cabinet.

8-5. Preparation of the tender and relevant documents, which is followed by the Detailed Design, will be started around June, 2016

8-6. The above schedule is tentative and subject to change.

9. Environmental and Social Considerations

9-1. KOMINFO confirmed to give due environmental and social considerations during implementation of the Project, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010) which was handover by the Team.

9-2. The Project is categorized as "C" level according to JICA's Guideline because the Project is not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the Guidelines, and its potential adverse impacts on the environment are not likely to be significant.

10. Project Framework

10-1. Based on the results of the study, both sides confirmed that draft image of the Project is as shown in Annex 7 (System Structure). The disaster information and data from InaTEWS are the main input to the system operate by BMKG, through

the equipment provide by the Project and these information will be disseminated to relevant organizations and stakeholders. Since the concept of the Project is upgrading the dissemination flow mainly through mass media and telecommunication operators in order to increase the information coverage, so called "Last One Mile" of the dissemination of information is not included.

The outcomes of the Project are improving the dissemination of information in time, contents and coverage.

10-2. The target hazards are earthquake and tsunami.

10-3. The design is tentative and subject to change by further study.

11. Other Relevant Issues

11-1. Justification of the Project

- Both sides confirmed the Project is one of the components to expedite the ICT policy and program of GOI, and especially it is important to materialize the Disaster Management Information System Policy (hereinafter referred as "the DMIS").
- KOMINFO and BMKG signed the Mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Cooperation Agreement (No.826 / KOMINFO / DJPPI / HK.03/05/205 and KS.301 / 011 / SU / V2015) to initiate DMIS. These agreements ensure that information of InaTEWS will be provided to the Project.
- KOMINFO is planning to expand DMIS to other disaster information such as river flood, volcano eruption and forest fire, which will be disseminated through the Project. DMIS involves four (4) authorities, namely BMKG, Ministry of Public Works, Ministry of Forest, and Agency for Volcanology & Geological Hazard Mitigation.
- KOMINFO will prepare agreements between these agencies to conduct dissemination of disaster information next year for DMIS. These efforts will optimize the outcomes of the Project in the future and the people will receive great privilege from the Project, hence the Project should be core program of DMIS.
- KOMINFO prepares to issue the new Ministerial Decree in September 2015. It will give KOMINFO an authority of uniformity of disaster information contents for information providers, imposing the obligation of disaster information dissemination by telecommunication operators and the obligation of exercise for information dissemination twice a year by the operators to ensure the operation of the system programmed by the Project.
- KOMINFO and BNPB signed Memorandum of Understanding (No.10/BNPB/6/2012 and No.351 / M.KOMINFO /6/2021) which gives an authority to KOMINFO for disseminating disaster information.

- Focal Discussion Group (FDG) is the coordinating mechanism among 8 authorities for the Disaster Management Information System in Indonesia established in June, 2014. KOMINFO is leading and coordinating agency of FDG.

11-2. Measures to be taken by KOMINFO

- The Ministerial Decree should be put into practice before the visit of study team for Explanation of the Draft Preparatory Survey Report. It is directly related to secure the outcomes of the Project hence the design of the system.
- In addition to the exercise regulated by the Ministerial Decree, the periodical exercise for dissemination of disaster information with relevant stakeholders is essential in order to confirm the proper operation of the system in case of emergency since the frequency of occurrence of the target disaster is relatively low.
- Allocation of capable personnel and budget for operation and maintenance, which are important conditions for approval of the Project, should be arranged. The Team will clarify necessary measures, allocation of additional budget and qualified personnel required for the proper and effective utilization of facilities and equipment by further study.
- Accumulation of data with standard format is essential and utilized for the Disaster Risk Reduction and Management plan by the stakeholders.
- Location Based Service (LBS) or Cell Broadcast Service (CBS) should be implemented by the telecommunication operators with the authority of KOMINFO before the visit of study team for Explanation of the Draft Preparatory Survey Report to secure the coverage of the information.
- Securing the connection among the system, servers and InaTEWS with stable IP-VPN network for resilience and redundancy.
- The additional Agreement should be agreed with BNPB because the MoU (No.10/BNPB/6/2012 and No.351/M.KOMNIFO/6/2012), which was signed by KOMINFO and BNPB and also clarified the role of KOMINFO regarding the disaster information, become valid by the additional Agreement. One of the important justifications of the Project is that KOMINFO has official authority to disseminate disaster information. This should be done preferably before the visit of study team for Explanation of the Draft Preparatory Survey Report.
- The interface of the information would be designed with the consultation with BNPB, BMKG,and JICA.
- Technical support should be given to local Governmental organization who will utilize the system.

11-3. Measures to be taken by BNPB/BPBD

- Since the dissemination of disaster information to the community and people is supposed to be improved in transmission time, contents and coverage by the Project, it is important for the community and residence to act properly at the time of disaster. BNPB and BPBD play key roles to enhance and strengthen the capacity and disaster awareness for the people as well as to improve the response including evacuation, hence utilization of the outcomes of the Project by BNPB and BPBD is essential to optimize the outcomes.
- The system and software developed by the Project should be routine reference network as well as they should be connected with stable and resilient internet line such as IP-VPN.

  Hence introduction of the usage is essential with the cooperation of KOMINFO
- BNBP is an authority for the disaster risk reduction and guiding the local disaster authorities, BPBD is for making local disaster management plan including hazard mapping and evacuation plan. BNPB is prepareing "Technical Guideline of Regional Disaster Management for BPBD" and "Technical Guideline for Disaster Relief Exercise" through "the Project for Enhancement of the Disaster Management Capacity of National Disaster Management Authority (BNPB) and Regional Disaster Management Authority (BPBD) "with JICA. Utilization of these activities and outcomes by this Project would also enhance the profit of the Project.
- The additional Agreement should be agreed with KOMINFO because the MoU (No.10/BNPB/6/2012 and No.351/M.KOMNIFO/6/2012), which was signed by BNPB and KOMINFO and clarified the role of KOMINFO regarding the disaster information dissemination, become valid by the Agreement. One of the important justifications of the Project is that KOMINFO has official authority to disseminate disaster information.
- ICT communication network among BNPB, BPBD and Local Government should be upgraded. The reaching time and coverage of dissemination disaster information are supposed to be improved by the Project. It means that the prompt and proper judgment of evacuation by the authorities is expected by the community and people. Stable network among the authorities prevents the congestion and delay of information and operation for response.

11-4. Measures to be taken by BMKG

- BMKG will provide disaster information to KOMINFO based on the Mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Cooperation Agreement (No.826 / KOMINFO / DJPPI / HK.03/05/205 and KS.301/011/SU/V2015), which expire in 2020.Since the transmission of disaster information from InaTEWS to KOMINFO is the prerequisite condition of the

Project, extension of these agreements after expiration is essential for securing the outcomes of the Project.

- The interface of the information would be designed with the consultation with BMKG, KOMINFO and JICA.

11-5. Other Measures to be taken by relevant organizations

- The objective of the Project is not only to collect the information but to give useful, accurate and timely disaster information to the people in order to mitigate the disaster by using the equipment provided in the Project. The GOI should take all necessary measure to provide and disseminate the forecasting and warning information to the people in timely and accurate manner in close coordination with relevant agencies in order to get maximum benefit from the Project.
- There will be some duplication of information dissemination such as civil defense organizations and mass media. Duplication itself is important for the redundancy of the information until the system is acknowledged as stable and accurate, though it is important to avoid the confusion for those who received the information caused by the difference of the contents and reaching time. Relevant stakeholders should examine the situation after the system runs properly.
- Some of the relevant organizations receive assistance from JICA. To utilize the outcomes of the assistance will secure the maximum and mutual profit.

11-6. Regulation of Bank Indonesia (17/3/PBI/2015)

- Regarding the Regulation of Bank Indonesia (17/3/PBI/2015), which designate the Indonesian Rupees as a currency for the project invested by foreign organizations, the Japanese Grant Aid Project would be exempted from this regulation based on Article 4 (b).
- KOMINFO will consult to PBI in case the regulation gives negative impact to the Project.

ANNEX LIST

Annex 1

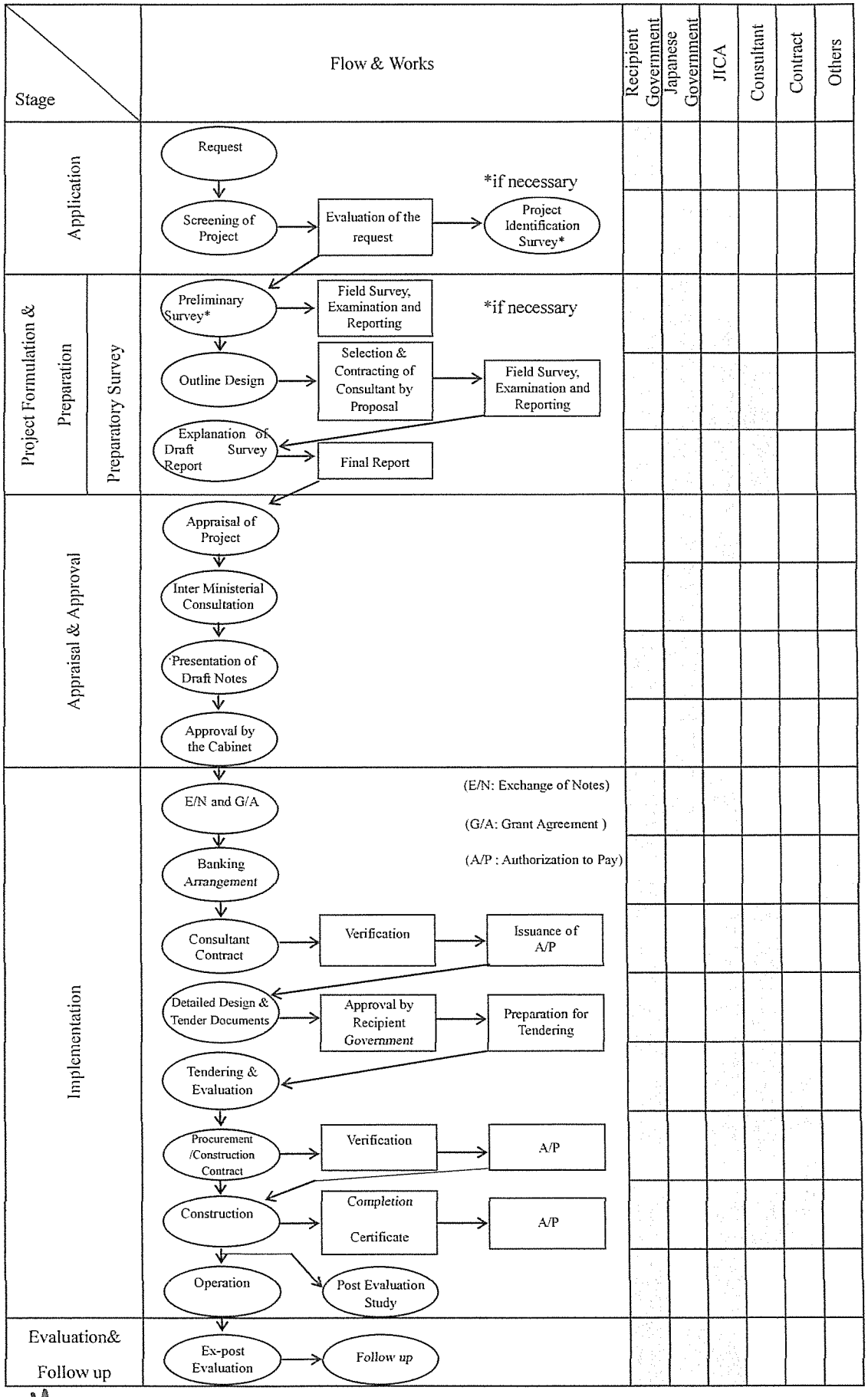
Criteria on the facility for the equipment installation

The facility for the equipment installation shall be:

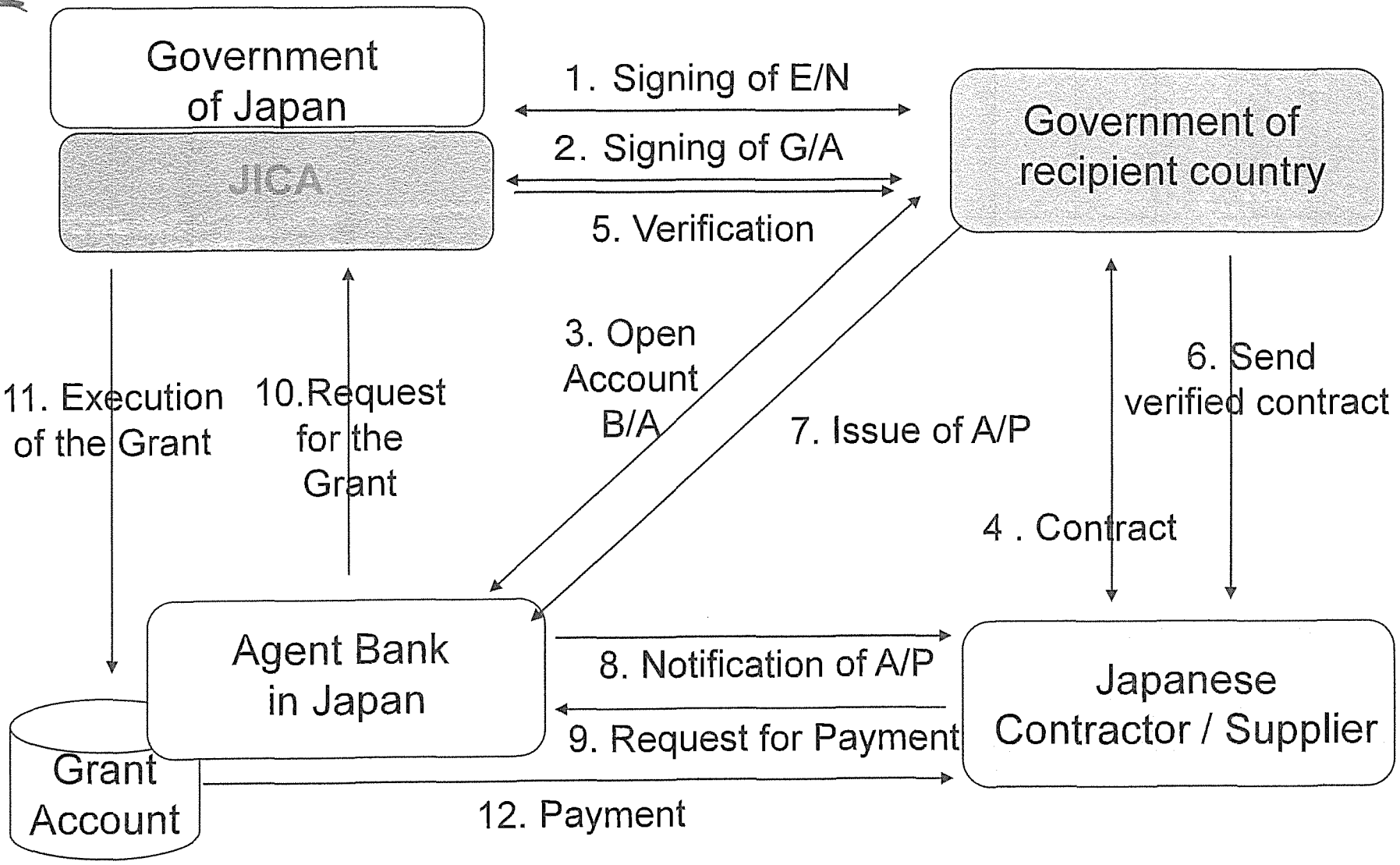
1. owned by KOMINFO or rented by KOMINFO with an indissoluble contract guaranteed.
2. not located in the Tsunami Hazard Area,
3. an earthquake-resistance-structure building,
4. connected to the fiber optic network in accordance with Palapa Ring policy,
5. securing the stable public electricity supply,
6. securing 24 hour monitoring-maintenance service,
7. securing a necessary space for racks to install servers,
8. supplying UPS and electric power generator(s) and secured continuous power supply even in emergency periods,
9. providing air-conditioning facilities including the backup,
10. providing automatic fire extinguishing system such as a gas type fire suppression,
11. providing both physical security and network system security thoroughly.

Annex 3

FLOW CHART OF JAPANESE GRANT PROCEDURES



Financial Flow of Grant Aid (A/P Type)



JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the "Grant") is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant is not supplied through the donation of materials as such.
Based on a JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the executing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal &Approval
  - -Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - -The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - -Agreement concluded between JICA and a recipient country
- Implementation
  - -Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant project. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japanese Grant Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles, in accordance with the E/N, to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals, in principle. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant.

(7) "Export and Re-export"

The products purchased under the Grant should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"), in principle. JICA will execute the Grant by making payments in Japanese yen, in principle, to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April, 2010).

(11) Monitoring

The Government of the recipient country must take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

(12) Safety Measures

The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organization Information

Authority (Signer of the G/A)	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Ministry	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:

1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1-3 Effectiveness and the indicators

- Effectiveness by the Project

Quantitative Effect (Operation and Effect indicators)		
Indicators	Original (Yr)	Target (Yr)
Qualitative Effect		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(M/D)* Attachment(s):Map	**Actual:** *(PMR)* Attachment(s):Map

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(M/D)	*(M/D)*	*(PMR)*
		Please state not only th e most updated schedul e but also other past re visions chronologically.

'Soft component' shall be included in 'Items'.		All change of design shal l be recorded regardless of its degree.

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule

2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
[M/D]	*(M/D)*		*(PMR)* As of (Date of Revision)
'Soft component' shall be stated in the column of 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Project Completion Date*			

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

2-3 *Undertakings by each Government*

2-3-1 Major Undertakings

See Attachment 2.

2-3-2 Activities

See Attachment 3.

2-3-3 Report on RD

See Attachment 4.

2-4 Project Cost

2-4-1 Project Cost

Table 2-3-1 Comparison of Original and Actual Cost by the Government of Japan

(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities (or Equipment)	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Consulting Services	- Detailed design -Procurement Management -Construction Supervision			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

Table 2-3-2 Comparison of Original and Actual Cost by the Government of XX

Items			*Cost* (Million USD)	
	Original	Actual	Original	Actual
	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = (local currency)

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

2-5 ***Organizations for Implementation***

2-5-1 **Executing Agency:**

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original: *(M/D)*
Actual, if changed: *(PMR)*

2-6 Environmental and Social Impacts

- The results of environmental monitoring as attached in Attachment XX in accordance with Schedule 4 of the Grant Agreement.
- The results of social monitoring as attached in Attachment XX in accordance with Schedule 4 of the Grant Agreement.
- Information on the disclosed results of environmental and social monitoring to local stakeholders, whenever applicable.

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: *(M/D)*
Actual: *(PMR)*

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: *(M/D)*

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on Project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form/Social Monitoring FormMonitoring sheet on price of specified materials (Quarterly)
6. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (Completion Report Only)

Annex 5

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	*To open Bank Account (Banking Arrangement (B/A))*	*within 1 month* after G/A	KOMINFO		
2	To confirm necessary procedure for exemption of Regulation of Bank Indonesia (17/3/PBI/2015)	before notice of the tender document	KOMINFO		
3	To secure the following place and relevant permission for installation 1) Site for Main Server 2) Site for Backup Server 3) Site for Regional Server	before notice of the tender document	KOMINFO		
4	To prepare the following items for the Project sites (1)Electricity, Electricity generator in case of emergency (2)Optical Fiber Network and Data Center (3)System Operator	before notice of the tender document	KOMINFO		
5	To issue the Ministerial Decree regarding the obligation and regulation of disaster information .	before draft explanation survey	KOMINFO		

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the singing of the contract	KOMINFO		
	2) Payment commission for A/P	every payment	KOMINFO		
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	KOMINFO		
	2) Internal transportation from the port of disembarkation to the project site	during the Project	KOMINFO		
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the *supply of the products and the services under the verified contract* such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	KOMINFO		
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted. Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	KOMINFO		
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project	KOMINFO		
6	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities				
	1) Electricity The distributing line to the site	before start of Installation	KOMINFO		
	2) Electricity Generator in case of emergency The distributing line to the site	before completion of Installation	KOMINFO		
	3) Ari-conditioning Unit		KOMINFO		
7	To ensures to obtain the information form InaTeWS of BMKG based on their mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Agreement (No.826/KOMINFO/DJPPI/HK.03/05/205 and KS.301/011/SU/V2015)	before completion of Installation	KOMINFO		
8	To make a Technical Agreement for MoU (NoMoU 10/BNPB/6/2012 and No.351/M.KOMINFO/6/2012) which was signed by KOMINFO and BNPB	before completion of Installation	KOMINFO / BNPB		
9	To improve disaster information dissemination flow from BNPB to BNPB	before completion of Installation	BNPB		
10	To provide working space for Japanese consultants	during the Project	KOMINFO		

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) *Operation and maintenance structure* 3) Routine check/Periodic inspection 4) Periodic exercise of dissemination 5) Allocation of suitable Counterpart	After completion of the installation	KOMINFO		
2	To ensures to obtain the information form InaTeWS of BMKG based on their mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Agreement (No.826/KOMINFO/DJPPI/HK.03/05/205 and KS.301/011/SU/V2015)	After completion of the installation	KOMINFO		
3	To extend the period of the MoU (No.399 year 2015 and No.KS301/010/KB/V/2015) and Agreement (No.826/KOMINFO/DJPPI/HK.03/05/205 and KS.301/011/SU/V2015) which was signed between KOMINFO and BMKG	before the invalidation (2020)	KOMINFO		
4	To extend the period of the MoU and Agreement which was signed by KOMINFO and BNPB 2012 about disaster information dissemination.	before the invalidation (2017)	KOMINFO /BNPB		
5	To enforce and monitor that the regulations of the Ministerial Decree is properly implemented by telecommunication providers		KOMINFO		
6	To enforce telecommunication providers to introduce LBS or CBS as their service to customers		KOMINFO		
7	To give technical support to BNPB and BPBD for operating the software developed by the Project		KOMINFO		
8	To sort out the duplicated communication line and flows of information		KOMINFO		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

Major Undertakings to be covered by the Japanese Grant

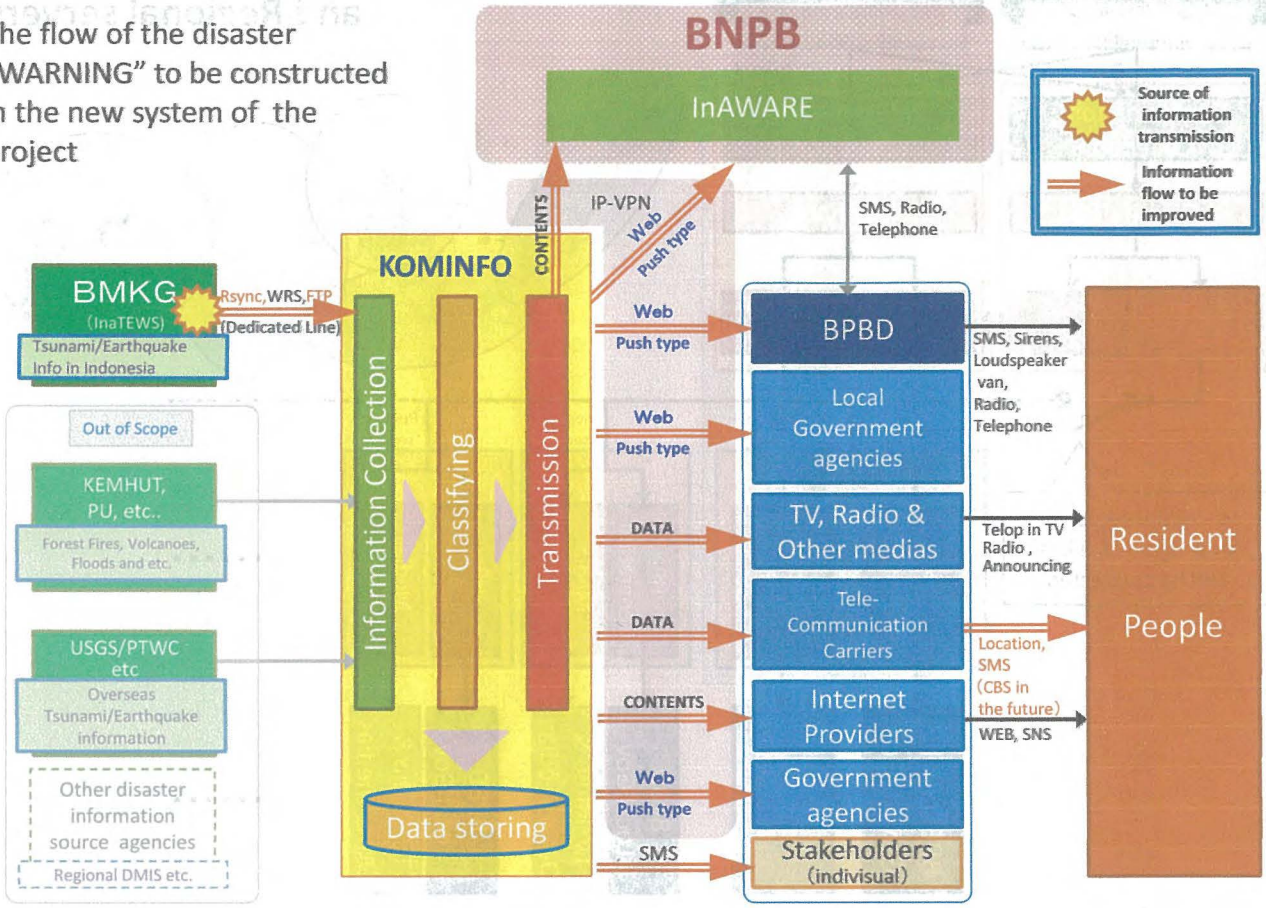
No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To provide equipment			
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine(Air) transportation of the products from Japan to the *recipient country*			
	b) Internal transportation from the port of disembarkation to the project site			
	2) To provide equipment with installation and commissioning			
	Main Server			
	Backup Server			
	Regional Server			
	Software			
2	To implement detailed design, tender support and construction supervision. (Consultant)			
3	Contingencies			
	Total			

*; The cost estimates are provisional. This is subject to the approval of the Government of Japan.

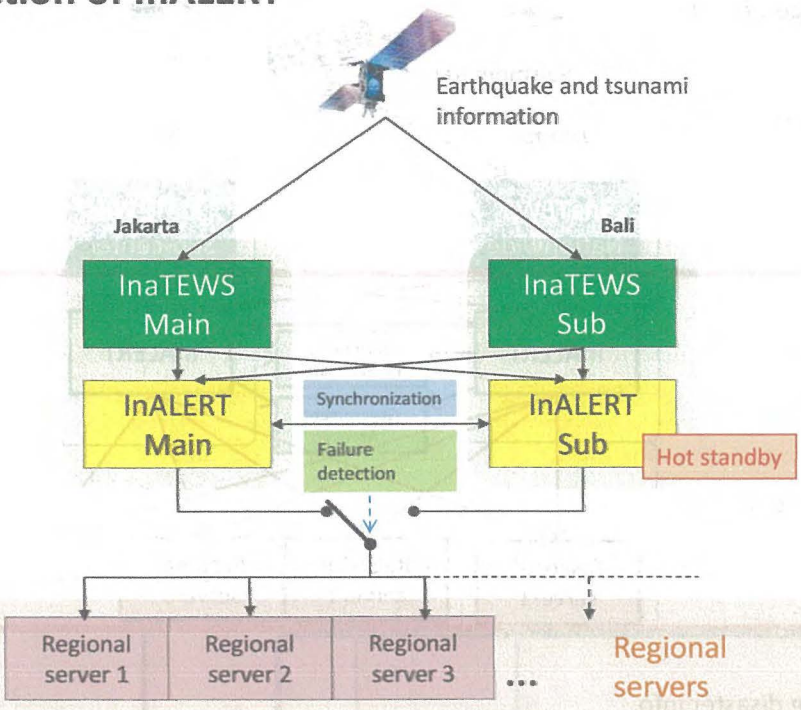
SYSTEM STRUCTURE (DRAFT)

Annex 6

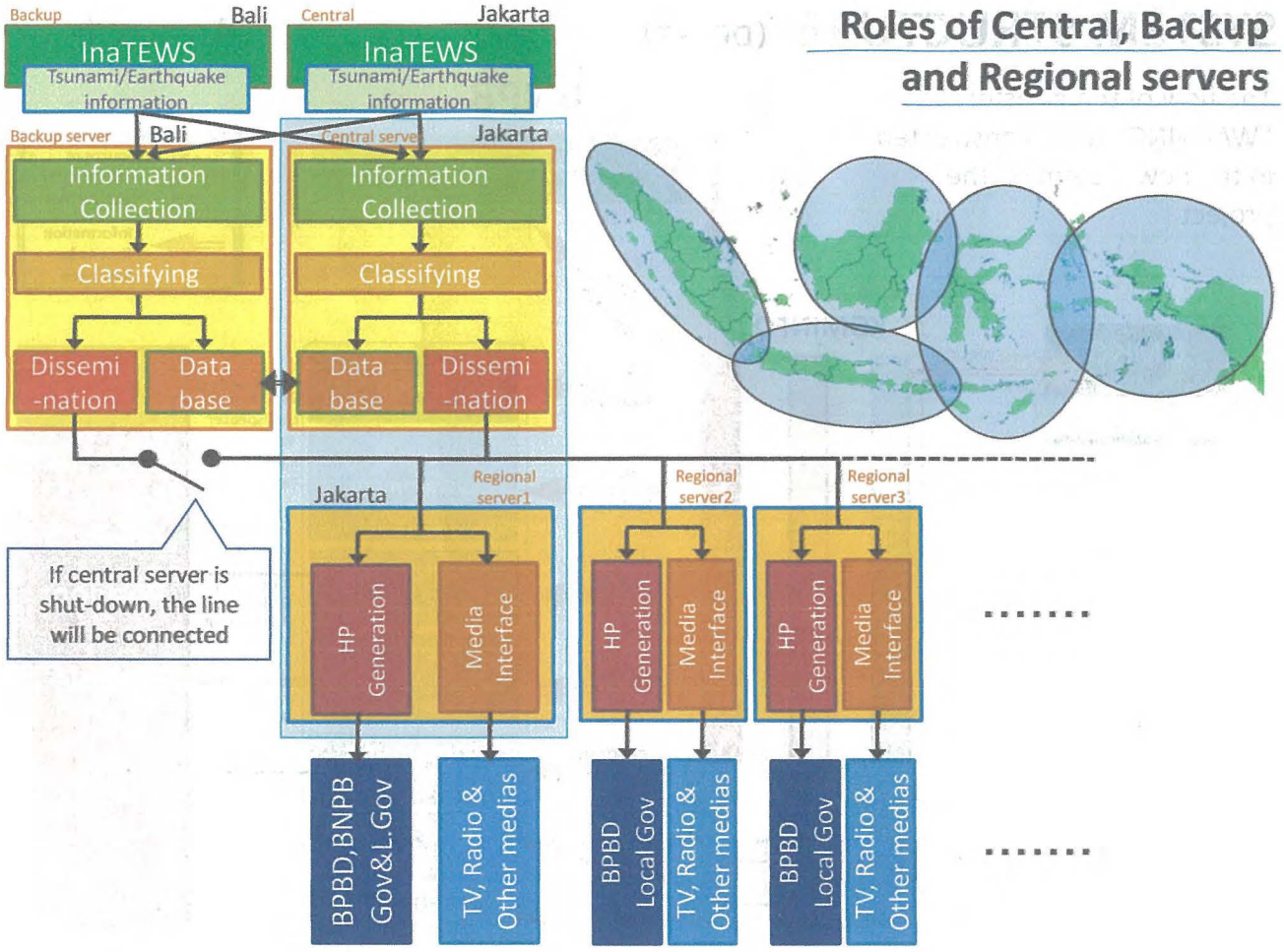
The flow of the disaster "WARNING" to be constructed in the new system of the project

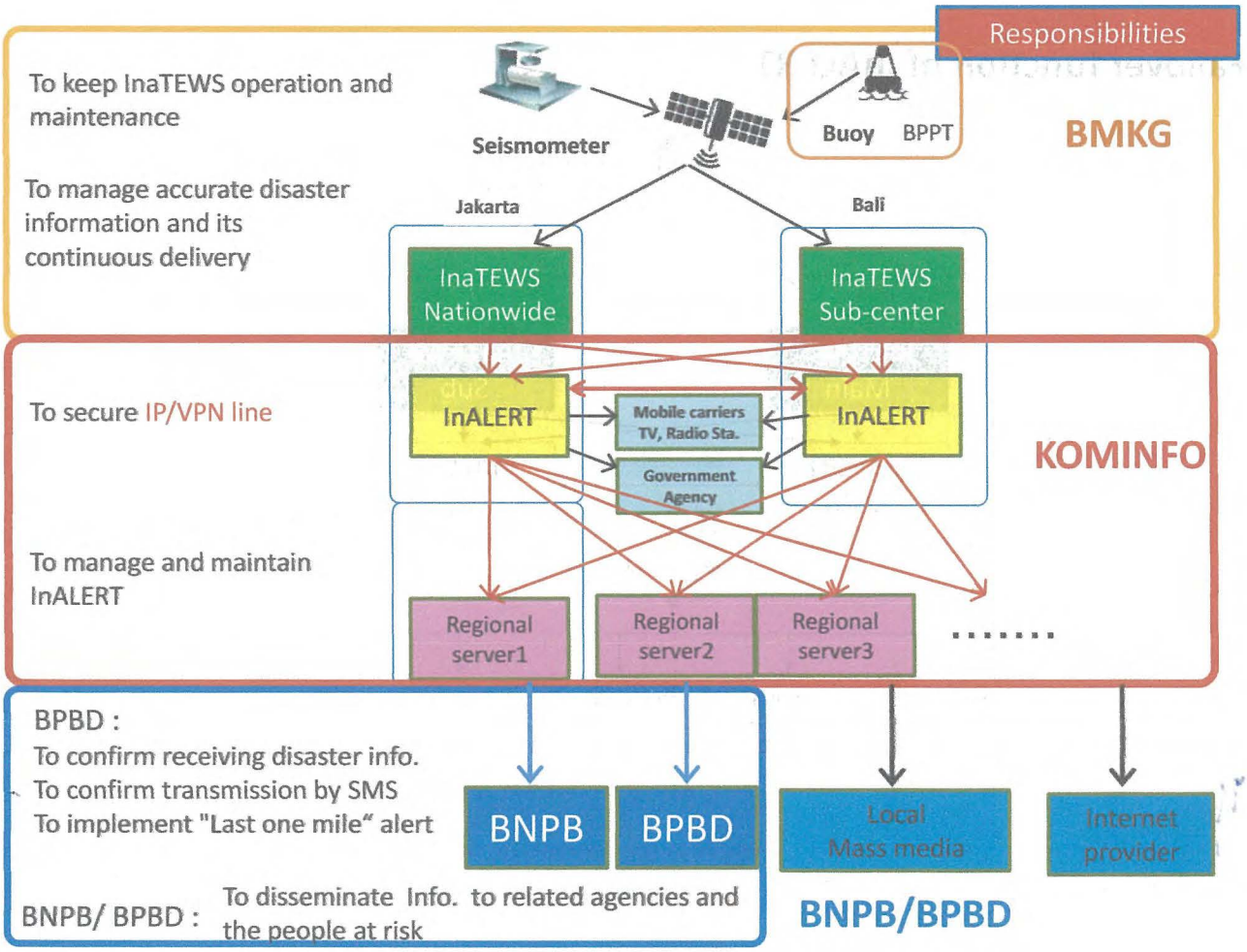


Failover function of InALERT



Roles of Central, Backup and Regional servers





Appendix 4-3

Minutes of Discussions on January 27, 2016

MINUTES OF DISCUSSIONS
ON
THE DRAFT REPORT EXPLANATION MISSION OF THE PREPARATORY SURVEY
FOR
THE PROJECT FOR STRENGTHENING DISASTER MANAGEMENT INFORMATION SYSTEM
IN THE REPUBLIC OF INDONESIA
(Explanation on Draft Preparatory Survey Report)

On the basis of the discussions with and field survey in the Government of Republic of Indonesia (hereinafter referred to as "the GOI") in November 2014 and September 2015, and subsequent technical examination of the results in Japan, Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a draft Preparatory Survey Report on the Project for Strengthening Disaster Management Information System (hereinafter referred to as "Project" and "Draft Report").

In order to explain the Draft Report and to consult with the concerned officials of the GOI on its contents, JICA sent to Indonesia the Preparatory Survey Team for the explanation of the Draft Report (hereinafter referred to as "the Team"), headed by Mr. EJIRI Yukihiko, Senior Assistant Director, Water Resource and Disaster Risk Reduction Group, Global Environment Department, JICA and is scheduled to stay in the country from January 24 to January 29, 2016.

As a result of the discussions, both sides confirmed the main items described in the attached sheets.

Jakarta, January 27, 2016

Mr. EJIRI Yukihiko
Leader
Preparatory Survey Team
Japan International Cooperation Agency
JICA

Dr. Ir. Ismail MT
Deputy Director General for Special
Telecommunication, Public Broadcasting
and Universal Services Obligation
Ministry of Communication
and Information Technology, KOMINFO

Dr. Sutopo Purwo Nugroho
Head of Data, Information &
Public Relation Center
National Disaster Management Authority,
BNPB

ATTACHMENT

1. Objective of the Project

   The objective of the Project is to reduce transmission time and congestion on dissemination of the disaster information to related organizations by establishing disaster management information system (hereinafter referred to as "the System"), thereby contributing towards the disaster risk reduction from the Earthquake and Tsunami disaster.

2. Title of the Preparatory Survey

   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Strengthening Disaster Management Information System".

3. Project Site

   Both sides confirmed that the sites of the Project are main site in Jakarta, and back up equipment in Bali which is shown in Annex 1. (Project Sites)

4. Line Agency and Executing Agency

   Both sides confirmed that both the line agency and executing agency is Ministry of Communication and Information Technology (hereinafter referred to as "KOMINFO").

   The agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the undertakings are taken by relevant agencies properly and on time.

5. Relevant Agency (as confirmed on previous MoD)

   5-1. National Disaster Management Authority (hereinafter referred as "BNPB") is responsible for utilization of disaster information provided by the Project properly and timely for the disaster risk reduction based on the Disaster Management Law (No.24 of 2007).

   5-2. Meteorological Climatological and Geophysical Agency (hereinafter referred as "BMKG") will provide disaster information for the Project through "Indonesia Tsunami Early Warning System" (hereinafter referred as "InaTEWS") to KOMINFO based on the Mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Cooperation Agreement (No.826 / KOMINFO / DJPPI / HK.03/05/205 and KS.301 / 011 / SU / V2015).

6. Contents of the Draft Report

After the explanation of the contents of the Draft Report by the Team, the GOI side agreed in principle to its contents.

7. Cost Estimation

Both sides confirmed that the Project cost estimation as attached in Annex 2(Project Cost Estimation) was provisional and would be examined further by the Government of Japan for its final approval.

8. Confidentiality of the Cost Estimation and Specifications

Both sides confirmed that the Project cost estimation and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until all the contracts of the Project are concluded.

9. Japanese Grant Aid Scheme

The relevant organizations of GOI understand the Japanese Grant Aid Scheme and its procedures as described in Annex 3-1(Japanese Grant), Annex 3-2(Flow Chart) and Annex 3-3 (Financial flow), and necessary measures to be taken by the GOI.

10. Project Implementation Schedule

The Team explained to the GOI side that the expected implementation schedule is as attached in Annex 4. (Project Schedule)

11. Expected outcomes and Indicators

Both sides agreed that the indicators for expected outcomes are as follows. The GOI side has responsibility to monitor the progress of the indicators and achieve the target in year 2021.

[Quantative Effect]

Quantitatively assessed impacts expected from the Project implementation is shown as bellow:

Table 1: Quantitatively evaluated impacts after the Project implementation

Index		Reference value(2015)	Target value (After completion 3 years, 2021)
Increasing of number of organizations to be delivered disaster management information		2,800 ● Disaster management related organizations: 300 ● Army and Police: 500 ● Mass media: 2,000	4,728 ● Disaster management related organizations: 534 ● Central government 37 ● Local government: 507 ● Army and police: 1,014 ● Mass media: 2,630 ● Telecommunication career: 6
Increasing of deliver information amount	Disaster management related organizations	869 MB/time	2,092 MB/time
	Total amount of information	1,961 MB/time	3,144 MB/time

Due to the implementation of the project, it could be achieved to transfer the earthquake and tsunami information by using a communication line where the bandwidth to transmit the information is secured. Regarding the impacts shown in the above, appearances of degrees of impacts could be observed in the system connection ledger managed by KOMINFO in which situations of the operation of the System are recorded.

[Qualitative Effect]

Qualitatively assessed impacts expected from the Project implementation are shown as bellow:

- To improve the speed to transmit the disaster information

  By the Project system, as the communication line in which the bandwidth to transmit information are secured, the congestion and delay of the information communication could be avoided during disaster incidents.
- To increase information volume to be transmitted

  By the Project system, information volume (information contents and quantities) to be transmitted at one time could be increased and it could be accordingly achieved that disaster management related organizations and government organizations were able to receive the earthquake and tsunami information.
- To achieve to confirm information reception
- By the Project system, it could be achieved to disaster management related organizations such as information volume (information contents and quantities) to be transmitted at one time could be increased and it could be accordingly achieved that disaster management related
- To establish the early warning disaster management system

By the system operation drill provided in the System, it could be available to make sure about the System operation available and to train operators to be skillful on the system operation.

As the result as the above, it has been determined that the Project implementation could be highly relevant and the high effectiveness of the implementation can be expected.

12. Technical assistance ("Soft Component" of the Project)
Considering the sustainable operation and maintenance of the provided facility, technical assistance is planned to be provided under the Project. The GOI side confirmed that it will assign necessary number of competent and appropriate C/Ps as described in the Draft Report.

13. Undertakings Taken by Both Sides
Both sides confirmed to undertakings described in Annex 5. The GOI side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage. Contents of Annex 5 will be updated as the Detailed Design progresses, and will finally be the Attachment to the Grant Agreement.

14. Monitoring during the Implementation
The Project will be monitored every six months by the executing agency and using the Project Monitoring Report (PMR) as shown in Annex 6.

15. Ex-Post Evaluation
JICA will conduct ex-post evaluation three (3) years after the Project completion with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability) of the Project. Result of the evaluation will be publicized. The GOI side is required to provide necessary support for them.

16. Schedule of the Study
JICA will complete the Final Report of the Preparatory Survey in accordance with the confirmed items and send it to the Indonesia side around March, 2016..

17. Environmental and Social Considerations

17-1. KOMINFO confirmed to give due environmental and social considerations during implementation of the Project, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010) which was handover by the Team.

17-2. The Project is categorized as "C" level according to JICA's Guideline because the Project is not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the Guidelines, and its potential adverse impacts on the environment are not likely to be significant.

18. Issues to be Considered for the Smooth Implementation of the Project

18-1. Both sides agreed the concept of Deficit and Warranty period for the Project will be one (1) year after handing over the Project. The warranty will cover troubles for the hardware and the deficit will cover software which will be installed for the system, and its privilege will be invalid by any customize and changes for the software.

18-2. The Team proposed necessity of establishment of the Disaster Management Information Law for enhance and ensure the role and responsibility of related organizations. Both sides agreed that when GOI will consider the Disaster Management Information Law, DMIS which will be installed by The Project should be core of the national system.

18-3. Both sides agreed the importance of cooperation between KOMINFO, BMKG and BNPB because of the Project Framework and information dissemination flow will be new duty for KOMINFO. KOMINFO will maintain Mutual Agreement and Cooperation Agreement between BMKG and BNPB.

18-4. The Team confirmed the expansion plan and renewal plan of the system. KOMINFO explained about the expansion plan that KOMINFO lead the Focal Discussion Group continuously and preparing mutual agreement with relevant organizations to expansion of connection to the System. The System Renewal is normally 5 years after installation and for this project also if necessary KOMINFO will allocate budget for it renewal.

18-5. The Team recommended for KOMINFO to make a contract with Japanese developer of the System for the maintenance because of its merit and advantage. KOMINFO understood its advantage but the tender for the contract should be under the procurement regulation.

19. Other Relevant Issues

19-1. Operation and Maintenance of the Equipment

The Team explained the importance of operation and maintenance of the equipment provided by the Project considering the proper asset management impacts greatly on life- span of the equipment and its maintenance cost. The GOI side shall secure enough staff and budgets necessary for appropriate operation and maintenance of the equipment. The annual operation and maintenance costs are estimated and shown in Annex 2.

19-2. Justification of the Project

- The Team and KOMINFO reaffirmed the Justification of the Project which described on "Minutes of Discussions" signed on November 24, 2015 (hereinafter referred to as "Previous MD").
- The Team confirmed the actual situation of the Ministerial Decree which obligate disaster information dissemination and to unify the data format for Mass media and Telecommunication Company. The Ministerial Decree was signed by Minister and it is on process to issue the public. KOMINFO ensured the issue of the Ministerial Decree before the signing of Exchange Note (E/N) and Grant Agreement (G/A).
- KOMINFO is already implementing Disaster Information Dissemination trial in cooperation with BMKG and 4 Telecommunication Companies based on Mutual Agreement and Ministerial Decree. The results of this trial will be informed to JICA for the improving of the Detailed Design for the Project.

19-3. Measures to be taken by KOMINFO

- The Team and KOMINFO reaffirmed the Measures to be taken by KOMINFO which described on "Previous MD".

19-4. Measures to be taken by BNPB/BPBD

- The Team and BNPB reaffirmed the Measures to be taken by KOMINFO which described on "Previous MD".

19-5. International Framework for Disaster Risk Reduction and World Tsunami Awareness Day

- Both Sides reaffirmed priorities for action of Sendai framework for Disaster Risk Reduction (hereinafter referred as "SFDRR"). The Project will contribute to implementation of SFDRR.
- Also confirmed the adoption of resolution the World Tsunami Awareness Day in the United Nations which resolution was proposed by GOI and Japan. Based on this resolution adaptation both sides confirmed the importance of improvement of the awareness of the people and utilization of The Project for this purpose.

19-6. Regulation of Bank Indonesia (17/3/PBI/2015)

- Regarding the Regulation of Bank Indonesia (17/3/PBI/2015), which designate the Indonesian Rupees as a currency for the project invested by foreign organizations, the Japanese Grant Aid Project would be exempted from this regulation based on Article 4 (b).
- KOMINFO will consult to PBI in case the regulation gives negative impact to the Project.

19-7. Disclosure of Information

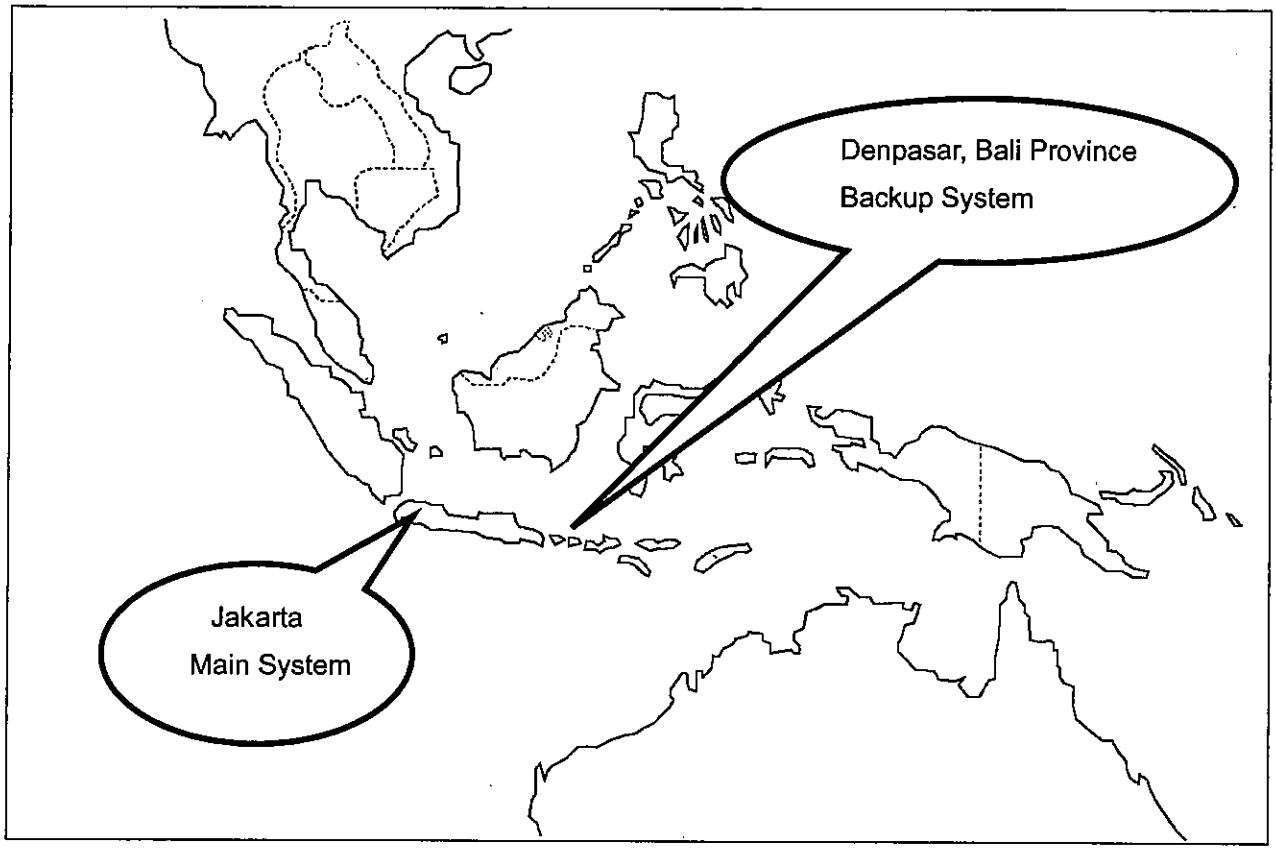
Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after completion of the Preparatory Survey. All the study results including the Project cost will be disclosed to the public after all the contracts for the Project are concluded.

ANNEX LIST

Annex	1	:	Project Site
Annex	2	:	Project Cost Estimation
Annex	3-1	:	Japanese Grant
Annex	3-2	:	Flow Chart of Japanese Grant Procedures
Annex	3-3	:	Financial Flow of Japanese Gran
Annex	4	:	Project Implementation Schedule
Annex	5	:	Major Undertakings to be taken by Each Government
Annex	6	:	Project Monitoring Report (template)
Annex	7	:	Mutual Agreement (No.399 year 2015, No.KS301/010/KB/V/2015)

Annex 1

Project Site



[The Project for Strengthening Disaster Management Information System]

*This page is closed due to the confidentially.

Annex2

Project Cost Estimation

Project Components by Japan Grant Aid

Total Project Cost borne by Japan Grant Aid : Approximately [redacted] Million JPY

Equipment ([redacted] Million JPY)

Detailed Design and Supervision ([redacted] Million JPY)

Soft Component ([redacted] Million JPY)

Project Components by the Indonesia Government

Total Project Cost born by Indonesia Government: Approximately

Contents	Cost (Million IDR)
Commission for Banking Arrangement (B/A)	114
Cost for line opening	18
Cost for soft component	45
Total	177

Estimated Operation and Maintenance Cost born by the Indonesia Government

Estimated annual O&M cost

Contents	Cost (Million IDR)
Rent fee for Cyber Building and NIX	1,056
Usage fee for network	22
Electricity usage fee	384
Usage fee for IP-VPN	126
Personnel expenses for observers	1,080
Total	2,668

JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the "Grant") is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant is not supplied through the donation of materials as such.

Based on a JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the executing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal &Approval
  - -Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - -The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - -Agreement concluded between JICA and a recipient country
- Implementation
  - -Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant project. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japanese Grant Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles, in accordance with the E/N, to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals, in principle. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant.

(7) "Export and Re-export"

The products purchased under the Grant should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"), in principle. JICA will execute the Grant by making payments in Japanese yen, in principle, to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April, 2010) .

(11) Monitoring

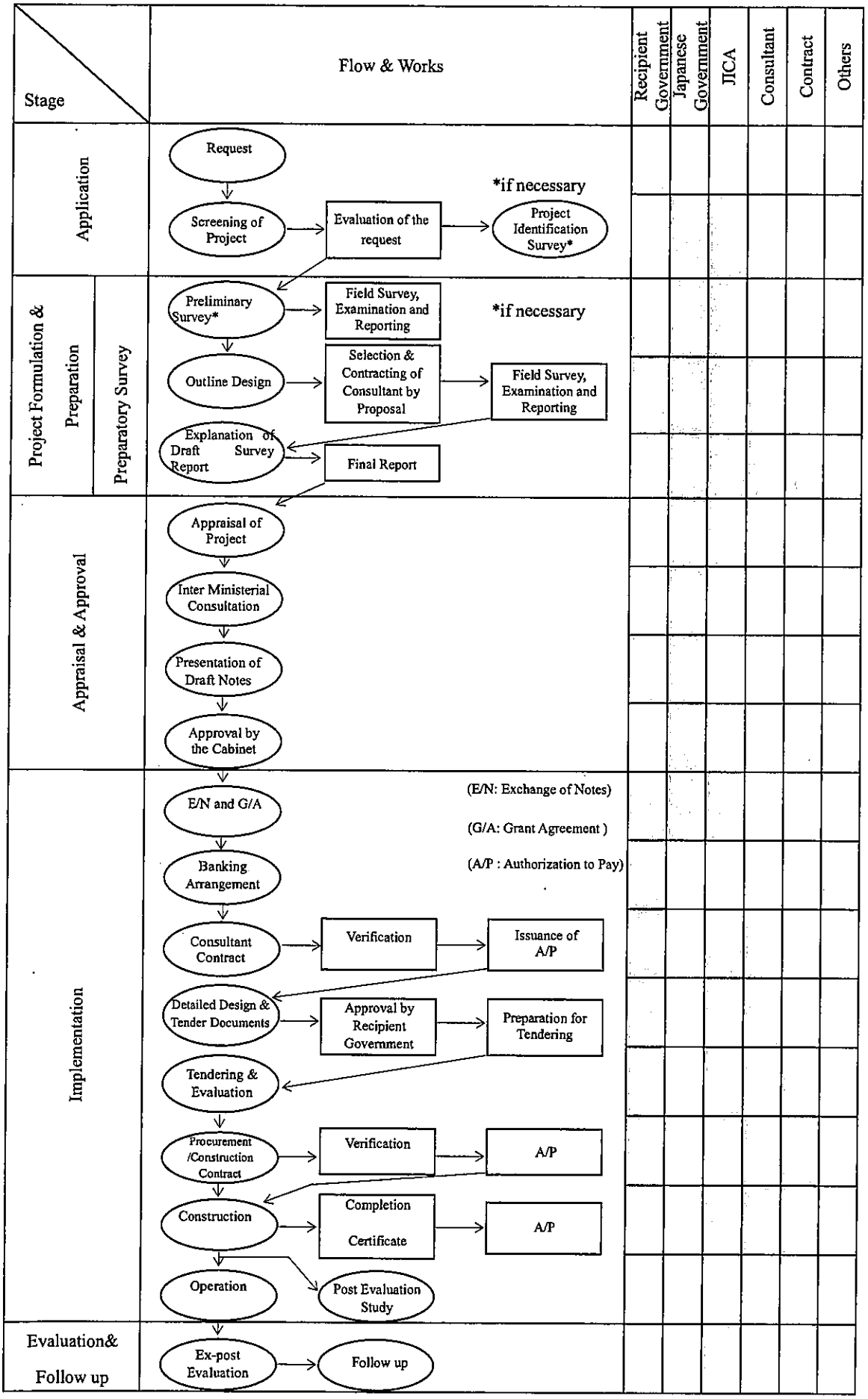
The Government of the recipient country must take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

(12) Safety Measures

The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

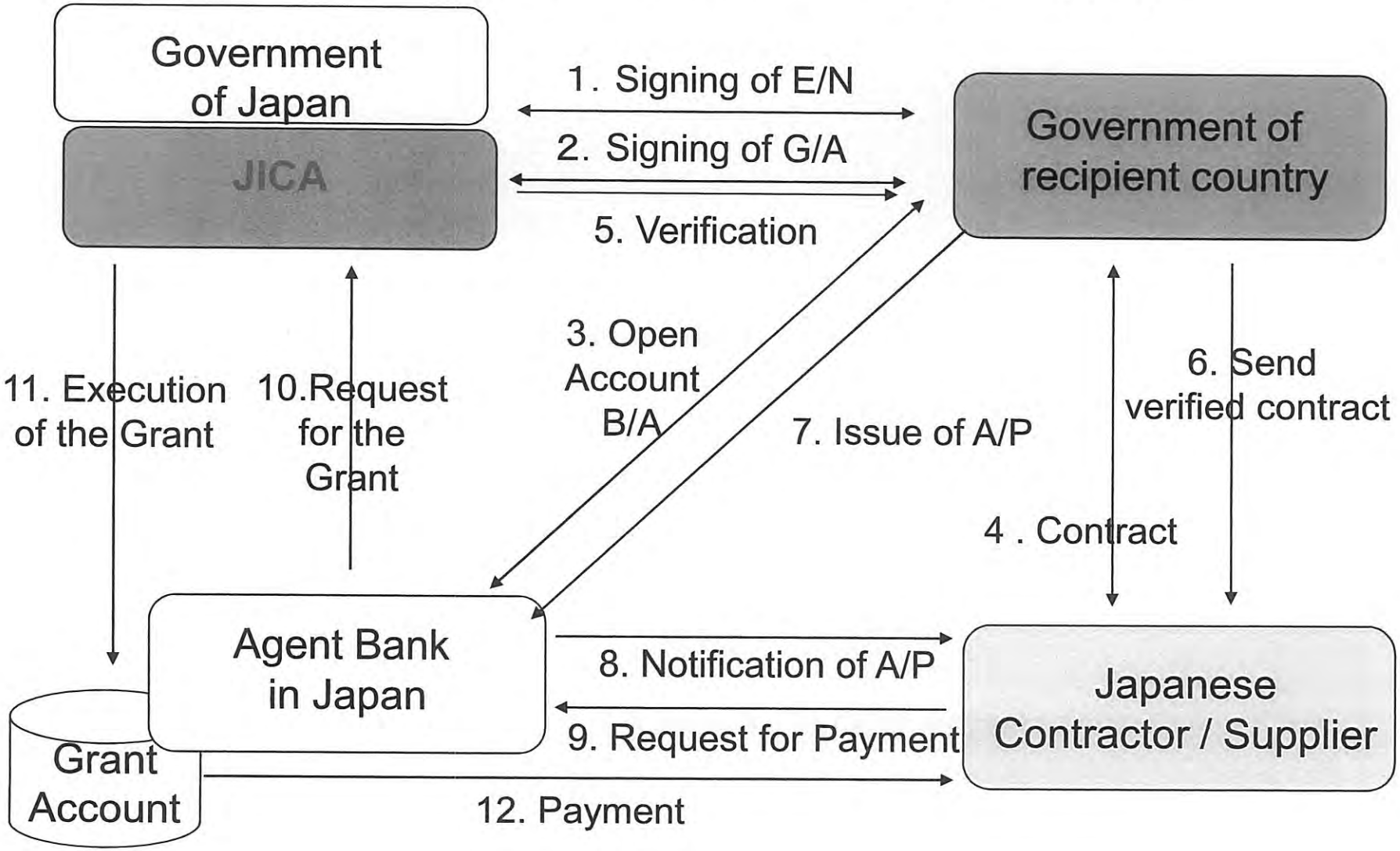
Annex 3-2

FLOW CHART OF JAPANESE GRANT PROCEDURES



Annex 3-3

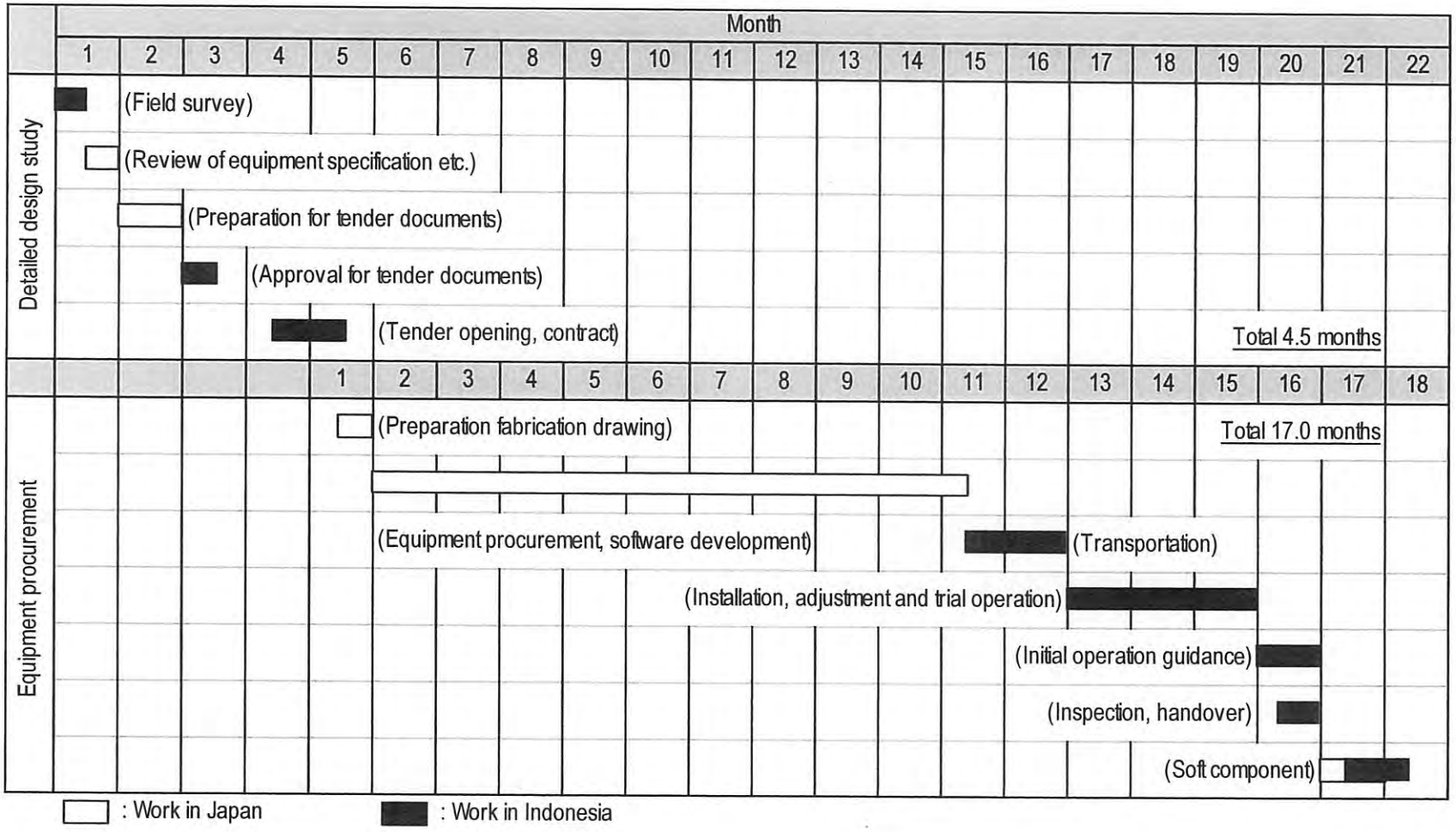
Financial Flow of Grant Aid (A/P Type)



Annex 4

Project Implementation Schedule

Implementation schedule in the Project is as follows:



Annex 5

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO.	Items	Deadline	In charge	Cost	Ref.
1	To issue the Ministerial Decree regarding the obligation and regulation of disaster information.	before the sing of G/A	KOMINFO		
2	To confirm necessary procedure for implementation of the Grant Aid Project with relevant agencies.	before the sing of G/A	KOMINFO		
3	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	KOMINFO		
4	To confirm necessary procedure for exemption of Regulation of Bank Indonesia (17/3/PBI/2015)	before notice of the tender document	KOMINFO		
5	To secure the following place and relevant permission for installation 1) Site for Main Server 2) Site for Backup Server 3) Site for Regional Server	before notice of the tender document	KOMINFO		
6	To prepare the following items for the Project sites (1)Electricity, Electricity generator in case of emergency (2)Optical Fiber Network and Data Center (3)System Operator	before notice of the tender document	KOMINFO		

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost (Million IDR)	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the singing of the contract	KOMINFO	114	
	2) Payment commission for A/P	every payment	KOMINFO		
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	KOMINFO		
	2) Internal transportation from the port of disembarkation to the project site	during the Project	KOMINFO		
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	KOMINFO		
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted. Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	KOMINFO		
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project	KOMINFO		
6	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities				
	1) Electricity The distributing line to the site	before start of Installation	KOMINFO		
	2) Electricity Generator in case of emergency The distributing line to the site	before completion of Installation	KOMINFO		

	3) Ari-conditioning Unit		KOMINFO		
7	To ensure the connection with IP-VPN to the System	before completion of Installation	KOMINFO		
8	To ensures to obtain the information form InaTeWS of BMKG based on their mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Agreement (No.826/KOMINFO/DJPPI/HK.03/05/205 and KS.301/011/SU/V2015)	before completion of Installation	KOMINFO		
9	To make a Technical Agreement for MoU (NoMoU 10/BNPB/6/2012 and No.351/M.KOMINFO/6/2012) which was signed by KOMINFO and BNPB	before completion of Installation	KOMINFO / BNPB		
10	To improve disaster information dissemination flow from BNPB to BPBD	before completion of Installation	BNPB		
11	To provide working space for Japanese consultants	during the Project	KOMINFO		
12	To prepare information receiving terminal	during the Project	1) BNPB 2) BPBD 3) Other Organizations 4) Mass Media etc.	1) 10 2) 5,340 3) 15,570 4) 26,360	

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection 4) Periodic exercise of dissemination 5) Allocation of suitable Counterpart	After completion of the installation	KOMINFO		
2	To ensures to obtain the information form InaTeWS of BMKG based on their mutual Agreement (No.399 year 2015 and No.KS301/010/KB/V/2015) and Agreement (No.826/KOMINFO/DJPPI/HK.03/05/205 and KS.301/011/SU/V2015)	After completion of the installation	KOMINFO		
3	To extend the period of the MoU (No.399 year 2015 and No.KS301/010/KB/V/2015) and Agreement (No.826/KOMINFO/DJPPI/HK.03/05/205 and KS.301/011/SU/V2015) which was signed between KOMINFO and BMKG	before the invalidation (2020)	KOMINFO		
4	To extend the period of the MoU and Agreement which was signed by KOMINFO and BNPB 2012 about disaster information dissemination.	before the invalidation (2017)	KOMINFO /BNPB		
5	To enforce and monitor that the regulations of the Ministerial Decree is properly implemented by telecommunication providers		KOMINFO		
6	To enforce telecommunication providers to introduce LBS or CBS as their service to customers		KOMINFO		
7	To give technical support to BNPB and BPBD for operating the software developed by the Project		KOMINFO		
8	To sort out the duplicated communication line and flows of information		KOMINFO		
9	To secure facilities and infrastructure 1) Rental space for servers at Cyber building and NIX 2) Network connection from Cyber building and NIX 3) Electricity for servers 4) IP-VPN (connect to InaTEWS, connect from Cyber building to NIX)		KOMINFO	1)1.056 /year 2)22/year 3)384/year 4)126/year	
10	To secure personnel for monitoring status of transmission for information		KOMINFO	540/year	
11	To secure personnel for monitoring status of transmission for disaster information		BNPB	540/year	
12	To secure IP-VPN line to connect the System		1)BNPB 2)BPBD 3)Other Organizations 4)Mass Media etc.	1)50/year 2)26,914 /year 3)78,473 /year 4)132,854 /year	
13	To realize information dissemination training and exercise.		KOMINFO /BNPB		
14	To promote connection to the System with IP-VPN for BPBD		KOMINFO /BNPB		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

*This page is closed due to the confidentially.

Major Undertakings to be covered by the Japanese Grant

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To provide equipment			
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
	a) Marine(Air) transportation of the products from Japan to the recipient country			
	b) Internal transportation from the port of disembarkation to the project site			
	c) installation and commissioning			
	2) To provide equipment			
	Main Server			
	Backup Server			
	Software			
2	To implement detailed design, tender support and procurement supervision. Consultant and soft components.			
3	Contingencies			
	Total			

*; The cost estimates are provisional. This is subject to the approval of the Government of Japan.

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organization Information

Authority (Signer of the G/A)	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Ministry	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:

1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1-3 Effectiveness and the indicators

- Effectiveness by the Project

Quantitative Effect (Operation and Effect indicators)		
Indicators	Original (Yr)	Target (Yr)
Qualitative Effect		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(M/D)* **Attachment(s):Map**	**Actual:** *(PMR)* **Attachment(s):Map**

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(M/D)	*(M/D)*	*(PMR)* Please state not only th e most updated schedul e but also other past re visions chronologically.

'Soft component' shall be included in 'Items'.		All change of design shal l be recorded regardless of its degree.

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule
2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
[M/D]	*(M/D)*		*(PMR)* As of (Date of Revision)
'Soft component' shall be stated in the column of 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Project Completion Date*			

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

2-3 Undertakings by each Government
2-3-1 Major Undertakings
See Attachment 2.

2-3-2 Activities
See Attachment 3.

2-3-3 Report on RD
See Attachment 4.

2-4 Project Cost
2-4-1 Project Cost
Table 2-3-1 Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities (or Equipment)	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Consulting Services	- Detailed design -Procurement Management -Construction Supervision			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

Table 2-3-2 Comparison of Original and Actual Cost by the Government of XX

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = (local currency)

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

2-5 Organizations for Implementation

2-5-1 Executing Agency:

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original: *(M/D)*
Actual, if changed: *(PMR)*

環境社会配慮で特筆するべき懸念事項やモニタリング事項がある場合、「2-6」に記載の上、定期的に進捗の確認を行う。

2-6 Environmental and Social Impacts

- The results of environmental monitoring as attached in Attachment XX in accordance with Schedule 4 of the Grant Agreement.
- The results of social monitoring as attached in Attachment XX in accordance with Schedule 4 of the Grant Agreement.
- Information on the disclosed results of environmental and social monitoring to local stakeholders, whenever applicable.

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: *(M/D)*
Actual: *(PMR)*

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: *(M/D)*

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on Project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form/Social Monitoring FormMonitoring sheet on price of specified materials (Quarterly)
6. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (Completion Report Only)

KOMINFO

BMKG

KESEPAKATAN BERSAMA
ANTARA
KEMENTERIAN KOMUNIKASI DAN INFORMATIKA
DAN
BADAN METEOROLOGI, KLIMATOLOGI, DAN GEOFISKA
TENTANG
PEMANFAATAN TEKNOLOGI INFORMASI DAN KOMUNIKASI DALAM PENYEBARAN INFORMASI METEOROLOGI, KLIMATOLOGI, DAN GEOFISIKA

NOMOR 399 TAHUN 2015
NOMOR KS.301/010/KB/V/2015

Pada hari ini, Selasa, tanggal dua belas, bulan Mei, tahun dua ribu lima belas, bertempat di Jakarta, yang bertanda tangan di bawah ini:

1. Rudiantara : Menteri Komunikasi dan Informatika, dalam hal ini bertindak untuk dan atas nama Kementerian Komunikasi dan Informatika, yang berkedudukan di Jalan Medan Merdeka Barat Nomor 9, Jakarta Pusat 10110, selanjutnya disebut sebagai PIHAK KESATU.
2. Andi Eka Sakya : Kepala Badan Meteorologi, Klimatologi, dan Geofisika, dalam hal ini bertindak untuk dan atas nama Badan Meteorologi, Klimatologi, dan Geofisika, yang berkedudukan di Jalan Angkasa I, Nomor 2 Kemayoran, Jakarta Pusat 10720, selanjutnya disebut sebagai PIHAK KEDUA.

PIHAK KESATU dan PIHAK KEDUA secara sendiri-sendiri disebut PIHAK dan secara bersama-sama disebut PARA PIHAK terlebih dahulu menerangkan:

a. bahwa PIHAK KESATU adalah instansi pemerintah yang mempunyai tugas melaksanakan urusan pemerintahan di bidang komunikasi dan informatika;
b. bahwa PIHAK KEDUA adalah instansi yang memiliki kewenangan dan kemampuan dalam penyelenggaraan tugas pemerintahan di bidang meteorologi, klimatologi, dan geofisika dan berfungsi memberikan informasi di bidang meteorologi, klimatologi, dan geofisika; dan
c. bahwa PARA PIHAK menyadari pentingnya pemanfaatan teknologi komunikasi dan informasi dalam penyebaran informasi guna mendukung koordinasi pelaksanaan kegiatan penyebaran informasi meteorologi, klimatologi, dan geofisika kepada masyarakat.

Memahami hal-hal tersebut di atas, PARA PIHAK sepakat untuk saling mengikatkan diri dalam sebuah Kesepakatan Bersama dengan ketentuan sebagai berikut:

Pasal 1

Dasar Hukum

1. Undang-Undang Nomor 36 Tahun 1999 tentang Telekomunikasi;
2. Undang-Undang Nomor 32 Tahun 2002 tentang Penyiaran;
3. Undang-Undang Nomor 11 Tahun 2008 tentang Informasi dan Transaksi Elektronik;
4. Undang-undang Nomor 31 Tahun 2009 tentang Meteorologi, Klimatologi, dan Geofisika;
5. Peraturan Pemerintah Nomor 52 Tahun 2000 tentang Penyelenggaraan Telekomunikasi;
6. Peraturan Presiden Nomor 61 Tahun 2008 tentang Badan Meteorologi, Klimatologi, dan Geofisika;
7. Peraturan Menteri Komunikasi dan Informatika Nomor: 17/PER/M.KOMINFO/10/2010 tentang Organisasi dan Tata Kerja Kementerian Komunikasi dan Informatika; dan

8. Peraturan Kepala Badan Meteorologi, Klimatologi, dan Geofisika Nomor 8 Tahun 2014 tentang Kerja Sama di Lingkungan Badan Meteorologi, Klimatologi, dan Geofisika; dan
9. Keputusan Kepala Badan Meteorologi dan Geofisika Nomor 15 Tahun 2014 tentang Organisasi Dan Tata Kerja Balai Besar Meteorologi Klimatologi, Dan Geofisika, Stasiun Meteorologi, Stasun Klimatologi, Dan Stasiun Geofisika.

Pasal 2

Tujuan

Tujuan Kesepakatan Bersama ini adalah sebagai landasan kerja sama dan koordinasi dalam pelaksanaan program kerja PARA PIHAK untuk mewujudkan pemanfaatan teknologi informasi dan komunikasi dalam menyebarluaskan informasi meteorologi, klimatologi, dan geofisika kepada masyarakat.

Pasal 3

Ruang Lingkup

Ruang lingkup Kesepakatan Bersama ini meliputi:
a. penyediaan sarana dan prasarana teknologi informasi dan komunikasi untuk penyebarluasan informasi meteorologi, klimatologi, dan geofisika;
b. penyediaan data dan informasi meteorologi, klimatologi, dan geofisika;
c. koordinasi dan asistensi sumber daya informatika untuk penyediaan informasi meteorologi, klimatologi, dan geofisika;
d. pendampingan dan pengembangan sumber daya manusia; dan
e. penyediaan akses kepada penyelenggara jaringan telekomunikasi dan lembaga penyiaran untuk menyebarkan informasi meteorologi, klimatologi, dan geofisika kepada masyarakat

Pasal 4

Pelaksanaan

(1) Pelaksanaan Kesepakatan Bersama ini akan diatur lebih lanjut dalam Perjanjian Kerja Sama yang mengacu pada Kesepakatan Bersama ini.

(2) Perjanjian Kerja Sama sebagaimana dimaksud pada ayat (1) dibuat selambat-lambatnya 6 (enam) bulan setelah ditandatanganinya Kesepakatan Bersama ini.

Pasal 5

Pembiayaan

Segala biaya yang timbul sebagai akibat dari pelaksanaan Kesepakatan Bersama ini akan diatur dalam Perjanjian Kerja Sama yang ditentukan dan disepakati oleh PARA PIHAK sesuai dengan peraturan perundang-undangan.

Pasal 6

Jangka Waktu

(1) Kesepakatan Bersama ini berlaku untuk jangka waktu 5 (lima) tahun terhitung sejak tanggal ditandatanganinya Kesepakatan Bersama ini.
(2) Kesepakatan Bersama ini dapat diperpanjang dan diakhiri berdasarkan kesepakatan PARA PIHAK.
(3) Untuk perpanjangan Kesepakatan Bersama ini, PARA PIHAK terlebih dahulu melakukan konsultasi atas rancangan Kesepakatan Bersama yang baru selambat-lambatnya 30 (tiga puluh) hari kalender sebelum berakhirnya Kesepakatan Bersama ini.

Pasal 7

Monitoring dan Evaluasi

Monitoring dan evaluasi terhadap pelaksanaan Kesepakatan Bersama ini dilakukan oleh PARA PIHAK secara periodik, paling sedikit 1 (satu) kali dalam 1 (satu) tahun.

Pasal 8

Addendum/amandemen

(1) Hal-hal yang belum diatur dan/atau belum tercakup dalam Kesepakatan Bersama ini akan ditetapkan atas dasar persetujuan PARA PIHAK dalam bentuk *addendum*/amandemen.

(2) *Addendum*/amandemen sebagaimana dimaksud pada ayat (1) merupakan bagian tidak terpisahkan dari Kesepakatan Bersama ini.

Pasal 9

Penutup

Kesepakatan Bersama ini dibuat dalam rangkap 2 (dua) asli, masing masing sama bunyinya serta mempunyai kekuatan hukum yang sama setelah ditandatangani di atas meterai yang cukup oleh PARA PIHAK.

Demikian PARA PIHAK telah menandatangani Kesepakatan Bersama ini pada hari, tanggal, bulan dan tahun di Jakarta seperti telah disebutkan di atas untuk dapat digunakan sebagaimana mestinya.

PIHAK KESATU,	PIHAK KEDUA,
METERAI TEMPEL 02920ADF079800731 6000 ENAM RIBU RUPIAH	
RUDIANTARA	ANDI EKA SAKYA

Pasal 8

Addendum/amandemen

(1) Hal-hal yang belum diatur dan/atau belum tercakup dalam Kesepakatan Bersama ini akan ditetapkan atas dasar persetujuan PARA PIHAK dalam bentuk *addendum*/amandemen.

(2) *Addendum*/amandemen sebagaimana dimaksud pada ayat (1) merupakan bagian tidak terpisahkan dari Kesepakatan Bersama ini.

Pasal 9

Penutup

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PIHAK KESATU,	PIHAK KEDUA,
METERAI TEMPEL 02920ADF079800731 6000 ENAM RIBU RUPIAH	
RUDIANTARA	ANDI EKA SAKYA

Pasal 8

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(2) *Addendum*/amandemen sebagaimana dimaksud pada ayat (1) merupakan bagian tidak terpisahkan dari Kesepakatan Bersama ini.

Pasal 9

Penutup

Kesepakatan Bersama ini dibuat dalam rangkap 2 (dua) asli, masing-masing sama bunyinya serta mempunyai kekuatan hukum yang sama setelah ditandatangani di atas meterai yang cukup oleh PARA PIHAK.

Demikian PARA PIHAK telah menandatangani Kesepakatan Bersama ini pada hari, tanggal, bulan dan tahun di Jakarta seperti telah disebutkan di atas untuk dapat digunakan sebagaimana mestinya.

PIHAK KESATU,	PIHAK KEDUA,
	METERAI TEMPEL 7783DADF079800726 6000 ENAM RIBU RUPIAH
RUDIANTARA	ANDLEKA SAKYA

KOMINFO

BMKG

MUTUAL AGREEMENT

BETWEEN

THE MINISTRY OF COMMUNICATIONS AND INFORMATICS,

AND

THE AGENCY FOR METEOROLOGICAL, CLIMATOLOGICAL, AND GEOPHYSICS

ABOUT

THE UTILIZATION OF TELECOMMUNICATION SYSTEMS IN SPREADING INFORMATION CONCERING METEOROLOGY, CLIMATOLOGY, AND GEOPHYSICS

NUMBER 399 YEAR 2015
NUMBER KS.301/010/KB/V/2015

On this day, Tuesday, the twelfth of day of the month of May, the year of two thousand fifteen, held in Jakarta, the participants who signed are as follows:

1. Rudiantara : Minister of Communication and Informatics, in this matter will act for and on the name of the Ministry of Communication and Informatics, whose office is located at Jalan Medan Merdeka Barat Nomor 9, Jakarta Pusat 10110, and will hereinafter be referred to as the FIRST PARTY

2. Andi Eka Sakya : The Chief of the Agency for Meteorological, Climatological, and Geophysics, in this matter will act for and on the name of the Agency for Meteorological, Climatological, and Geophysics, whose office is located at Jalan Angkasa I, Nomor 2, Kemayoran, Jakarta Pusat 10720, and will hereinafter be referred to as the SECOND PARTY.

The FIRST PARTY and the SECOND PARTY, from hereinafter will together be referred to as ALL THE PARTIES will firstly explain:

a. that the FIRST PARTY is the government agency that has the tasks of government affairs in the field of communication and informatics;
b. that the SECOND PARTY is the agency that has the authority and ability in the administration of government duties in the field of meteorology, climatology, and geophysics and serves to provide information on the field of meteorology, climatology, and geophysics; and
c. that ALL THE PARTIES are aware of the importance of the use of information and communication technology in the dissemination of information to support the coordination of the implementation of information dissemination activities on the fields of meteorology, climatology, and geophysics to the public

Understanding the things mentioned above, ALL THE PARTIES agreed to mutually engage in a Mutual Agreement with the following conditions:

Article 1
Legal Basis

1. Law Number 36 Year 1999 about Telecommunications;
2. Law Number 32 Year 2002 about Broadcasting;
3. Law Number 11 Year 2008 about Information and Electronic Transactions;
4. Law Number 31 Year 2009 about Meteorology, Climatology, and Geophysics;
5. Government Regulation Number 52 Year 2000 about Telecommunications;
6. Presidential Regulation Number 61 Year 2008 about the Agency for Meteorological, Climatological, and Geophysics;
7. Communication and Informatics Minister Regulation Number: 17/PER/M.KOMINFO/10/2010 about Organization and Working Procedures of the Ministry of Communication and Informatics; and
8. Chief of the Agency for Meteorological, Climatological, and Geophysics Regulation Number 8 Year 2014 about the Cooperation in the Field of the Agency for Meteorological, Climatological, and Geophysics; and
9. Chief of the Agency for Meteorological and Geophysics Decision Number 15 Year 2014 about the Organization and Working Procedures of the Agency for Meteorological, Climatological, and Geophysics, Meteorological Station, Climatological Station, and Geophysics Station.

Article 2
Goals

The goal of this Mutual Agreement is a basis for cooperation and coordination in the implementation of the work programs of ALL THE PARTIES to utilize the information and

communication technologies in disseminating information on meteorology, climatology, and geophysics to the public

Article 3
Scope

The scope of this Mutual Agreement includes:

a. providing facilities and infrastructures on information and communication technologies to spread information on meteorology, climatology, and geophysics;
b. providing data and information on meteorology, climatology, and geophysics;
c. coordination and assistance in information resources to provide information on meteorology, climatology, and geophysics;
d. mentoring and development of human resources; and
e. providing a means of access to the operator of telecommunication network and broadcasting to spread information on meteorology, climatology, and geophysics

Article 4
Execution

(1) The Execution of this Mutual Agreement will be organized even further in the Cooperation Agreement, which refers to the Mutual Agreement.
(2) This Mutual Agreement as stated in clause (1) will be made no later than six (6) months after the signing of this Mutual Agreement.

Article 5
Financing

All costs incurred with respect to the implementation of the collaboration agreement is charged to the budget and expenditures of ALL THE PARTIES in accordance with the capacity and authority as well as the provision of statutory regulations.

Article 6
Time Period

(1) This Mutual Agreement is valid for a period of 5 (five) years starting from the date signed, and can be extended as required by agreement of ALL THE PARTIES;
(2) This Mutual Agreement may be extended or terminated based on the agreement of ALL THE PARTIES
(3) In the case of the extension of this Mutual Agreement, prior to the extension ALL THE PARTIES must make a consultation on a new draft on the Mutual Agreement no later than 30 (thirty) days prior to the expiration of the Mutual Agreement.

Article 7
Monitoring and Evaluation

Monitoring and evaluation on the implementation of this Mutual Agreement is done by ALL THE PARTIES periodically, no less than once a year.

Article 8
Addendum / Amendment

(1) The things that are not regulated and/or not yet covered by the Mutual Agreement will be determined on the basis of the consent of ALL THE PARTIES in the form of an *addendum* / amendment
(2) The *addendum* / amendment referred to in clause (1) is an integral part of the Mutual Agreement

Article 9
Closing

This Mutual Agreement is duplicated into 2 (two), each stamped and have the same legal effect after being signed by ALL THE PARTIES

Thus ALL THE PARTIES that have signed this Mutual Agreement on the day, date, month, and year at Jakarta as stated above are able to use this agreement as it is intended.

FIRST PARTY,

METERAI TEMPEL 02020ADF079600731 6000

RUDIANTARA

SECOND PARTY,

ANDI EKA SAKYA

Appendix 5

Soft Component (Technical Assistance) Plan

Japan International Cooperation Agency

Preparatory Survey Report on the Project for Strengthening Disaster Management Information System in the Republic of Indonesia

Soft Component Plan

February 2016

Kokusai Kogyo Co., Ltd.

Contents

Soft Component Plan

1. Background of the Soft Component

This Project will establish a disaster management information communication system. By this system, it can be expected that the early warning information be transmitted rapidly and reliably to organizations concerned with disaster management. This Soft Component is intended to provide technical support to the Ministry of Information and Communication (hereinafter referred to as "KOMINFO") in order to utilize the Project system effectively.

1 – 1 Existing Situation of Disaster Management Information Communication

(1) National disaster management structure

In Indonesia, many types of natural disasters such as earthquakes, tsunamis, floods, landslides frequently occur. When the Indian Ocean Earthquake and Tsunami occurred on December 26, 2004, 230,000 people were killed or missing in 13 countries, including 160,000 people in Indonesia. 3,500 people were killed by the May 2006 Central Java Earthquake and 300 people were killed by a tsunami caused by the July 2006 Java earthquake.

In order to prepare for such large-scale natural disasters, the Indonesian government enacted the National Disaster Management Law in 2007 (Law No. 24, 2007) in order to establish a framework for a national disaster management system.

Furthermore, the Government addressed the cross-sectional, governmental, plan regarding disaster management to strengthen the institutional system for all related government agencies in the National Medium-Term Plan (2010-2014). The National Disaster Management Plan (2010-2014), based on the concept of the Cross-Sectional Government Plan, puts KOMINFO in charge of planning and managing the provision of facilities and infrastructure for communication to support disaster management. BNPB and BPBD, as disaster management administrative agencies, have been working on disaster management by local governments and residents, such as education to raise awareness, evacuation drills, installing signboards for shelters and so on.

(2) System for earthquake and tsunami early warning information communication

In 2011, the Agency for Meteorology, Climatology and Geophysics (BMKG) started the operation of Indonesian Early Warning System (hereinafter referred to as "InaTEWS") to monitor, collect, analyze and deliver early warning information regarding earthquakes and tsunamis. Currently, InaTEWS monitors earthquakes and tsunamis 24 hours a day. When an earthquake occurs, it will deliver the first report within 5 minutes after the earthquake from the Centers of InaTEWS in Jakarta and Bali (a backup facility) nationwide to agencies such as BNPB, BPBD, military, police, local government organizations related to disaster management, mass media, telecommunication carriers and so on.

At the time of the Indian Ocean Earthquake in April 2012 (M8.7), confusion among residents conducting evacuation activities occurred due to bounced and delayed early warning information, caused by congestion

of the communication network in Jakarta and Ache when hit by the earthquake.

This incident highlighted a problem of the current system: the need to better connect information from InaTEWS to actual warning, instruction and/or recommendation to evacuate aimed at residents, rapidly and with certainty.

（３） New Disaster Management Information System by KOMINFO

KOMINFO restructured its internal administration jurisdictions in 2011, and developed new information and communication policies for the development and promotion of information, communication, and ICT infrastructure. The following four topics are included in these new infrastructure policies: promoting development and maintenance of infrastructure and communication lines in villages with no telephone connections, Palapa Ring development, development of infrastructure for e-government, and Nusantara Internet Exchange (hereinafter referred to as “NIX”) development. The Palapa Ring is a network development plan proposing to build seven ring-shaped networks to connect 34 provinces throughout Indonesia with submarine optical cables (35,280 km in total length) and land optical cables (21,807 km in total length). The NIX development plan proposes to establish data centers to provide the environment for utilizing the Palapa Ring in all provinces and major cities across Indonesia.

KOMINFO is responsible for the development of the communication environment in Indonesia as described above, and they have been looking for ways to solve the challenges presented by disaster management information using ICT equipment and technology, which is their own field of responsibility.

BNPB, in its National Disaster Management Plan, defines KOMINFO’s role as the organization “To develop an emergency communication facility”. As a result, KOMINFO and BNPB signed a Memorandum of Understanding (MOU) in June 2012, in which KOMINFO agreed to play an active role in disaster management information communication in the future.

In October 2014, KOMINFO held a Focus Group Discussion with eight other national government institutions including BNPB and BMKG. In the discussion, it was agreed by the Group that KOMINFO would develop the platform for disaster management information communication to deliver early warning information properly to mass media and telecommunication carriers.

In March 2015, KOMINFO set up a plan to develop a Disaster Management Information System (hereinafter referred to as “DMIS”). DMIS will receive early warning information about earthquakes and tsunamis and extreme weather from BMKG, flood information from the Ministry of Public Works (hereinafter referred to as "PU"), volcano information from the Center for Volcanology & Geological Hazard Mitigation Ministry (hereinafter referred to as “PVMBG”), forest fire information from the Ministry of Environment & Forestry (hereinafter referred to as “KEMLHK”), and deliver the information to the appropriate recipient parties.

Equipment to be provided by this Project will form the core of DMIS; it is expected acquire and classify early warning information from InaTEWS and deliver it rapidly and reliably to the related government organizations, mass media and telecommunication carriers in targeted areas.

（4） Management, operation and maintenance of DMIS

KOMINFO, the organization chiefly responsible in operating DMIS, holds a wealth of experience and knowledge in operating and maintaining ICT systems as the responsible government body for ICT in Indonesia.

However, KOMINFO have no experience in handling disaster management information and have no experience in the disaster management field. Accordingly it is necessary to strengthen the capacity of KOMINFO especially regarding disaster management information when the Project installs the system equipment.

The Project system function is to relay information, and the aim is to reduce damages incurred by natural disasters, by constructing and maintaining a system that receives early warning information and transmits it to the related government organizations, mass media and telecommunication carriers, promptly and reliably. Therefore, it is required that not only KOMINFO but also other institutions related to the system acknowledge and play their roles in the system appropriately.

1 – 2 Background on the Soft Component

As described in the previous section, it is required that the related government organizations, mass media and telecommunication carriers play their roles in the Project system appropriately, in the following manner:

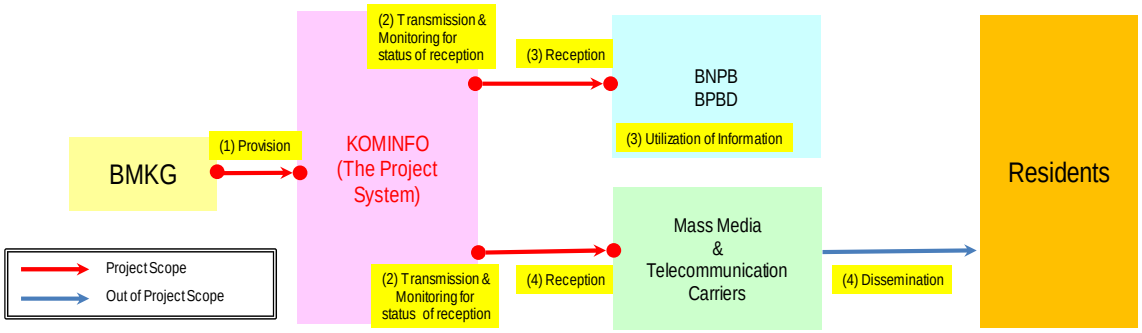
(1) BMKG needs to reliably provide early warning information to this system, as the institution issuing early warning information.

(2) KOMINFO needs to transmit early warning information to the related government organizations, mass media and telecommunication carriers and monitor the recipients' reception status.

(3) BNPB and BPBD needs to reliably receive early warning information from the system, utilize the information effectively in their communication with the residents and in decision-making for the evacuation of residents, as disaster management organizations.

(4) Mass media and telecommunication carriers need to reliably disseminate early warning information to residents through their respective media.

Roles of government related or Organizations, mass media and telecommunication carriers in the Project system



*Numbers correspond to description of organizational roles above.

One of KOMINFO's important functions within the Project system is to monitor and manage transmission

status as the main organization operating the system. The information must be reliably delivered by the system to the related government organizations as well as mass media and telecommunication carriers. To achieve this, related organizations must understand the flow of early warning information transmitted by the system and play their roles appropriately.

However, KOMINFO have no experience in handling disaster management information and have no experience in the disaster management field. Therefore it is assumed to be difficult for KOMINFO to implement and manage the system appropriately without being strengthened in capacity. Implementation of a Soft Component accordingly has be planned, to make up for the shortage of capacity in KOMINFO in this field, and as a technical assistance that will ultimately enable the related government organizations, mass media and telecommunication carriers to utilize the system according to their roles.

The related government organizations, mass media and telecommunication carriers also face challenges described below towards procuring and operating the Project system. The Soft Component aims to build the capacity of KOMINFO to solve these challenges through technical assistance.

Challenge 1: BMKG must reliably provide early warning information

The Project system is designed to transmit early warning information of earthquakes and tsunamis issued by InaTEWS. For the system to work effectively, early warning information from InaTEWS must be delivered to the system.

KOMINFO staff must raise awareness among InaTEWS system operators of the importance of the Project system, the need for InaTEWS information, and how to operate and send information to the system. In particular, KOMINFO and BMKG must develop a common understanding regarding the procedure in the event of transmission failure, and become proficient in this procedure before the system is actually running.

Challenge 2: BNPB must monitor transmission confirmation status at BPBDs

BNPB, as the national disaster management organization, is responsible for leading the chain of command in the delivery of disaster management information to BPBD across multiple provinces, in case of large-scale disasters. BNPB is therefore the organization that will need to confirm that BPBDs have successfully received early warning information. In order to utilize the system effectively, KOMINFO staff must train BNPB on the method of monitoring the reception status of BPBDs.

Challenge 3: BPBD must receive early warning information with certainty

BPBDs, as disaster management agencies of provinces, districts and cities, commands disaster management activities, disseminates early warning information to residents, and advises the head of local governments on decisions regarding the evacuation of residents.

KOMINFO staff must make BPBD staff understand how to reliably receive early warning information, in order to utilize this system effectively.

Challenge 4: Mass media and telecommunication carriers must receive early warning information with certainty

Mass media such as TV and radio stations and telecommunication carriers must receive the information from the system and disseminate it to residents, promptly and reliably, thorough their media.

KOMINFO staff must make mass media and telecommunication carriers understand how to reliably receive early warning information, in order to use the system effectively.

The full effectiveness of this system will be achieved when early warning information is disseminated to residents, promptly and reliably, through television and radio media as well as telecommunication carriers.

2. Target of the Soft Component

The target of the Soft Component is "KOMINFO obtains the skill to transfer the necessary knowledge for the system operation to the related government organizations, mass media and telecommunication carriers." The overall goal is "Disaster Management Information System considered to procure in the preparation survey is appropriately operated."

3. Output of the Soft Component

The outputs (direct outputs) to be achieved at the time of completion of the Soft Component are as follows:

Output 1: KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual.

Output 2: KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and tsunami information to the Project system to be procured) to BMKG.

Output 3: KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.

Output 4: KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to BPBD.

Output 5: KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to mass media and telecommunication carriers.

4. Methods to verify the Achievement of Output

The Soft Component builds the capacity of KOMINFO to fulfil their responsibilities to operate and manage the system smoothly. Indicators and methods to verify the achievement of the output of the Soft Component are set up as shown in the below table:

Achievement of Output

No.	Output	Indicators to verify the achievement of output	Methods to verify the achievement of output (Draft)
Output 1	KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual	・The contents and skills in the Training-of-Trainers Manual is acquired through the Training of Trainers. ・The Disaster Information Utilization Manual is prepared (including the Project system outline, operation methods and roles of the related government organizations, mass media and telecommunication carriers in the system.)	・Training-of-Trainers Manual ・Disaster Information Utilization Manual
Output 2	KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and tsunami information to the procured system) to BMKG	・The System Operation Training for BMKG fulfills the requirement of the consultant.	・Disaster Information Utilization Manual for BMKG ・Assessment check list for System Operation Training
Output 3	KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.	・The System Operation Training for BNPB fulfills the requirement of the consultant. ・System Operation Drills for BNPB are properly conducted.	・Disaster Information Utilization Manual for BNPB ・Assessment check list for System Operation Training ・Records of the System Operation Drill
Output 4	KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to BPBD.	・The System Operation Training for BPBD fulfills the requirement of the consultant. ・System Operation Drills for BPBD are properly conducted.	・Disaster Information Utilization Manual for BPBD ・Assessment check list for System Operation Training ・Records of the System Operation Drill
Output 5	KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to mass media and telecommunication carriers.	・The System Operation Training for mass media and telecommunication carriers fulfills the requirement of the consultant. ・System Operation Drills for mass media and telecommunication carriers are properly conducted.	・Disaster Information Utilization Manual for mass media and telecommunication carriers ・Assessment check list for System Operation Training ・Records of the System Operation Drill

5. Soft Component Activities (Input Plan)

5 – 1 Activity Types

Activities by the Soft Component include implementing training courses; making Training-of-Trainers Manuals for KOMINFO; and supporting KOMINFO in their training activities for the related government organizations, mass media and telecommunication carriers such as BMKG, BNPB, BPBD, mass media and telecommunication carriers using Disaster Information Utilization Manuals. After all of the planned training courses have taken place, KOMINFO and the related government organizations, mass media and telecommunication carriers shall carry out a joint training session for communication using the system. The Japanese consultant shall be involved in all of the above activities. The Soft Component will build the capacity of KOMINFO to give technical guidance to the related government organizations, mass media and telecommunication carriers regarding the system even after completion of Soft Component activities.

Output 1	KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual.	⇒ Activity 1 : Training of Trainers for KOMINFO Activity 2 : Preparation of Disaster Information Utilization Manuals through collaborative work between Japanese Consultant and KOMINFO
Output 2	KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and tsunami information to the procured system) to BMKG.	⇒ Activity 3 : Supporting System Operation Training for BMKG
Output 3	KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.	⇒ Activity 4 : Supporting System Operation Training for BNPB Activity 7 : Supporting System Operation Drill using the system with BNPB
Output 4	KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to BPBD	⇒ Activity 5 : Supporting System Operation Training for BPBD Activity 7 : Supporting System Operation Drill using the system with BPBD
Output 5	KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to mass media and telecommunication careers.	⇒ Activity 6 : Supporting System Operation Training for mass media and communication carriers Activity 7 : Supporting System Operation Drill using the system with mass media and communication carriers

5 – 2 Contents of Activities

Output 1: KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual.

Activity 1: Training of Trainers for KOMINFO

KOMINFO is the implementing organization of the Project and responsible for the operation of the Project system. KOMINFO is also in the position to continue monitoring the related government organizations, mass media and telecommunication carriers' use of the system even after completion of Soft Component activities. Thus in this activity, KOMINFO as the counterpart organization, will receive a Training of Trainers from the consultant. The training would comprehend the overview of the Project system so that they may smoothly conduct System Operation Training for other the related government organizations, mass media and telecommunication carriers playing a role in the system, and use the "Training-of-Trainers Manual". This manual shall be prepared by the Japanese Consultant prior to the training, in Japan, and shall be revised and improved, and the methods and contents of the System Operation Training established, through collaboration between the Consultant and KOMINFO staff.

Implementer	Format	Target participants	Location	Planned input (hours)	Planned input (days)
Japanese Consultant	Preparation of Manual	-	JAPAN	70h（7h×10days）	10 days
Japanese Consultant	Training	KOMINFO	KOMINFO	35h（7h×5days）	5 days
				Total	15 days

Activity 2: Preparation of the Disaster Information Utilization Manual as collaboration work between Japanese Consultant and KOMINFO

After conducting Training of Trainers for KOMINFO staff as described above as Activity 1, KOMINFO will prepare the "Disaster Information Utilization Manual" (hereinafter referred to as the "Manual", English and Indonesian versions) in collaboration with the Japanese Consultant. The Manual shall be tailored as text materials for planned training courses targeting the related government organizations, mass media and telecommunication carriers such as BNPB, BPBD, mass media and telecommunication carriers.

The Manual shall address the following topics: overview of the Project system, roles of the related government organizations, mass media and telecommunication carriers in the system and necessity of collaboration between organizations, suggested ways of utilization of the system (tailored for target organizations), as well as tailored how-to sections on System Operation Drills and scalability (how to add other disaster information types) and so on.

KOMINFO should develop the ability to prepare a Manual by themselves when other types of disaster information are added into the system in the future.

Implementer	Format	Target participants	Location	Planned input (hours)	Planned input (days)
Japanese Consultant	Preparation of Manual	KOMINFO	KOMINFO	140h（7h× 20days)	20 days
				Total	20 days

Output 2: KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and tsunami information to the procured system) to BMKG.

Activity 3: Supporting System Operation Training for BMKG

KOMINFO Staff trained in the Training of Trainers by the Consultant will conduct training courses for BMKG as trainers, using the "Disaster Information Utilization Manual". As described above, BMKG is the organization which provides early warning information to the system. Accordingly the training session for BMKG shall focus on developing a good understanding among BMKG operators regarding the outline of the system, and in particular how information is received from BMKG by the system. It is especially important in the training session to focus on the procedures to respond to incidents when the information is not received correctly by the system.

The Consultant shall evaluate the effects of the System Operation Training held by KOMINFO staff, with a view to support KOMINFO in implementing System Operation Training after the completion of Soft Component activities.

Implementer	Format	Target participants	Location	Planned input (hours)	Planned input (days)
KOMINFO Japanese Consultant	Training	BMKG	BMKG	7h	1 day
				Total	1 day

Output 3: KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.

Activity 4: Supporting System Operation Training for BNPB

KOMINFO Staff trained in the Training of Trainers by the Consultant will conduct training courses for BNPB. BNPB is the national disaster management organization and the system will allow BNPB to monitor reception status of early warning information by BPBDs. KOMINFO staff must train BNPB on how to operate the system to ensure reception of early warning information themselves, and the method of monitoring the reception status of BPBDs

The Consultant shall evaluate the effects of the System Operation Training held by KOMINFO staff, with a view to support KOMINFO in implementing System Operation Training after the completion of Soft

Component activities. In addition, the system is expected to include a function for a System Operation Drill to be conducted, by generating a mock disaster situation to train BNPB and other organizations in their initial response to disaster information.

The system will ensure that the related government organizations, mass media and telecommunication carriers receive the System Operation Drill periodically, twice a year. BNPB shall practice the drill using the skills developed through the System Operation Training.

The Drill is expected to lead to the improvement of in overall disaster management, by increasing BNPB's awareness as well as strengthening cooperation between BNPB and other the related government organizations, mass media and telecommunication carriers.

Implementer	Format	Target participants	Location	Planned input (hours)	Planned input (days)
KOMINFO Japanese Consultant	Training	BNPB	BNPB	7h×2 times	2 days
KOMINFO Japanese Consultant	System Operation Drill	BNPB	BNPB	7h	1 day
				Total	3days

Output 4: KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to BPBD.

Activity 5: Supporting System Operation Training for BPBD

KOMINFO staff trained in the Training of Trainers by the Consultant will conduct training courses for BPBDs.

BPBDs, as disaster management agencies of provinces, districts and cities, commands disaster management activities, and are responsible for the dissemination of early warning information to residents.

KOMINFO staff must make BPBD staff understand how to reliably receive early warning information, in order to utilize this system effectively. It is therefore required that BPBDs develop operational skills to receive earthquake and tsunami information from the system with certainty.

The Consultant shall evaluate the effects of the System Operation Training held by KOMINFO staff, with a view to support KOMINFO in implementing System Operation Training after the completion of Soft Component activities.

In addition, the system is expected to include a function for a System Operation Drill to be conducted, by generating a mock disaster situation to train BNPB and other organizations in their initial response to disaster information.

The system will ensure that the related government organizations, mass media and telecommunication carriers receive the System Operation Drill periodically, twice a year.

BPBDs shall practice the drill using the skills developed through the System Operation Training.

The Drill is expected to lead to the improvement of in regional disaster management, by increasing BPBD's awareness as well as strengthening cooperation between BPBDs and other the related government organizations, mass media and telecommunication carriers.

Implementer	Format	Target participants	Location	Planned input (hours)	Planned input (days)
KOMINFO Japanese Consultant	Training	BPBD	KOMINFO	7h	1day
KOMINFO Japanese Consultant	System Operation Drill	BPBD	KOMINFO	7h	1day
				Total	2days

Output 5: KOMINFO obtains the skill to transfer the method (how to securely receive the earthquake and tsunami information) to mass media and telecommunication careers.

Activity 6: Supporting System Operation Training for mass media and telecommunication carriers

KOMINFO staff trained in the Training of Trainers by the Consultant will conduct training courses for mass media and telecommunication carriers, using the "Disaster Information Utilization Manual".

Mass media and telecommunication carriers have an obligation to disseminate information about natural disasters and the early warning of disasters. It is therefore required that mass media and telecommunication carriers obtain the operational skills to receive earthquake and tsunami information from the system with certainty, through System Operation Training.

The Consultant shall evaluate the effects of the System Operation Training held by KOMINFO staff, with a view to support KOMINFO in implementing System Operation Training after the completion of Soft Component activities.

In addition, the system is expected to include a function for a System Operation Drill to be conducted, by generating a mock disaster situation to train mass media and telecommunication carriers and other organizations in their initial response to disaster information.

The system will ensure that the related government organizations, mass media and telecommunication carriers receive the System Operation Drill periodically, twice a year. Mass media and telecommunication carriers shall practice the drill using the skills developed through the System Operation Training.

The Drill is expected to lead to the improvement of in overall disaster management, by increasing mass media and telecommunication carriers' awareness and as well as strengthening cooperation between mass media, telecommunication carriers and other related government organizations.

Implementer	Format	Target participants	Location	Planned input (hours)	Planned input (days)
KOMINFO Japanese Consultant	Training	Mass Media and Telecommunication Carriers	KOMINFO	7h	1 day
KOMINFO Japanese Consultant	System Operation Drill	Mass Media and Telecommunication Carriers	KOMINFO	7h	1 day
				Total	2 days

Activity Plan

Output	Activities	Target audience	Contents of activities	Feature/Place	Implementer	Outputs
Output 1	1	KOMINFO	Japanese Consultant implements the Training of Trainers for the KOMINFO staff by using the Training-of-Trainers Manual. (Through the Training, KOMINFO transfer the system operation methods to the related government organizations, mass media and telecommunication carriers smoothly.)	Training of Trainers / KOMINFO	Japanese consultant	Output 1: Training-of-Trainers Manual
	2		KOMINFO staff prepare the Disaster Information Utilization Manual in cooperation with Japanese Consultant. (Through this activity, KOMINFO staff comprehend the system outline, system operation methods and learn techniques how to transfer to the related government organizations, mass media and telecommunication carriers.)	Preparation of the Disaster Information Utilization Manual / KOMINFO	Japanese consultant KOMINFO staff	Output 1: Disaster Information Utilization Manual
Output 2	3	BMKG	KOMINFO staff implement the System Operation Training to transfer the system operation method to BMKG.	System Operation Training / BMKG	KOMINFO staff Japanese consultant	Output 2: Disaster Information Utilization Manual for BMKG Output 2: Assessment check list for the System Operation Training
Output 3	4	BNPB	KOMINFO staff implement the System Operation Training to transfer the system operation method to BNPB.	System Operation Training / BNPB	KOMINFO staff Japanese Consultant	Output 3: Disaster Information Utilization Manual for BNPB Output 3: Check list to assess the performance of KOMINFO in the Training
	7		BNPB and KOMINFO implement the System Operation Drill to check the response to a mock disaster situation regularly. (Approximately 2 times/year)	System Operation Drill / BNPB and KOMINFO	KOMINFO staff Japanese Consultant	Output 3: Records of the System operation drill
Output 4	5	BPBD	KOMINFO staff implement the System Operation Training to transfer the system operation method to BPBD.	System Operation Training / BPBD	KOMINFO staff Japanese consultant	Output 4: Disaster Information Utilization Manual for BPBD Output 4: Check list to assess the performance of KOMINFO in the Training
	7		BPBD and KOMINFO implement the System Operation Drill to check the initial response to a mock disaster situation regularly (Approximately 2 times/year).	System Operation Drill / BPBD and KOMINFO	KOMINFO staff Japanese consultant	Output 4: Records of the System operation drill
Output 5	6	Mass Media and Telecommunication Carriers	KOMINFO staff implement the System Operation Training to transfer the system operation method to mass media and telecommunication carriers.	System Operation Training / KOMINFO	KOMINFO staff Japanese consultant	Output 5: Disaster Information Utilization Manual for Mass media and Telecommunication carriers Output 5:Check list to assess the performance of KOMINFO in the Training
	7		Mass media, telecommunication carriers and KOMNFO implement the System Operation Drill to check the initial response to a mock disaster situation regularly (Approximately 2 times/year).	System Operation Drill / Mass media, telecommunication carriers and KOMINFO	KOMINFO staff Japanese consultant	Output 5: Records of the System Operation Drill

6. Procurement of Resources for implementing the Soft Component

Resources necessary for the implementation of Soft Component activities are as follows:

(1) Japanese consultant

A Japanese Consultant shall manage and oversee the whole processes of the Soft Component activities, such as preparation, instruction, supervising, compiling results, evaluation, reporting and so on. At least one dedicated staff shall be assigned from Consultant team to Soft Component activities. It is preferable that the assigned person have experience and knowledge in running Soft Components, disaster management

information systems and the country in general.

(2) KOMINFO

Around three persons in KOMINFO should be selected in cooperation with the Consultant as trainers of the Soft Component. KOMINFO staff should have the capacity to transfer knowledge and methods of operation regarding the Project system to operational staff in other related government organizations so that they may operate the system smoothly.

KOMINFO staff are expected to receive the Training of Trainers from Japanese Consultant, prepare the "Disaster Information Utilization Manual" (in English) in cooperation with the Consultant, and then create its Indonesian version. KOMINFO staff will subsequently conduct the System Operation Training for the related government organizations, mass media and telecommunication carriers, based on the "Disaster Information Utilization Manual" that they developed, and are expected to continue giving the training activities, as necessary, even after the completion of the Soft Component.

7. Implementation Process of the Soft Component

Activities of the Soft Component can be categorized as:

- Preparation for the Training of Trainers targeting KOMINFO staff, i.e. preparation of the Training-of-Trainers Manual in Japan by the Consultant,
- Training of Trainers of KOMINFO staff by the Consultant,
- Preparation of the "Disaster Information Utilization Manual" jointly by the Consultant and KOMINFO staff,
- Conducting System Operation Training, including System Operation Drills, for the related government organizations, mass media and telecommunication carriers by KOMINFO staff.

The number of days required for each task is: 10 days, 5 days, 20 days respectively for the first three tasks listed above.

The System Operation Training of personnel at the related government organizations, mass media and telecommunication carriers by KOMINFO is expected to take one day each for BMKG, BPBD, mass media as a group, and telecommunication carriers as a group. BNPB requires two days of instruction, one for System Operation Training, and one on monitoring transmission confirmation to BPBD. In addition, the System Operation Drill using the installed function within the Project system is expected to take a day each for BNPB, BPBD, mass media as a group, and telecommunication carriers as a group.

The System Operation Training for BPBD shall be conducted for operation staff from BPBDs in the Jakarta Special Capital Region (about 15 operators, two each from 7 to 8 BPBDs). KOMINFO is expected to continue System Operation Training for other Regions by themselves.

Number of days required for the Soft Component (for the consultant)

Activities	Activity items	Numbers of days for the activities		Implementer & Target audience	Target participants
		Japan	Indonesia		
1	Preparation of Training-of-Trainers Manual	10 days	-	Japanese consultant	-
2	Traveling (Tokyo-Jakarta)	-	1 day	-	-
3	Training of Trainers for KOMINFO	-	5 days	Japanese consultant ⇒KOMINFO	Approximately 3 staff from KOMINFO
4	Preparation of the Disaster Information Utilization Manual as collaboration work between the consultant and KOMINFO staff	-	20 days		Approximately 3 staff from KOMINFO
5	Supporting System Operation Training for BMKG	-	1 day	KOMINFO ⇒The related government organizations, mass media and telecommunication carriers	Approximately 10 staff from BMKG
6	Supporting System Operation Training for BNPB	-	2 days		Person in charge of BNPB (System Operation/Monitoring of the transmission status)
7	Supporting System Operation Training for BPBD	-	1 day		Approximately 15 staff from BPBD
8	Supporting System Operation Training for mass media and telecommunication carriers	-	1 day		Approximately 10 staff from mass media and telecommunication carriers
9	Supporting System Operation Drill	-	1 day		BNPB
		-	1 day		BPBD
		-	1 day		Mass media and telecommunication carriers
10	Traveling (Jakarta-Tokyo)	-	1 day	-	-
Japan/Indonesia Subtotal		10 days	35 days	-	-
Total		45 days		-	-

8. Outputs of the Soft Component

Expected tangible outputs from the Soft Component activity are shown below:

● At completion: Completion Report (For Indonesian and Japanese sides)

● For each period of dispatch of Japanese Consultants: Soft Component Progress Report

● Activity 1: Training of Trainers for KOMINFO staff:
Training-of-Trainers Manual

● Activity 2: Preparation of Disaster Information Utilization Manual:
Disaster Information Utilization Manual for System Operation Training, targeted towards the related government organizations, mass media and telecommunication carriers including instructions for the System Operation Drill

● Activity 3: (Supporting) System Operation Training for BMKG:
Disaster Information Utilization Manual for BMKG
Assessment check list for System Operation Training

● Activity 4: (Supporting) System Operation Training for BNPB:
Disaster Information Utilization Manual for BNPB
Assessment check list for System Operation Training
● Activities 5: (Supporting) System Operation Training for BPBDs:
Disaster Information Utilization Manual for BNPB
Assessment check list for System Operation Training
●Activity 6: (Supporting) System Operation Training for mass media and telecommunication carriers:
Disaster Information Utilization Manual for mass media and telecommunication carriers
Assessment check list for System Operation Training
● Activity 7: System Operation Drill:
Record of the System Operation Drill

9. Approximate Estimate of the Soft Component Costs

Approximate estimate of the Soft Component costs are shown as following:

Soft Component costs

Item	Cost (yen)
Direct Personnel Cost	1,420,960
Direct Cost	1,193,567
Overhead	1,818,828
Total	4,433,355

10. Responsibility of the Recipient Country

In order to achieve the target of the Soft Component, it is essential for KOMINFO to actively join in managing and carrying out Soft Component programs, such as System Operation Training and the System Operation Drills. It is also important that a sufficient number of staff from the related government organizations, mass media and telecommunication carriers join the Soft Component programs, such as training sessions and the System Operation Drills.

The responsibilities of each government related organization, mass media and telecommunication carriers are summarized as follows:

[KOMINFO]

- Management of the Soft Component programs in cooperation with the Consultant.
- Requesting cooperation to the related government organizations, mass media and telecommunication carriers for Soft Component program implementation.
- Provision of staff to organize Soft Component program activities, as well as their expenses including travelling expenses, transportation costs, travelling allowance, accommodation costs and so on,
- Provision of supporting personnel, training locations (venues) and expenses for holding training sessions as well as System Operation Drills,
- Continuing to hold training sessions and drills, autonomously, after completion of Soft Component activities,
- Translating the Disaster Information Utilization Manual into Indonesian.

[BMKG, BNPB, BPBD, mass media and telecommunication carriers]

- Provision of personnel to participate in Soft Component program activities, as well as their expenses including travelling expenses, transportation costs, travelling allowance, accommodation costs and so on,
- Continued and periodical participation in training and drill activities held by KOMINFO after completion of Soft Component activities.

Holding training sessions and drill activities in the Soft Component will be difficult if KOMINFO and other organizations do not budget travelling and other expenses for the staff participating in the activities. It is therefore important that all concerned organizations ensure proper budget proposal are submitted in the fiscal year preceding the activities, with the timing to be considered according to the implementation progress of the Project as well as the Soft Component.

Annex 1

PDM for the Soft Component

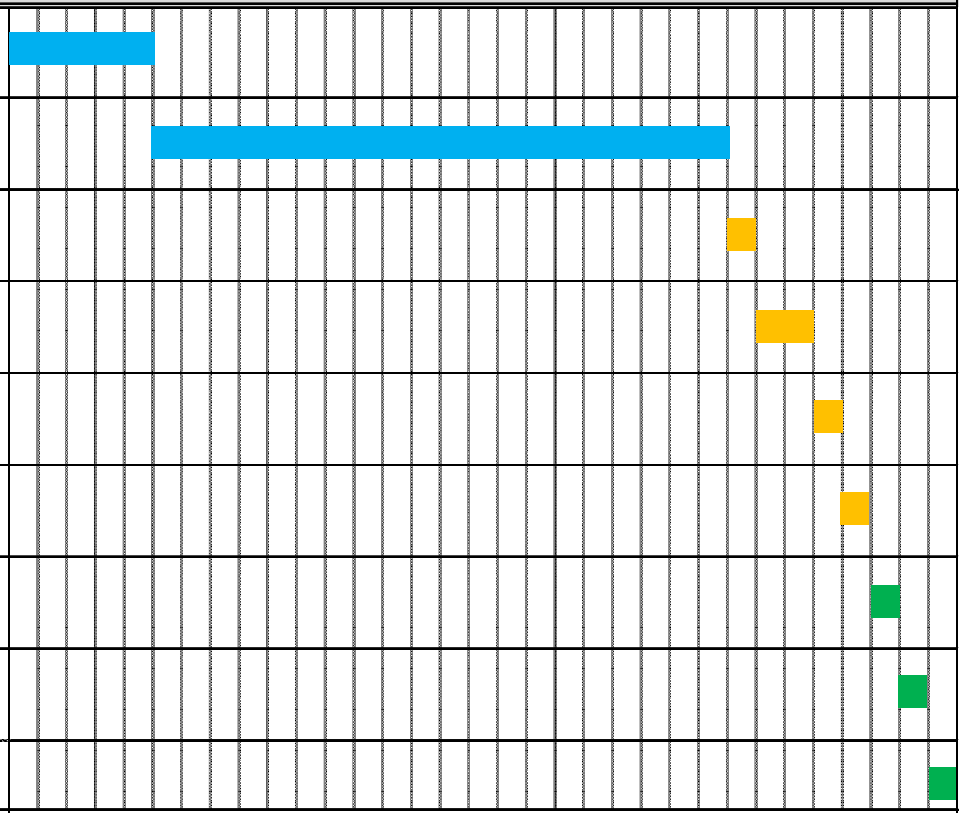
Summary of the Project	Indicator	Measurement	External condition
Overall goal Disaster Management Information System considered to procure in the preparation survey is appropriately operated.	・Role and cooperation in the Project system is comprehended by the related government organizations, mass media and telecommunication carriers. ・The Project system is operated stably by the related government organizations, mass media and telecommunication carriers.	・Questionnaire to the related government organizations, mass media and telecommunication carriers ・Records of the System Operation Drill	
Target of the Soft Component KOMINFO obtains the skill to transfer the necessary knowledge for the system operation to the related government organizations, mass media and telecommunication carriers.	・The necessary knowledge and skill for smooth operation is transferred to the related government organizations, mass media and telecommunication carriers through the System Operation Training. ・The System Operation Drills with the related government organizations, mass media and telecommunication carriers are conducted by KOMINFO.	・Training-of-Trainers Manual ・Disaster Information Utilization Manual (common manual for the related government organizations, mass media and telecommunication carriers, including the method of the System Operation Drill) ・Records of the System Operation Drill	Role of the related government organizations, mass media and telecommunication carriers is not modified in the disaster management information system.
Output 1. KOMINFO obtains the skill to prepare and update the Disaster Information Utilization Manual.	1.1 The contents and skills in the Training-of-Trainers Manual is acquired through the Training of Trainers. 1.2 The Disaster Information Utilization Manual is prepared (including the Project system outline, operation methods and the roles of related government organizations, mass media and telecommunication carriers in the system.	・Training-of-Trainers Manual ・Disaster Information Utilization Manual	Sufficient cooperation for the Project activities is obtained from the related government organizations, mass media and telecommunication carriers.
2. KOMINFO obtains the skill to transfer the method (how to promptly send earthquake and tsunami information to the Project system to be procured) to BMKG.	2.1 The System Operation Training for BMKG fulfills the requirement of the consultant.	・Disaster Information Utilization Manual for BMKG ・Assessment check list for the System Operation Training	
3. KOMINFO obtains the skill to transfer the method (how to appropriately monitor the reception status of earthquake and tsunami information) to BNPB.	3.1 The System Operation Training for BNPB fulfills the requirement of the consultant. 3.2 System Operation Drills for BNPB are properly conducted.	・Disaster Information Utilization Manual for BNPB ・Assessment check list for the System Operation Training ・Records of the System Operation Drill	
4. KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and	4.1 The System Operation Training for BPBD fulfills the requirement of the consultant.	・Disaster Information Utilization Manual for BPBD	

tsunami information) to BPBD.	4.2 System Operation Drills for BPBD are properly conducted.	・Assessment check list for the System Operation Training ・Records of the System Operation Drill	
5. KOMINFO obtains the skill to transfer the method (how to securely receive earthquake and tsunami information) to mass media and telecommunication carriers.	5.1 The System Operation Training for mass media and telecommunication carriers fulfills the requirement of the consultant. 5.2 System Operation Drills for mass media and telecommunication carriers are properly conducted.	・Disaster Information Utilization Manual for mass media and telecommunication carriers ・Assessment check list for the System Operation Training ・Records of the System Operation Drill	
Activities			Precondition
1: Training of Trainers for KOMINFO 2: Preparation of the Disaster Information Utilization Manual as collaboration work between Japanese consultant and KOMINFO 3: Supporting System Operation Training for BMKG 4: Supporting System Operation Training for BNPB 5: Supporting System Operation Training for BPBD 6: Supporting System Operation Training for mass media and telecommunication carriers 7: Supporting System Operation Drill using the system			The related government organizations, mass media and telecommunication carriers take part in the Project activities positively.

Annex 2

Outline of the implementation plan of the Soft Component (operation in Indonesia)

Activities	Activity items	Implementer & Target audience	Numbers of days for the activities
1	Training of Trainers for KOMINFO	The Consurtant⇒KOMINFO (Jakarta)	5 days
2	Preparation of the Disaster Information Utilization Manual as collaboration work between the Consultant and KOMINFO staff		20 days
3	Supporting (KOMINFO to hold) the System Operation Training for BMKG	KOMINFO⇒ The related government organizations, mass media and telecommunication carriers (Jakarta)	1 day
4	Supporting System Operation Training for BNPB		2 days
5	Supporting System Operation Training for BPBD		1 day
6	Supporting System Operation Training for mass media and telecommunication carriers		1 day
7	Supporting System Operation Drill for BNPB		1 day
	Supporting System Operation Drill for BPBD		1 day
	Supporting System Operation Drill for mass media and telecommunication carriers		1 day
Total			33 days



Appendix 6

Other Relevant Data

Appendix 6-1

Mutual Agreement

between KOMINFO and BMKG

MUTUAL AGREEMENT

BETWEEN

THE MINISTRY OF COMMUNICATIONS AND INFORMATICS,

AND

THE AGENCY FOR METEOROLOGICAL, CLIMATOLOGICAL, AND GEOPHYSICS

ABOUT

THE UTILIZATION OF TELECOMMUNICATION SYSTEMS IN SPREADING INFORMATION CONCERING METEOROLOGY, CLIMATOLOGY, AND GEOPHYSICS

NUMBER 399 YEAR 2015
NUMBER KS.301/010/KB/V/2015

On this day, Tuesday, the twelfth of day of the month of May, the year of two thousand fifteen, held in Jakarta, the participants who signed are as follows:

1. Rudiantara : Minister of Communication and Informatics, in this matter will act for and on the name of the Ministry of Communication and Informatics, whose office is located at Jalan Medan Merdeka Barat Nomor 9, Jakarta Pusat 10110, and will hereinafter be referred to as the FIRST PARTY

2. Andi Eka Sakya : The Chief of the Agency for Meteorological, Climatological, and Geophysics, in this matter will act for and on the name of the Agency for Meteorological, Climatological, and Geophysics, whose office is located at Jalan Angkasa I, Nomor 2, Kemayoran, Jakarta Pusat 10720, and will hereinafter be referred to as the SECOND PARTY.

The FIRST PARTY and the SECOND PARTY, from hereinafter will together be referred to as ALL THE PARTIES will firstly explain:

a. that the FIRST PARTY is the government agency that has the tasks of government affairs in the field of communication and informatics;
b. that the SECOND PARTY is the agency that has the authority and ability in the administration of government duties in the field of meteorology, climatology, and geophysics and serves to provide information on the field of meteorology, climatology, and geophysics; and
c. that ALL THE PARTIES are aware of the importance of the use of information and communication technology in the dissemination of information to support the coordination of the implementation of information dissemination activities on the fields of meteorology, climatology, and geophysics to the public

Understanding the things mentioned above, ALL THE PARTIES agreed to mutually engage in a Mutual Agreement with the following conditions:

Article 1
Legal Basis

1. Law Number 36 Year 1999 about Telecommunications;
2. Law Number 32 Year 2002 about Broadcasting;
3. Law Number 11 Year 2008 about Information and Electronic Transactions;
4. Law Number 31 Year 2009 about Meteorology, Climatology, and Geophysics;
5. Government Regulation Number 52 Year 2000 about Telecommunications;
6. Presidential Regulation Number 61 Year 2008 about the Agency for Meteorological, Climatological, and Geophysics;
7. Communication and Informatics Minister Regulation Number: 17/PER/M.KOMINFO/10/2010 about Organization and Working Procedures of the Ministry of Communication and Informatics; and
8. Chief of the Agency for Meteorological, Climatological, and Geophysics Regulation Number 8 Year 2014 about the Cooperation in the Field of the Agency for Meteorological, Climatological, and Geophysics; and
9. Chief of the Agency for Meteorological and Geophysics Decision Number 15 Year 2014 about the Organization and Working Procedures of the Agency for Meteorological, Climatological, and Geophysics, Meteorological Station, Climatological Station, and Geophysics Station.

Article 2
Goals

The goal of this Mutual Agreement is a basis for cooperation and coordination in the implementation of the work programs of ALL THE PARTIES to utilize the information and

communication technologies in disseminating information on meteorology, climatology, and geophysics to the public

Article 3
Scope

The scope of this Mutual Agreement includes:

a. providing facilities and infrastructures on information and communication technologies to spread information on meteorology, climatology, and geophysics;
b. providing data and information on meteorology, climatology, and geophysics;
c. coordination and assistance in information resources to provide information on meteorology, climatology, and geophysics;
d. mentoring and development of human resources; and
e. providing a means of access to the operator of telecommunication network and broadcasting to spread information on meteorology, climatology, and geophysics

Article 4
Execution

(1) The Execution of this Mutual Agreement will be organized even further in the Cooperation Agreement, which refers to the Mutual Agreement.
(2) This Mutual Agreement as stated in clause (1) will be made no later than six (6) months after the signing of this Mutual Agreement.

Article 5
Financing

All costs incurred with respect to the implementation of the collaboration agreement is charged to the budget and expenditures of ALL THE PARTIES in accordance with the capacity and authority as well as the provision of statutory regulations.

Article 6
Time Period

(1) This Mutual Agreement is valid for a period of 5 (five) years starting from the date signed, and can be extended as required by agreement of ALL THE PARTIES;
(2) This Mutual Agreement may be extended or terminated based on the agreement of ALL THE PARTIES
(3) In the case of the extension of this Mutual Agreement, prior to the extension ALL THE PARTIES must make a consultation on a new draft on the Mutual Agreement no later than 30 (thirty) days prior to the expiration of the Mutual Agreement.

Article 7
Monitoring and Evaluation

Monitoring and evaluation on the implementation of this Mutual Agreement is done by ALL THE PARTIES periodically, no less than once a year.

Article 8
Addendum / Amendment

(1) The things that are not regulated and/or not yet covered by the Mutual Agreement will be determined on the basis of the consent of ALL THE PARTIES in the form of an *addendum* / amendment
(2) The *addendum* / amendment referred to in clause (1) is an integral part of the Mutual Agreement

Article 9
Closing

This Mutual Agreement is duplicated into 2 (two), each stamped and have the same legal effect after being signed by ALL THE PARTIES

Thus ALL THE PARTIES that have signed this Mutual Agreement on the day, date, month, and year at Jakarta as stated above are able to use this agreement as it is intended.

FIRST PARTY,	SECOND PARTY,
	
RUDIANTARA	ANDI EKA SAKYA

Article 8
Addendum / Amendment

(1) The things that are not regulated and/or not yet covered by the Mutual Agreement will be determined on the basis of the consent of ALL THE PARTIES in the form of an *addendum* / amendment
(2) The *Addendum* / amendment referred to in clause (1) is an integral part of the Mutual Agreement

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FIRST PARTY,	SECOND PARTY,
	
RUDIANTARA	ANDI EKA SAKYA

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FIRST PARTY,	SECOND PARTY,
RUDIANTARA	ANDLEKA SAKYA

Appendix 6-2

Cooperation Agreement

between KOMINFO and BMKG

COOPERATION AGREEMENT

BETWEEN

THE GENERAL DIRECTORATE OF PROVIDING POST AND INFORMATICS,
THE MINISTRY OF COMMUNICATIONS AND INFORMATICS,

AND

THE AGENCY FOR METROLOGICAL, CLIMATOLOGICAL, AND GEOPHYSICS

NUMBER: 826/KOMINFO/DJPPI/HK.03/05/205
NUMBER: KS.301/011/SU/V/2015

ABOUT

THE UTILIZATION OF TELECOMMUNICATION SYSTEMS IN PROVIDING EARLY WARNINGS IN OCCASIONS OF EXTREME WEATHER CONDITIONS, EXTREME CLIMATES, TSUNAMI, AND EARTH QUAKES

On this day, Tuesday, the twelfth of day of the month of May, the year of two thousand fifteen, held in Jakarta, the participants who signed are as follows:

1. Kalamullah Ramli	:	The General Directorate of Providing Post and Informatics, in this matter will act for and on the name of the Ministry of Communication and Informatics, whose office is located at Jalan Medan Merdeka Barat Nomor 9, Jakarta Pusat 10110, and will hereinafter be referred to as the FIRST PARTY
2. Masturyono	:	The Task Executor of the Main Secretary of the Agency for Meteorology, Climatology, and Geophysics, in this matter will act for and on the name of the Agency for Meteorology Climatology, and Geophysics, whose office is located at Jalan Angkasa I, Nomor 2, Kemayoran, Jakarta Pusat 10720, and will hereinafter be referred to as the SECOND PARTY.

The FIRST PARTY and the SECOND PARTY, from hereinafter will together be referred to as ALL THE PARTIES, based on the Mutual Agreement between the Ministry of Communication and Informatics and Agency for Meteorology, Climatology, and Geophysics Number 399 Year 2015 and Number KS.301 / 010 / KB / V / 2015 on the Utilization of Information Technology and Communication in Providing Information concerning Meteorology, Climatology, and Geophysics, has agreed to have themselves bound to make, sign, and execute the Cooperation Agreement on the utilization of Telecommunication Systems in Providing Early Warnings in occasions of Extreme Weather Conditions, Extreme Climates, Tsunami, and Earth Quakes, with the following conditions:

Article 1
General Requirements

In this Mutual Agreement, what is meant by:

1. Information Technology and Communications are any activities that are related with the processing, manipulation, management, and moving information between different media forms.
2. Telecommunication is the transmitting and receiving of information in the medium of signs, signals, writing, images, sounds, and sounds being transmitted through cable, optical, radio or other electromagnetic systems.
3. Telecommunications operator is the telecommunications operator whose properties, designations, and operations are particular;
4. Meteorology is natural symptoms associated with the weather.
5. Climatology is natural symptoms associated with climates and air quality.
6. Geophysics are natural symptoms associated with earth quakes, tectonic plates, tsunamis, gravity, earth’s gravitation, electrical air, and signs according to time.
7. Telecommunication network provider is the provision and or service of telecommunication networks that enable the implementation of telecommunication.
8. Extreme weather are meteorological phenomena that are considered extreme over the course of history (distributed), particularly weather phenomena that have the potentials of causing disasters, destroying the fabric of social life, or causing human casualties.
9. Early warnings of extreme weather are a series of activities to disseminate information to the public as soon as possible concerning the predictions of the possibility of extreme weather conditions.

10. Early warnings of extreme climates are the series of activities to disseminate information to the public as soon as possible concerning the predictions of the possibility of extreme climate conditions.
11. Early warnings of tsunami is the combination of technological abilities and public abilities to avoid the result of the early warnings of the sea waves that propagate in all directions and occurs because of a impulsive disturbance on the seabed.

Article 2
Goals

The goal of this Cooperation Agreement is to build team work and communication in the execution of the ALL THE PARTIES program to achieve the utilization of the telecommunication systems to spread information of early warnings of extreme weather, extreme climates, tsunami, and information on earth quakes to support the coordination of the implementation of disaster management activities in a planned, integrated and comprehensive way through the implementation of communication and informatics.

Article 3
Scope

The scope of this Cooperation Agreement includes:
a. providing data and early warning information systems on extreme weather, extreme climates, tsunami, and earthquake information;
b. providing an information system telecommunication device that spreads early warnings on extreme weather, extreme climates, tsunami, and earthquake information;
c. mentoring and development of human resources;
d. providing facilities and infrastructures to support telecommunication to spread information from an early warnings system on extreme weather, extreme climates, tsunami, and earthquake information;
e. providing a means of access to the operator of telecommunication network and broadcasting, and internet service providers to spread information on an early warnings system on extreme weather, extreme climates, tsunami, and earth quake information to the public that potentially could be affected by a natural disaster; and
f. utilization of information access and technology for the needs of spreading information from an early warning system on extreme weather, extreme climates, tsunami, and earthquake information.

Article 4
Duties and Responsibilities

(1) The FIRST PARTY has duties and responsibilities as follows:
   a. provide, install, and maintain telecommunication device in the event of spreading information from an early warning system on extreme weather, extreme climates, tsunami, and earth quake information;
   b. connecting telecommunication systems in the event of spreading information on the early warning on extreme weather, extreme climates, tsunami, and earthquake information to the SECOND PARTY;
   c. giving technical training to the human resources that are in charge of the telecommunication system in the event of spreading information on the early warning on extreme weather, extreme climates, tsunami, and earthquake information to the SECOND PARTY;
   d. giving supervision and monitoring to the operating of the telecommunication system in the event of spreading information on the early warning on extreme weather, extreme climates, tsunami, and earth quake information to the SECOND PARTY;
   e. providing and opening telecommunication access that connects the information center of the FIRST PARTY to the information center of the SECOND PARTY; and
   f. providing access from the central information of the FIRST PARTY to the telecommunication operators and broadcaster, and Internet service providers to spread information on the early warning on extreme weather, extreme climates, tsunami, and earthquake information to the public that potentially could be affected by a natural disaster.

(2) The SECOND PARTY has duties and responsibilities as follows:
   a. provide information from an early warning system on extreme weather, extreme climates, tsunami, and earthquake information that have already been analyzed by the SECOND PARTY;
   b. giving input on the technical specification and information access to the FIRST PARTY;
   c. providing human resources and operating telecommunication devices that have been provided by the FIRST PARTY;
   d. providing and opening data access and information on the early warning system on extreme weather, extreme climates, tsunami, and earth quake information from the information center of the SECOND PARTY to the information center of the FIRST PARTY;

e. giving understanding to the FIRST PARTY on the information on the early warning of extreme weather, extreme climates, tsunami, and earth quake information.

Article 5
Implementation Mechanism

The implementation and deployment of the spreading of information of warning early warnings on extreme weather, extreme climates, tsunami, and earth quake information is executed according to the standard operating procedures that are determined by ALL THE PARTIES.

Article 6
Time Period

(1) This Cooperation Agreement is valid for a period of 5 (five) years starting from the date signed, and can be extended as required by agreement of ALL THE PARTIES;
(2) ALL THE PARTIES may propose an extension or termination of this Cooperation Agreement no later than 3 (three) months before the expiration of this Cooperation Agreement.
(3) Extension of the time and/or termination of the Cooperation Agreement as referred to in paragraph (2) can be implemented after written consent of ALL THE PARTIES.
(4) In the case where the Cooperation Agreement ends before the term expires, the termination of the collaboration agreement will not affect the rights and obligations of ALL THE PARTIES that must be completed before the expiration of this agreement.

Article 7
Financing

All costs incurred with respect to the implementation of the collaboration agreement is charged to the budget and expenditures of ALL THE PARTIES in accordance with the capacity and authority as well as the provision of statutory regulations.

Article 8
Unavoidable Occurrence (*Force Majeure*)

(1) What is meant by force majeure are circumstances that are beyond the control of one or ALL OF THE PARTIES that lead to the PARTY involved not being able to implement this collaboration agreement, namely:
   a. major earthquakes, hurricanes, typhoons, major fire accident, major flood, landslide, and epidemic of disease; and
   b. general strike, riot, rebellion, war, and other circumstances that official authorities declared a force majeure.

(2) In the event of an unavoidable occurrence as declared on paragraph (1), then the parties involved are obliged to give a written report to the other parties within a time period of 14 (fourteen) days since the day the event occurred, as well as at the end of a force majeure, which is accompanied by evidence of the parties or the competent authority.

(3) Negligence or delay by a party under force majeure to comply with the obligation to notify as referred to in paragraph (2), will result in non-recognition of the events referred to in paragraph (1) as force majeure.

(4) All losses incurred or suffered by any of the parties due to the occurrence of force majeure is not the responsibility of the other party.

(5) Other than the circumstances of force majeure as referred to in paragraph (1), in the event where the Government's policy in the field of economy and monetary, and other policies of the Government both central and local levels, greatly affect the implementation of the Collaboration Agreement, ALL THE PARTIES may establish specific policies.

Article 9
Dispute Resolution

In the case of disagreement or dispute in the implementation and / or interpretation of this collaboration agreement, ALL THE PARTIES will resolve the disagreement or dispute through deliberation.

Article 10
Amendment

(1) This Collaboration Agreement may be amended by agreement of the ALL THE PARTIES

(2) Changes and/or things that have not been regulated in this Collaboration Agreement as referred to in paragraph (1) shall be in the form of an ***addendum*** and/or amendments agreed upon by ALL THE PARTIES and constitute an integral part of this Collaboration Agreement.

Article 11
Notification / Communication

Any notification / communication between ALL THE PARTIES in the implementation of the Collaboration Agreement can be submitted in the form of a written letter and deemed to have been accepted if submitted directly or by registered mail and accompanied by the receipt or facsimile or electronic mail to the following address:

FIRST PARTY
Director of Telecommunications, Public Broadcasting and Universal Obligation, the General Directorate of Post and Informatics
The Ministry of Communications and Information, Jalan Medan Merdeka Barat Nomor 9, Jakarta Pusat 10110.
Phone : (021) 34830708
Fax : (021) 34830708

SECOND PARTY
Technical Related:
Head of Public Meteorology
Council of Meteorology, Climatology, and Geophysics, Jalan Angkasa I Nomor 2, Kemayoran, Jakarta Pusat 10720.
Phone : (021) 6544701
Fax : (021) 6546314

Central Head of Climates of Agroclimate and Maritime
Council of Meteorology, Climatology, and Geophysics, Jalan Angkasa I Nomor 2 Kemayoran, Jakart Pusat 10720.
Phone : (021) 4244710
Fax : (021) 4244710

Network and Telecommunication Related:
Head of Communication Networks
Council of Meteorology, Climatology, and Geophysics, Jalan Angkasa I Nomor 2, Kemayoran, Jakarta Pusat 10720.
Phone : (021) 6546340
Fax : (021) 6546340

Administration Related:
Head of Legal Bureau and Organization
Council of Meteorology, Climatology, and Geophysics, Jalan Angkasa I Nomor 2, Kemayoran, Jakarta Pusat 10720.
Phone : (021) 65866229
Fax : (021) 6546339
Email : biro.hukum@bmkg.go.id

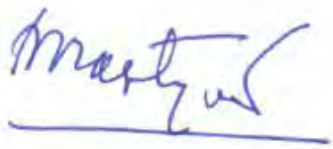
Article 12
Others

ALL THE PARTIES are not responsible for the delay and incompleteness of early warning information on extreme weather, extreme climates, tsunami, and earthquake information that has been presented to the public as a result of the occurrence of errors / disruption of telecommunication device caused by factors beyond the capabilities of ALL THE PARTIES.

Article 13
Closing

This Collaboration Agreement, made and signed on the day, date, month, and year as stated on the beginning of this Collaboration Agreement, is duplicated into 2 (two), each stamped and have the same legal effect after being signed by ALL THE PARTIES

Thus cooperation agreement is made to be obeyed and implemented by ALL THE PARTIES.

FIRST PARTY,	SECOND PARTY,
	
KALAMULLAH RAMLI	MASTURYONO

Article 13
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This Collaboration Agreement, made and signed on the day, date, month, and year as stated on the beginning of this Collaboration Agreement, is duplicated into 2 (two), each stamped and have the same legal effect after being signed by ALL THE PARTIES

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FIRST PARTY,	SECOND PARTY,
KALAMULLAH RAMLI	MASTURYONO

Appendix 6-3

Memorandum of Understanding

between KOMINFO and BNPB

BNPB

KOMINFO

NOTA KESEPAHAMAN

ANTARA

BADAN NASIONAL PENANGGULANGAN BENCANA

DENGAN

KEMENTERIAN KOMUNIKASI DAN INFORMATIKA

NOMOR : MoU 10/BNPB/6/2012

NOMOR : 351/M.KOMINFO/6/2012

TENTANG

PEMANFAATAN PENYELENGGARAAN KOMUNIKASI DAN INFORMATIKA DI BIDANG PENANGGULANGAN BENCANA

Pada hari ini Senin, tanggal Sebelas, bulan Juni tahun Dua Ribu Dua Belas, bertempat di Jakarta, yang bertandatangan di bawah ini:

1. **SYAMSUL MAARIF**, Kepala Badan Nasional Penanggulangan Bencana, dalam hal ini bertindak untuk dan atas nama Badan Nasional Penanggulangan Bencana, berkedudukan di Jalan Ir. H. Djuanda Nomor 36, Jakarta Pusat 10120, selanjutnya disebut sebagai **PIHAK KESATU**.
2. **TIFATUL SEMBIRING,** Menteri Komunikasi dan Informatika Republik Indonesia, dalam hal ini bertindak untuk dan atas nama Kementerian Komunikasi dan Informatika Republik Indonesia, berkedudukan di Jalan Medan Merdeka Barat Nomor 9, Jakarta Pusat 10110, selanjutnya disebut sebagai **PIHAK KEDUA.**

PIHAK KESATU dan **PIHAK KEDUA** secara bersama-sama disebut **PARA PIHAK,** terlebih dahulu menerangkan hal-hal sebagai berikut:

a. bahwa **PIHAK KESATU** adalah instansi yang berwenang dan bertanggung jawab dalam perumusan, penetapan kebijakan dan pengkoordinasian pelaksanaan kegiatan penanggulangan bencana;

b. bahwa **PIHAK KEDUA** adalah instansi yang berwenang dan bertanggung jawab dalam perumusan, penetapan kebijakan di bidang komunikasi dan informatika; dan

c. bahwa pemanfaatan penyelenggaraan komunikasi dan informasi di bidang penanggulangan bencana yang baik merupakan faktor penting dalam mendukung pengkoordinasian pelaksanaan kegiatan penanggulangan bencana secara terencana, terpadu dan menyeluruh.

Berdasarkan pertimbangan tersebut, **PARA PIHAK** sepakat untuk melaksanakan Nota Kesepahaman tentang Pemanfaatan Penyelenggaraan Komunikasi dan Informatika di Bidang Penanggulangan Bencana dengan ketentuan sebagai berikut:

TUJUAN

Pasal 1

Tujuan Nota Kesepahaman ini yaitu membangun kerjasama dan komunikasi dalam pelaksanaan program **PARA PIHAK** untuk mewujudkan percepatan penyampaian informasi di bidang penanggulangan bencana guna mendukung koordinasi pelaksanaan kegiatan penanggulangan bencana secara terencana, terpadu dan menyeluruh melalui penyelenggaraan komunikasi dan informatika.

LINGKUP KERJASAMA

Pasal 2

Ruang Lingkup Nota Kesepahaman ini meliputi:

a. pelaksanaan edukasi publik dan diseminasi informasi di bidang penanggulangan bencana;

b. pengembangan Kelompok Informasi Masyarakat (KIM) peduli bencana;

c. pengembangan sumber daya manusia bidang teknologi informasi dan komunikasi dalam penanggulangan bencana;

d. pengembangan konten informasi edukatif di bidang penanggulangan bencana;

e. pemberdayaan dan pemanfaatan aplikasi informatika di bidang penanggulangan bencana; dan

f. pemanfaatan sarana dan prasarana komunikasi dan informatika di bidang penanggulangan bencana.

PELAKSANAAN

Pasal 3

(1) Pelaksanaan Nota Kesepahaman ini akan diatur lebih lanjut dalam suatu Perjanjian Kerja Sama tersendiri yang mengatur rincian pekerjaan, mekanisme pekerjaan, hak dan kewajiban, tugas dan tanggung jawab, dan hal-hal lain yang dipandang perlu.

(2) Untuk melaksanakan Perjanjian Kerja Sama sebagaimana dimaksud pada ayat (1), **PARA PIHAK** akan menunjuk wakilnya sesuai dengan kebutuhan, tugas, dan fungsinya;

(3) Perjanjian Kerja Sama sebagaimana dimaksud pada ayat (1) merupakan satu kesatuan yang tidak dapat dipisahkan dari Nota Kesepahaman ini.

TUGAS DAN TANGGUNG JAWAB

PASAL 4

PARA PIHAK bertanggung jawab melaksanakan segala hal yang berkaitan dengan tujuan dan ruang lingkup dalam Nota Kesepahaman ini dan sesuai dengan ketentuan peraturan perundang-undangan.

JANGKA WAKTU

Pasal 5

(1) Nota Kesepahaman ini berlaku untuk jangka waktu 5 (lima) tahun terhitung sejak tanggal ditandatangani, dan dapat diperpanjang sesuai dengan kebutuhan berdasarkan kesepakatan **PARA PIHAK**;

(2) **PARA PIHAK** dapat melakukan usulan perpanjangan Nota Kesepahaman ini secara tertulis paling lama 6 (enam) bulan sebelum berakhirnya Nota Kesepahaman ini;

(3) Dalam hal salah satu pihak berkeinginan untuk mengakhiri Nota Kesepahaman ini sebelum jangka waktu sebagaimana dimaksud pada ayat (1), maka pihak yang bermaksud mengakhiri Nota Kesepahaman ini wajib memberitahukan maksud tersebut secara tertulis kepada pihak lainnya paling lama 3 (tiga) bulan sebelum tanggal yang diinginkan untuk diakhirinya Nota Kesepahaman ini.

(4) Perpanjangan dan/atau Penghentian Nota Kesepahaman sebagaimana dimaksud pada ayat (2) dan ayat (3) dapat dilaksanakan setelah persetujuan tertulis **PARA PIHAK**.

(5) Dalam hal Nota Kesepahaman ini berakhir sebelum jangka waktunya berakhir, maka pengakhiran Nota Kesepahaman tidak akan mempengaruhi hak dan kewajiban **PARA PIHAK** yang harus diselesaikan terlebih dahulu sebelum berakhirnya Nota Kesepahaman ini.

PEMBIAYAAN

Pasal 6

Segala biaya yang timbul berkenaan dengan Pelaksanaan Nota Kesepahaman ini dibebankan kepada Anggaran Pendapatan dan Belanja **PARA PIHAK** sesuai dengan kapasitas dan kewenangan serta ketentuan peraturan perundang-undangan.

PENYELESAIAN PERSELISIHAN

Pasal 7

Apabila terjadi perselisihan berkenaan dengan pelaksanaan Nota Kesepahaman ini, maka akan diselesaikan secara musyawarah dan mufakat oleh **PARA PIHAK**.

PERUBAHAN

Pasal 8

(1) Nota Kesepahaman ini dapat diubah berdasarkan persetujuan **PARA PIHAK**;

(2) Perubahan dan/atau hal-hal yang belum diatur dalam Nota Kesepahaman ini sebagaimana dimaksud pada ayat (1) diatur dalam bentuk addendum dan/atau amandemen yang merupakan bagian yang tidak terpisahkan dari Nota Kesepahaman ini.

LAIN-LAIN

Pasal 9

Pelaksanaan Nota Kesepahaman ini yang menyangkut kegiatan, pembiayaan, fasilitas, hak dan kewajiban serta hal-hal lain akan dijabarkan dan diatur lebih lanjut dalam Perjanjian Kerjasama tersendiri yang berpedoman pada Nota Kesepahaman ini.

PENUTUP

Pasal 10

Nota Kesepahaman ini dibuat dalam rangkap 2 (dua) asli, masing-masing sama bunyinya serta mempunyai kekuatan hukum yang sama setelah ditandatangani di atas materai yang cukup oleh PARA PIHAK.

Demikian PARA PIHAK telah menandatangani Nota Kesepahaman ini pada hari, tanggal, bulan dan tahun di Jakarta seperti yang telah disebutkan diatas untuk dapat digunakan sebagaimana mestinya.

PIHAK KESATU,	PIHAK KEDUA,
SYAMSUL MAARIF	TIFATUL SEMBIRING

Appendix 6-4

Terms of Reference of DMIS

KAK (KERANGKA ACUAN KERJA)

KELUARAN KEGIATAN

PENCAPAIAN INTEGRASI SISTEM INFORMASI KEBENCANAAN

Kementerian Negara/Lembaga	:	Kementerian Komunikasi dan Informatika
Unit Eselon I	:	Direktorat Jenderal Penyelenggaraan Pos dan Informatika
Program	:	Penyelenggaraan Pos dan Informatika
Hasil	:	% Wilayah Indonesia Yang Terjangkau Layanan Integrasi Sistem Informasi Kebencanaan
Unit Eselon II/Satker	:	Direktorat Telekomunikasi Khusus, Penyiaran Publik dan Kewajiban Universal
Kegiatan	:	Pembinaan dan Pengembangan Penyelenggaraan Telekomunikasi Khusus, Penyiaran Publik dan Kewajiban Universal
Indikator Kinerja Kegiatan	:	% Regulasi, Dokumen Sistem Informasi Kebencanaan Terintegrasi di Lingkungan Direktorat Telekomunikasi Khusus, Penyiaran Publik dan Kewajiban Universal
Satuan Ukur dan Jenis Keluaran	:	Dokumen
Volume	:	2

I. Latar Belakang

1. Dasar Hukum Tugas Fungsi/Kebijakan

a. Undang-undang RI No.36 Tahun 1999 tentang Telekomunikasi.
b. Undang-undang RI No.32 Tahun 2002 tentang Penyiaran.
c. Undang-undang RI No.17 Tahun 2003 tentang Keuangan Negara.
d. Undang-undang RI No.39 Tahun 2008 tentang Kementerian Negara.
e. Peraturan Pemerintah Republik Indonesia Nomor 11 Tahun 2005 Tentang Penyelenggaraan Penyiaran Lembaga Penyiaran Publik.

f. Peraturan Pemerintah Republik Indonesia Nomor 21 Tahun 2008 Tentang Penyelenggaraan Penanggulangan Bencana
g. Peraturan Presiden No.52 Tahun 2000 tentang Penyelenggaran Telekomunikasi.
h. Peraturan Presiden RI Nomor 54 Tahun 2010 tentang Pedoman Pelaksanaan dan Pengadaan Barang/Jasa Pemerintah.
i. Peraturan Presiden No.24 Tahun 2010 tentang Kedudukan, Tugas dan Fungsi Eselon I Kementerian Negara serta Susunan Organisasi, Tugas dan Fungsi Eselon I Kementerian Negara.
j. Keputusan Menteri No.20 Tahun 2001 tentang Penyelenggaraan Jaringan Telekomunikasi sebagaimana telah diubah dengan Keputusan Menteri Perhubungan No. KM 29 Tahun 2004 tentang Penyelenggaraan Jaringan Telekomunikasi.
k. Keputusan Menteri No.21 Tahun 2001 tentang Penyelenggaraan Jasa Telekomunikasi.
l. Peraturan Menteri Keuangan No. 84/PMK.02/2011 tentang Standar Biaya Tahun Anggaran 2013.

2. Gambaran Umum

Bencana alam merupakan peristiwa luar biasa yang dapat menimbulkan penderitaan luar biasa pula bagia yang mengalaminya. Bahkan, bencana alam tertentu menimbulkan banyak korban cedera maupun meninggal dunia. Bencana alam juga tidak hanya menimbulkan banyak luka atau cedera fisik, tetapi juga menimbulkan dampak psikologis atau kejiwaan. Hilangnya harta benda dan nyawa orang akan membuat sebagian korban bencana alam mengalami stress atau gangguan kejiwaan.

Mengingat dampak yang luar biasa tersebut, maka penanggulangan bencana alam harus dilakukan dengan menggunakan prinsip dan cara yang tepat. Selain itu, penanggulangan bencana alam juga harus menyeluruh tidak hanya pada saat terjadi bencana tetapi pencegahan sebelum terjadi bencana dan rehabilitasi serta rekonstruksi setelah terjadi bencana. Hal ini dilakukan dengan tujuan agar bencana alam tidak terlalu banyak menimbulkan dampak buruk bagi korban bencana alam.

Penanggulangan bencana alam adalah upaya kegiatan yang dilakukan meliputi pencegahan, mitigasi, penyelamatan, rehabilitasi, dan rekonstruksi, baik sebelum, pada saat maupun setelah setelah bencana dan menghindarkan dari bencana yang terjadi. Penanggulangan bencana alam bertujuan untuk melindungi masyarakat bencana alam dan dampak yang ditimbulkannya. Karena itu, dalam penanggulangannya harus memperhatikan prinsip-prinsip penanggulangan bencana alam. Prinsip pelaksanaan penanggulangan bencana harus mendapat prioritas dan mengutamakan pada kegiatan penyelamatan jiwa manusia dan dilaksanakan secara cepat dan tepat sesuai dengan tuntutan keadaan. Keterlambatan dalam penanggulangan akan berdampak pada tingginya kerugian material maupun korban jiwa.

Wilayah Indonesia termasuk banyak memiliki daerah yang rawan terhadap bencana alam di dunia bahkan di beberapa daerah telah terjadi bencana alam. Sebagai tanggung jawab sosial kepada masyarakat dalam bentuk ketersediaan layanan dan jaringan komunikasi di daerah rawan bencana, perangkat telekomunikasi khusus tentunya dapat dijadikan alat komunikasi yang dapat memberikan informasi cepat tanggap darurat kepada masyarakat untuk melakukan antisipasi kerugian akibat situasi bencana alam yang dapat terjadi sewaktu-waktu.

Pelaksanaan penanggulangan bencana alam didasarkan pada koordinasi yang baik dan saling mendukung. Peralatan telekomunikasi khusus dioperasikan untuk mendukung penanggulangan bencana alam dan dibutuhkan koordinasi dari pihak atau lembaga terkait kebencanaan di Indonesia. Kementerian Komunikasi dan Informatika sebagai katalisator informasi bencana yang berasal dari lembaga peringatan dini dan dikirim langsung ke masyarakat berdampak bencana melalui lembaga penyampai informasi.

Pelaksanaan teknis implementasi penanggulangan bencana harus memiliki dasar hukum yang kuat. Regulasi yang disusun dengan melihat kondisi penanggulangan bencana alam pada saat ini dan penanggulangan bencana alam ke depannya. Regulasi ini mencakup pelaksanaan teknis implementasi

sistem diseminasi informasi bencana dan mengatur koordinasi antar lembaga untuk mencapai penanggulangan bencana yang cepat dan tepat sasaran.

Dalam merumuskan regulasi teknis tersebut diperlukan tenaga ahli untuk mendampingi menyusun rancangan peraturan menteri. Tenaga ahli tersebut jugat dapat merumuskan regulasi teknis implementasi serta koordinasi antar lemabag mengenai draft rancangan peraturan menteri

Dalam pelaksanaan penanggulangan bencana harus dilakukan persiapan implementasi integrasi sistem. Persiapan implementasi adalah membangun pusat data untuk diseminasi informasi. Pusat data tersebut akan dikelola oleh Kementerian Komunikasi dan Informatika. Setelah membangun pusat data center, langkah selanjutnya membentuk koordinasi yang kuat dalam penanggulangan bencana di Indonesia.

Oleh karena itu, memandang perlu untuk membangun pusat data center dan menyusun peta peran lembaga yang terkait kebencanaan untuk melakukan koordinasi yang bagus dan baik dalam penanggulangan bencana alam di Indonesia. Peta peran memiliki peranan penting untuk penanggulangan bencana. Peta peran ini bertujuan bahwa lembaga-lembaga tersebut tidak tumpang tindih dalam tugas pokok dan fungsi masing-masing lembaga.

3. **Keterkaitan Program dan Kegiatan**

   Kegiatan Pencapaian Integrasi Sistem Informasi Kebencanaan terdiri atas beberapa program diantaranya :

   a. Penyusunan Regulasi Teknis Implementasi Penanggulangan Bencana;
   b. Persiapan Implementasi Integrasi Sistem Informasi Diseminasi Kebencanaan.

II. Kegiatan yang dilaksanakan

A. Uraian kegiatan dan keluaran

1) Penyusunan Regulasi Teknis Implementasi Penanggulangan Bencana

   a. Membentuk tim perancang regulasi;
   b. Koordinasi dengan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, pemadam kebakaran, operator telekomunikasi, lembaga penyiaran, dll;

c. Mengundang narasumber ahli dalam bidang telekomunikasi, sistem informasi, hukum dan manajemen sistem informasi;
d. Mengadakan rapat koordinasi;
e. Membuat evaluasi dan pelaporan.

2) Persiapan Implementasi Integrasi Sistem Informasi Diseminasi Kebencanaan
a. Membentuk tim kolaborasi dengan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, pemadam kebakaran, operator telekomunikasi, lembaga penyiaran, dll;
b. Merekrut ahli-ahli dalam bidang telekomunikasi, sistem informasi, hukum, manajemen sistem informasi dan kebencanaan;
c. Mengadakan rapat koordinasi dalam rangka persiapan implementasi sistem informasi diseminasi kebencanaan;
d. Membuat evaluasi dan pelaporan.

B. Indikator Kinerja

Tersusunnya regulasi & terbangunnya integrasi sistem informasi kebencanaan.

C. Batasan Kegiatan

Kegiatan pembuatan dokumen pencapaian integrasi sistem informasi kebencanaan adalah kegiatan yang dilakukan oleh Direktorat Telekomunikasi Khusus PPKU dengan melibatkan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, pemadam kebakaran, operator telekomunikasi, lembaga penyiaran, dll yang bertujuan untuk membuat sistem informasi terintegrasi guna menginformasikan kejadian bencana di Indonesia secara cepat, efektif dan efisien. Kegiatan ini dilakukan dengan batasan :

1) Rapat-rapat dengan tenaga ahli;
2) Melakukan focus group discussion (FGD) untuk mendapat masukan dari narasumber;
3) Pembuatan laporan : pendahuluan, interim/kemajuan, draft laporan akhir, laporan akhir.

D. Maksud, Tujuan dan Sasaran

1) Maksud Kegiatan

Menyusun regulasi teknis implementasi sistem informasi penanggulangan bencana yang cepat dan tepat, serta membangun sistem informasi diseminasi kebencanaan dalam penanggulangan bencana alam di Indonesia.

2) Tujuan Kegiatan

a. Memberikan panduan untuk pengoperasian sistem diseminasi informasi yang sudah terintegrasi dengan sistem lembaga-lembaga yang terkait bencana.

b. Memberikan arah pelaksanaan penanggulangan bencana alam kepada lembaga-lembaga terkait bencana alam di Indonesia.

c. Memberikan rekomendasi dalam hal regulasi pengoperasian perangkat dan koordinasi antar lembaga-lembaga terkait bencana alam di Indonesia.

3) Sasaran Kegiatan

Menciptakan aplikasi sistem informasi kebencanaan yang dapat membantu kehidupan masyarakat dalam hal penanganan kebencanaan lebih dini sehingga dengan adanya aplikasi ini diharapkan dapat meningkatkan tingkat keselamatan jika terjadi bencana.

III. Indikator Keluaran, Volume dan Satuan Ukur

1) Indikator Kegiatan

Dalam kegiatan ini, keluaran yang diharapkan dalam kegiatan ini adalah tersusunnya aplikasi sistem informasi kebencanaan yang memungkinkan penanganan bencana lebih dini yang pada akhirnya dapat meningkatkan tingkat keselamatan jika terjadi bencana.

2) Volume dan Satuan Ukur

Sebanyak 2 (Dua) Dokumen yaitu dokumen sistem informasi kebencanaan dan dokumen regulasi teknis implementasi penanggulangan bencana.

IV. Cara PelaksanaanKegiatan

1) Metode Pelaksanaan

Metode Pelaksanan berupa swakelola dan pihak ke-3.

Rencana konfigurasi sistem informasi kebencanaan yang akan dibangun adalah seperti di bawah ini :

a. Diagram Konfigurasi Dissemination Disaster Center Level 0

Pada diagram konfigurasi ini menjelaskan keterhubungan antara dissemination disaster center. Acuan dalam perancangan arsitektur/ konfigurasi sistem bencana alam adalah sesuai informasi yang diberikan BMKG dan juga institusi terkait dengan mempertimbangkan efisiensi jaringan yang diterapkan di Amerika. Kelebihan dengan metode ini adalah :

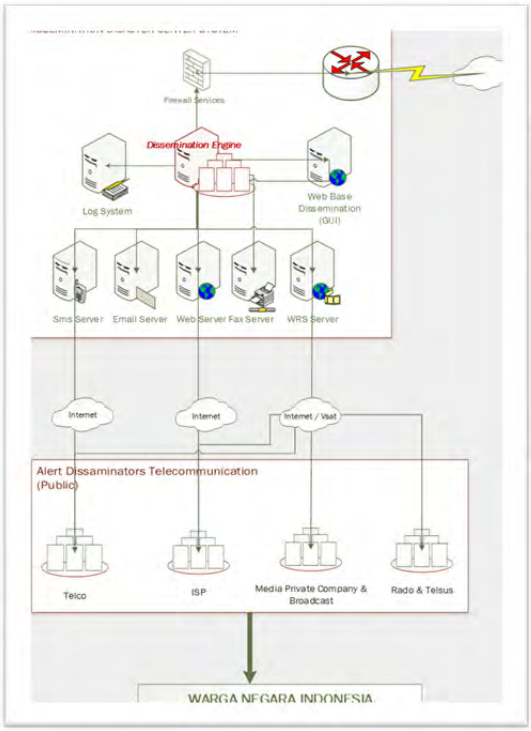
1. Peningkatan efisiensi jaringan
2. Peningkatan efektifitas dan simplifikasi dalam pengiriman informasi Menggunakan protocol CAP (Common Alert Protocol) untuk pertukaran peringatan darurat public antar teknologi alerting

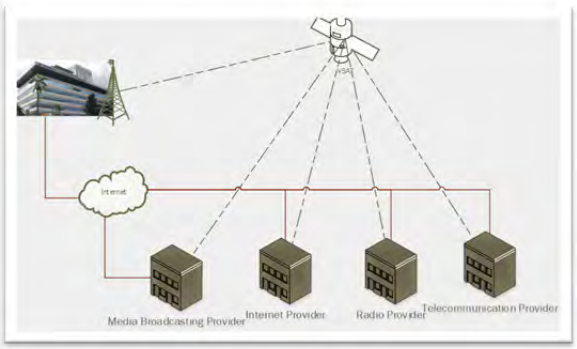
b. Diagram Konfigurasi Dissemination Disaster Center Level 1

Pada diagram konfigurasi ini menjelaskan sistem yang ada pada dissemination disaster center. Terdapat empat jenis format pesan peringatan tsunami, yaitu

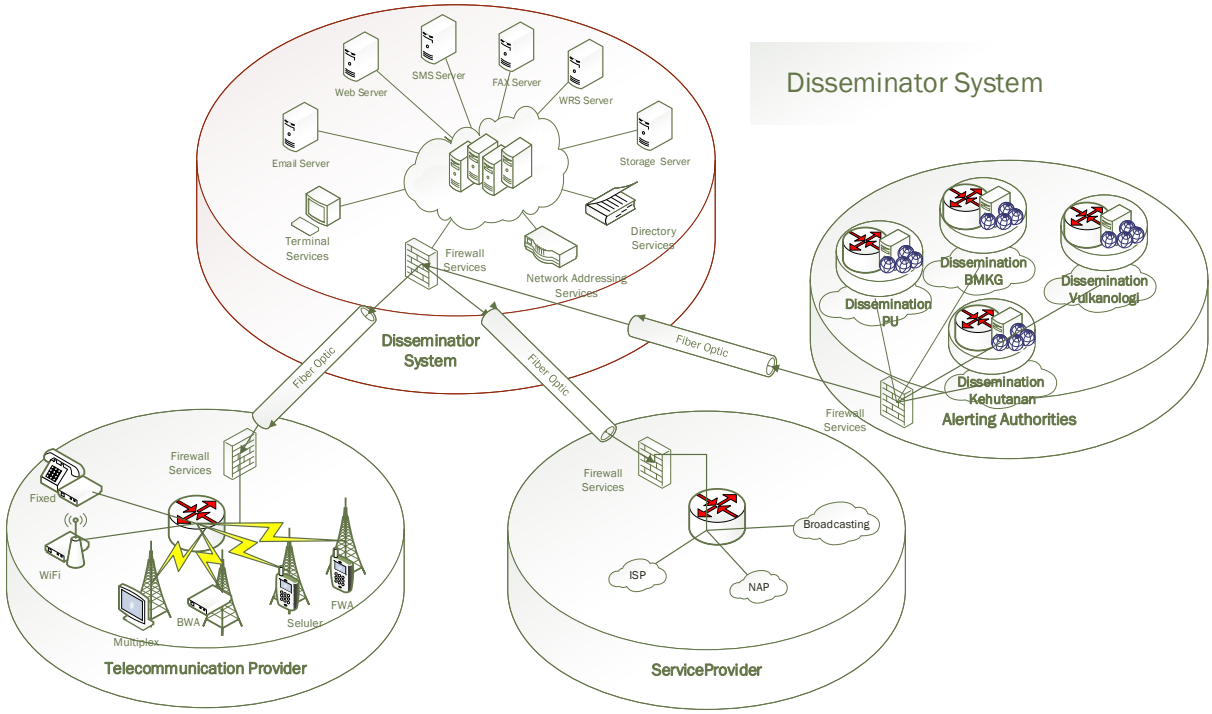
1. Format teks pendek (SMS),
2. Format teks panjang (faks, email, dan GTS),
3. Format WRS untuk lembaga perantara dan media,
4. Serta format *website.*

c. Konfigurasi Global Allert Disaminator





d. Konfigurasi Jaringan Dissaminator IP



2) Tahapan Kegiatan

1) Penyusunan regulasi teknis implementasi penanggulangan bencana

a. Membentuk tim;

b. Koordinasi dengan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, operator telekomuniaksi, lembaga penyiaran, dll;
c. Mengundang narasumber yang ahli dalam bidang telekomuniaksi, sistem informasi, hukum dan kebencanaan;
d. Mengadakan rapat dan merancang draft regulasi;
e. Melakukan evaluasi dan pelaporan.

2) Persiapan implementasi integrasi sistem informasi diseminasi kebencanaan
a. Membentuk tim;
b. Koordinasi dengan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, operator telekomuniaksi, lembaga penyiaran, dll;
c. Mengundang narasumber yang ahli dalam bidang telekomuniaksi, sistem informasi, hukum dan kebencanaan;
d. Mengadakan rapat dan merancang implementasi integrasi sistem informasi kebencanaan;
    1. Melakukan identifikasi dan analisa terhadap perangkat penanggulangan bencana;
    2. Melakukan identifikasi dan analisa terhadap peranan masing lembaga-lembaga dalam penanggulangan bencana;
    3. Membangun sistem informasi diseminasi kebencanaan;
    4. Menyusun panduan manual sistem informasi;
e. Melakukan evaluasi dan pelaporan.

Adapun kompetensi tenaga ahli yang dibutuhkan untuk penyusunan integrasi sistem informasi kebencanaan ini antara lain sebagai berikut :

Uraian	**Tenaga ahli**	**Durasi (Bulan)**	**Jumlah (orang)**
Membuat draft rancangan regulasi integrasi sistem	**Ahli Hukum Telekomunikasi**	4	1

informasi kebencanaan			
Selaku ketua tim merangkap tenaga ahli teknologi informatika	**Project Manager**	4	1
Melakukan kajian teknis tentang infrastruktur industri telekomunikasi	**AhliJasa telekomunikasi**	4	1
Melakukan kajian teknis tentang infrastruktur Jaringan telekomunikasi untuk keperluan khusus	**Ahli Jaringan Telekomunikasi**	4	1

V. Tempat Pelaksanaan

Pelaksanaan Kegiatan dilakukan di Jakarta, koordinasi dilakukan di kota-kota besar di Indonesia seperti Bandung, Bali, Padang, dll.

VI. Pelaksanaan dan Penanggung Jawab dan Penerima Manfaat

1) Pelaksanaan diharapkan dapat berjalan sesuai dengan jadwal yang telah disusun, adapun perubahannya disesuaikan dengan situasi dan kondisi Direktorat. Pelaksana kegiatan merupakan pelaksana pada Subdirektorat Telekomuniaksi Khusus Non Pemerintah, Direktorat Telekomunikasi Khusus PPKU, Direktorat Jenderal PPI, Kementerian Komunikasi dan Informatika, dan instansi luar yang terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, operator telekomunikasi, lembaga penyiaran, dll.
2) Penanggung Jawab dari kegiatan adalah Kasubdit Telekomunikasi Khusus Non Pemerintah, Direktorat Telekomunikasi Khusus, Penyiaran Publik dan Kewajiban Universal.
3) Penerima Manfaat manfaat yaitu Dit Telsus PPKU, instansi-instansi terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, operator telekomunikasi, badan usaha swasta, serta masyarakat.

VII. Jadwal Kegiatan

1) Waktu Pelaksanaan Kegiatan
   a. Penyusunan regulasi teknis implementasi penanggulangan bencana
      Akan dilaksanakan pada bulan Februari sampai dengan Oktober 2015.
   b. Persiapan implementasi integrasi sistem informasi diseminasi kebencanaan
      Akan dilaksanakan pada bulan Februari sampai dengan Desember 2015.
2) Jadwal Kegiatan

NO	URAIAN KEGIATAN	BULAN											
		1	2	3	4	5	6	7	8	9	10	11	12
1.	**Penyusunan regulasi teknis implementasi penanggulangan bencana**												
	Membentuk tim;												
	Koordinasi dengan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, operator telekomuniaksi, lembaga penyiaran, dll;												
	Mengundang narasumber yang ahli dalam bidang telekomuniaksi, sistem informasi, hukum dan kebencanaan;												
	Mengadakan rapat dan merancang draft regulasi;												
	Melakukan evaluasi dan pelaporan.												

NO	URAIAN KEGIATAN	BULAN											
		1	2	3	4	5	6	7	8	9	10	11	12
2.	**Persiapan implementasi integrasi sistem informasi diseminasi kebencanaan**												
	Membentuk tim;												
	Mengundang narasumber yang ahli dalam bidang telekomuniaksi, sistem informasi, hukum dan kebencanaan;												
	Koordinasi dengan pihak-pihak terkait seperti BNPB, BMKG, Vulkanologi, BASARNAS, TNI/Polri, operator telekomuniaksi, lembaga penyiaran, dll;												
	Mengadakan rapat dan merancang implementasi integrasi sistem informasi kebencanaan;												
	Melakukan evaluasi dan pelaporan.												

VIII. Biaya yang diperlukan

Biaya pelaksanaan kegiatan penyusunan regulasi teknis implementasi penanggulangan bencana tahun 2015 adalah sebesar Rp.627.900.000,- (Enam ratus dua puluh tujuh juta sembilan ratus ribu rupiah), dan biaya pelaksanaan

kegiatan persiapan implementasi integrasi sistem informasi diseminasi kebencanaan adalah sebesar 5.000.000.000,- (Lima miliar rupiah). (Terlampir)

Jakarta, Maret 2015

Kasubdit Telekomunikasi Khusus Non Pemerintah, Direktorat Telekomunikasi Khusus, Penyiaran Publik dan Kewajiban Universal

Harapan Takaryawan

Appendix 7

References

Appendix 7-1

Collected Data List

No.	Item	Configuration	Original/ Copy	Issuing Institution	Year
1	Telecommuniation Law 1997	Electric File	Copy	KOMINFO	1997
2	Disaster Management Law 2007	Electric File	Copy	BNPB	2007
3	Standard operation Procedure for reporting Disaster	Electric File	Copy	BPBD	2008
4	Standard operation Procedure for Disaster Management of PUSDALOP PB	Electric File	Copy	BPBD West Sumatra	2008
5	Disaster Management Plan West Sumatra, 2008-2012	Electric File	Copy	BPBD West Sumatra	2009
6	The Strategic Plan Ministry Of Communication And Informatics Year 2009-2014	Electric File	Copy	KOMINFO	2009
7	National Disaster ManagementPlan 2010-2014	Electric File	Copy	BNPB	2009
8	Guidelines for Search, Rescue and evacuation (Regulation book)	Book	Original	BNPB	2010
9	Standardization of disaster data (Regulation Book)	Book	Original	BNPB	2011
10	Population exposed to hazards	Electric File	Copy	BNPB	2011
11	Role of PUSDALOPS PB in West Sumatra	Electric File	Copy	BPBD West Sumatra	2011
12	MoU between KOMINFO and BNPB	Electric File	Copy	KOMINFO, BNPB	2012
13	Standard operation Procedure for Disaster Management of PUSDALOP PB, Bali	Electric File	Copy	BPBD West Sumatra	2012
14	Tsunami Early Warning Service Guidebook for InaTEWS	Book	Original	BMKG	2012
15	Indonesia Tsunami Early Warning System (INATEWS)	Electric File	Copy	BMKG	2013
16	Indonesian Disaster Data 2012	Book	Original	BNPB	2013
17	Radio Communication Guidelines for Disaster (Regulation book)	Book	Original	BNPB	2013
18	Guidelines for the management of information and documentation (Regulation book)	Book	Original	BNPB	2013
19	Disaster Call Sign	Book	Original	BNPB	2013
20	the use of radio communications in disaster (Technical handbook)	Book	Original	BNPB	2013
21	Indonesia's experience in incorporating population data for disaster management	Electric File	Copy	BNPB	2013
22	BNPB Finance Report (Audited)	Electric File	Copy	BNPB	2013
23	Minutes of Meeting of Focus Group Discussion	Electric File	Copy	KOMINFO	2014
24	Annual Report 2013	Book	Original	KOMINFO	2014
25	Overview of NIX and Plapa Ring Plan	Electric File	Copy	KOMINFO	2014
26	National Midterm Development Plan 2015-2019	Electric File	Copy	KEMPPN/BAPPENAS	2014
27	Tsunami and Earthquake Information in BMKG	Electric File	Copy	BMKG	2014
28	BNPB and Central Jawa BPBD adress book	Book	Original	BNPB	2014
29	DM Disaster Management Data Communication & Information Channel	Electric File	Copy	BNPB	2014
30	Indonesia Experience on Development Disaster-Related Statistics Data	Electric File	Copy	BNPB	2014
31	InAWARE: Disaster Management Early Warning and Decision Support Capacity Enhancement Concept of Operations	Electric File	Copy	BNPB	2014
32	Profile of Emergency Operation Center of Bali BPBD	Electric File	Copy	BPBD Bali	2014
33	Sirens Activation And Deactivation	Electric File	Copy	BPBD Bali	2014
34	Procedure And Equipment Early Warning Operation & Emergency Disaster in PUSDALOP PB West Sumatra	Electric File	Copy	BPBD West Sumatra	2014
35	The Strategic Plan Ministry Of Communication And Informatics Year 2015-2019	Electric File	Copy	KOMINFO	2015
36	TOR of Disaster Information System	Electric File	Copy	KOMINFO	2015
37	Minutes of Agreement between KOMINFO and BMKG	Electric File	Copy	KOMINFO, BMKG	2015
38	Technical Agreement between KOMINFO and BMKG	Electric File	Copy	KOMINFO, BMKG	2015
39	National Disaster ManagementPlan 2015-2019	Electric File	Copy	BNPB	2015
40	Redesain USO	Book	Original	BPPPTI	2015

Appendix 7-2

Statistics

Region	Island	Province	The number of District/City	BPBD (*1)	The number of TV Relay Station	RADIO						Population (*2)	Population in Inundation Assumed Area (*3)				Benefiting Population (*4)			
						FM (RRI)	FM (Commercial)	AM (RRI)	AM (Commercial)	Short Wave (SW)	TOTAL	(2010)	Man	Woman	Total	Rate	TV (71.6%)	Internet (17.14%)	Mobile (125.4%)	Smartphone (14.0%)
1	Jawa	Banten	8	10	0	1	36	0	8	0	45	10,632,166	98,167	92,325	190,492	1.79%	7,612,631	1,822,353	13,332,736	1,488,503
		Jawa Barat	27	27	28	3	271	4	25	0	303	43,053,732	28,401	28,383	56,784	0.13%	30,826,472	7,379,410	53,989,380	6,027,522
		DKI Jakarta	6	7	12	1	47	2	18	1	69	9,607,787			0	0.00%	6,879,175	1,646,775	12,048,165	1,345,090
		Jawa Tengah	35	36	12	3	291	3	21	0	318	32,382,657	301,511	297,778	599,289	1.85%	23,185,982	5,550,387	40,607,852	4,533,572
		DI Yogyakarta	5	6	3	1	42	1	6	0	50	3,457,491	29,106	30,188	59,294	1.71%	2,475,564	592,614	4,335,694	484,049
		Jawa Timur	38	39	29	6	309	5	14	0	334	37,476,757	51,690	53,236	104,926	0.28%	26,833,358	6,423,516	46,995,853	5,246,746
		TOTAL	119	125	84	15	996	15	92	1	1,119	136,610,590	508,875	501,910	######	0.74%	97,813,182	23,415,055	#######	19,125,483
	Bali & Nusa Tenggara	Nusa Tenggara Tim	22	22	7	4	32	2	5	0	43	4683827	5499	5757	11256	0.24%	3,353,620	802,808	5,873,519	655735.78
		Nusa Tenggara Bar	10	11	4	1	40	1	1	0	43	4500212	40507	41714	82221	1.83%	3,222,152	771,336	5,643,266	630029.68
		Bali	9	10	11	2	60	1	2	0	65	3890757	78363	74710	153073	3.93%	2,785,782	666,876	4,879,009	544705.98
		TOTAL	41	43	22	7	132	4	8	0	151	13,074,796	124,369	122,181	246,550	1.89%	9,361,554	9,361,554	9,361,554	9,361,554
	Region1 TOTAL		160	168	106	22	1,128	19	100	1	1,270	149,685,386	633,244	624,091	######	0.84%	#######	32,776,609	#######	28,487,037
2	Sumatera	Aceh	23	24	7	6	71	1	0	0	78	4,494,410	139,179	131,418	270,597	6.02%	3,217,998	770,342	5,635,990	629,217
		Sumatara Utara	33	35	9	4	90	2	4	1	101	12,982,204	40,336	40,050	80,386	0.62%	9,295,258	2,225,150	16,279,684	1,817,509
		Sumatera Barat	19	20	10	3	66	2	3	0	74	4,846,909	135,193	138,507	273,700	5.65%	3,470,387	830,760	6,078,024	678,567
		Jambi	11	12	5	1	31	1	3	0	36	3,092,265			0	0.00%	2,214,062	530,014	3,877,700	432,917
		Riau	12	13	4	2	52	1	0	0	55	5,538,367			0	0.00%	3,965,471	949,276	6,945,112	775,371
		Kepurauan Riau	7	8	13	3	28	1	0	0	32	1,679,163			0	0.00%	1,202,281	287,809	2,105,670	235,083
		Sumatera Selatan	17	16	8	1	52	0	6	0	59	7,450,394			0	0.00%	5,334,482	1,276,998	9,342,794	1,043,055
		Bangka Belitung	7	8	1	1	21	1	0	0	23	1,223,296			0	0.00%	875,880	209,673	1,534,013	171,261
		Bengkulu	10	11	6	1	27	1	0	0	29	1,715,518	22,669	21,540	44,209	2.58%	1,228,311	294,040	2,151,260	240,173
		Lampung	15	15	8	1	62	1	0	0	64	7,608,405	6,606	6,141	12,747	0.17%	5,447,618	1,304,081	9,540,940	1,065,177
	Region2 TOTAL		154	162	71	23	500	11	16	1	551	50,630,931	343,983	337,656	681,639	1.35%	36,251,747	8,678,142	63,491,187	7,088,330
3	Kalimantan	Kalimantan Barat	14	15	4	3	35	1	4	0	43	4,395,983			0	0.00%	3,147,524	753,471	5,512,563	615,438
		Kalimantan Tengah	14	15	3	1	31	1	0	0	33	2,212,089			0	0.00%	1,583,856	379,152	2,773,960	309,692
		Kalimantan Selatan	13	15	15	1	58	1	2	0	62	3,626,616			0	0.00%	2,596,657	621,602	4,547,776	507,726
		Kalinamantan Timu	9	10	5	3	66	1	1	0	71	3,553,143			0	0.00%	2,544,050	609,009	4,455,641	497,440
		Kalimantan Utara	5	6	0	3	17	1	0	0	21									
	Region3 TOTAL		55	61	27	11	207	5	7	0	230	13,787,831	0	0	0	0.00%	9,872,087	2,363,234	17,289,940	1,930,296
4	Sulawesi	Sulawesi Selatan	24	25	11	1	87	1	8	1	98	8,034,776	344,263	362,109	706,372	8.79%	5,752,900	1,377,161	10,075,609	1,124,869
		Sulawesi Barat	5	6	0	1	11	0	2	0	14	1,158,651	20,840	21,117	41,957	3.62%	829,594	198,593	1,452,948	162,211
		Sulawesi Tengah	13	12	1	3	36	2	2	1	44	2,635,009	10,018	9,504	19,522	0.74%	1,886,666	451,641	3,304,301	368,901
		Sulawesi Tenggara	12	13	3	1	29	1	1	1	33	2,232,586	13,828	14,038	27,866	1.25%	1,598,532	382,665	2,799,663	312,562
		Sulawesi Utara	15	16	5	0	33	2	1	0	36	2,270,596	11,795	11,319	23,114	1.02%	1,625,747	389,180	2,847,327	317,883
		Gorontalo	6	7	3	1	11	1	0	0	13	1,040,164	1,404	1,445	2,849	0.27%	744,757	178,284	1,304,366	145,623
	Region4 TOTAL		75	79	23	7	207	7	14	3	238	17,371,782	402,148	419,532	821,680	4.73%	12,438,196	2,977,523	21,784,215	2,432,049
5	Maluku & Papua	Maluku	11	12	5	2	18	2	0	1	23	1,533,506	66664	64999	131663	8.59%	1,097,990	262,843	1,923,017	214690.84
		Maluku Utara	10	10	0	1	17	1	0	0	19	1,038,087	26062	25073	51135	4.93%	743,270	177,928	1,301,761	145332.18
		Papua Barat	13	12	1	4	14	3	0	1	22	760,422	2042	1859	3901	0.51%	544,462	130,336	953,569	106459.08
		Papua	29	30	5	9	16	6	5	3	39	2,833,381	3563	3166	6729	0.24%	2,028,701	485,642	3,553,060	396673.34
	Region5 TOTAL		63	64	11	16	65	12	5	5	103	6,165,396	98,331	95,097	193,428	3.14%	4,414,424	1,056,749	7,731,407	863,155
TOTAL			507	534	238	79	2,107	54	142	10	2,392	237,641,326	######	######	######	1.24%	#######	47,852,257	#######	40,800,868

*1 The number of BPBD (2013): "Call Sign" BNPB (2013)

*2 Population in Indonesia (2010): Population Census 2010 of Indonesia

*3 Population in Inundation Assumed Area (2014): "Report on Disaster Risk Reduction" BNPB

*4 Benefiting Population
- 4-1 TV penetration rate 71.6% (2009): "World Statics 2014" Ministry of Internal Affairs and Communications in Japan
- 4-2 Internet penetration rate 17.14% (2014) : ITU
- 4-3 Mobile penetration rate 125.4% (2013): Ministry of Internal Affairs and Communications in Japan
- 4-4 Smart Phone penetration rate 14.0% (2009): GLOBAL DIGITAL STATISTICS 2014