WORKSHOP REPORT

Philippines Kickoff Workshop and Meetings: 'CAP on a Map' for improving Institutional Responsiveness

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1 Executive Summary

The Philippines Atmospheric, Geophysical, and Astronomical Services Administration[1] (PAGASA), Philippines Institute of Volcanology and Seismology[2] (PHILVOLCS), and the National Disaster Risk Reduction and Management Council[3] (NDRRMC) are three agencies of foremost importance. Combined they are responsible for the monitoring, detecting, and warning of key natural hazards that continue to threaten and impact the Archipelago. On average, the Islands are exposed to 20 Typhoons each year; making PAGASA a very busy agency. The ocean fault lines are almost an arms reach away that gives PHILVOLCS less than a 20-30 minutes tsunami warning horizon. With the leadership of PAGASA, it is important that all relevant local and national level agencies[4] such as Philippines' National Mapping and Resource Information Authority (NAMRIA), Department of Health (DOH), Department of Education (DepED), Department of Interior and Local Government (DILG), Department of Public Works and Highway (DPWH), Philippine Coast Guard (PSG), National Telecommunications Commission (NTC), are involved in the project roll-out.

In all events, NDRRMC is tasked with disseminating the warnings to the grass-roots and activating response plans to safe guard the inhabitants. Hard constrained timeliness and coordination are critical factors challenging the entrusted agencies in the Philippines. To that end the Department of Science and Technology (DOST), the overarching governing agency of PAGASA and PHILVOLCS, in collaboration with the Office of Civil Defense (OCD), governing body of NDRRMC are dedicated to improving their systems. It is precisely those challenges that the 'CAP on a Map' project[5] aims to address with improving the institutional responsiveness to emergencies in the Philippines. It considers an all-hazard all-media approach with the Common Alerting Protocol[6] (CAP) as the interoperable content standard for exchanging life saving information. The Sahana Alerting and Messaging Broker (SAMBRO), with CAP at the helm, is designed to improve efficiency gains and effectiveness in sharing crisis information.

At the outset the project is partnering with the PAGASA to pave the way in implementing the project in the Philippines. The implementation would deploy the SAMBRO Multi Agency Situational Awareness (MASA) platform. It is intended to improve the situational-awareness for the disaster and emergency management agencies, like OCD, Metro Manila Development Authority (MMDA) and NDRRMC. The knowledge mobilized through the MASA software would enhance the coordination of the response to various hazard events and incidents. CAP is the supporting piece that fosters interoperability enabling the exchange of all-hazard alert/warning with multiple agencies and the public using all available

1 PAGASA serve aviation, maritime, tropical cyclone, flood, and telescopic (for star gazing) with monitoring telemetries and decision support website: http://www.pagasa.dost.gov.ph/index.php/products-and-services
2 PHILVOLCS website: http://www.phivolcs.dost.gov.ph/
3 NDRRMC website: http://www.ndrrmc.gov.ph/
4 Members of NDRRMC: http://www.ndrrmc.gov.ph/index.php?option=com_content&view=article&id=2&Itemid=107
5 CAP on a Map project page: http://eden.sahanafoundation.org/wiki/Deployments/SAMBRO#a1.CAPonaMap
6 Easy to comprehend CAP resources: http://en.wikipedia.org/wiki/Common_Alerting_Protocol

media. Therefore, the design and implementation must be a participatory community centric approach involving all relevant institutions and administrative strata.

Access to mobile phones per 100 households, in the Philippines, has grown from only 8% in 2000, to 104.5% by the end of 2013. Integrating mobile applications would be important source for pushing and pulling information. Access and use of the Internet among Filipinos has been growing at a steady and faster pace[7]. From only 2.6% in 2000, it has grown to approximately 37% in 2014. It would be appropriate to consider the power of the mobile phone in sharing situational information. Google Crisis Response and PAGASA have set the stepping stone with the first CAP implementation in the Philippines. PAGASA is now able to publish Typhoon alerts on to Google's Public Alerts[8] and push on to mobile phones via Google Now application to warn the public.

Sahana Software Foundation and the Asian Institute of Technology (AIT) Geoinformatics Center[9] are providing technical assistance to the Government of Philippines to achieve the goals and objectives laid down by the CAP on a Map[10] project. The project began in January 2015 with a grant made possible by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) Tsunami, Disaster, and Climate preparedness Trust Fund. The work in the Philippines, officially kicked-off, on May 19, 2015, with a one day workshop[11]. The workshop was hosted by PAGASA at the Amihan Conference Room, at PAGASA, in Quezon City - Manila. Workshop participants represented a mix of organizations belonging to hazard detection/monitoring, alerting authorities, first-responder agencies and TV broadcasters[5].

An important expectation of the workshop was to make the participants aware of the importance and value the project adds in complementing their emergency management practices. The Sahana Alerting and Messaging Broker (SAMBRO) software and related operating procedures was specifically designed to foster a MASA platform. It would offer efficiency gains and increase the effectiveness, once it has been implemented. A significant number of the participants realized the potential of SAMBRO and expressed interest in adopting the system.

7 Philippines Internet growth statistics: http://www.internetworldstats.com/asia/ph.htm
8 Google Public Alerts: https://google.org/publicalerts
9 Geoinformatics Center website: http://www.geoinfo.ait.ac.th/
10 CAP on a Map blog: http://sahanafoundation.org/cap-on-a-map-kickoff/
11 Workshop announcement on the Sahana wiki: http://eden.sahanafoundation.org/wiki/Event/2015/CAP_PH_PAGASA

2 Purpose of this report

This report serves three purposes:

1. share the discussions and outcomes perceived by the author to be used by Sahana developers to develop a blueprint (software requirements specification document)
2. feed in to the project's kickoff workshop report to be produced by AIT and communicated to ESCAP
3. Serve PAGASA lead CAP implementation technical committee as a reference to initiate project specific discussions

3 Ecology of Philippines disaster management

3.1 PAGASA

A 2012 risk report determined that Philippines faces, approximately, 20 Tropical Cyclones each year. These tropical cyclones instigate strong winds, excessive rainfall, floods, landslides (or mud flow), storm surges. They are most frequent and are severe between the months of June to December. The presentation by PAGASA discussed their current coastal hazard monitoring and detection as well as dissemination methods. Tropical cyclones are frequent and are a key instigator for several other hydrological hazards.

In terms of weather forecasting, the lead agency for this is the DOST's PAGASA. Its mission is to provide weather, flood, climate and astronomical products and services to promote the people's safety and well-being and contribute to national development. PAGASA is responsible for operating several weather and climate information detection stations. They range from offshore and on shore gauges. Some are Automated and others require manual intervention for feeding data for analysis.

Besides the headquarters in Manila, there are several regional stations strategically placed is various main Islands. These regional stations are autonomous. However, they consult with the headquarters in Manila when making critical decisions. PAGASA's ISP network ensures fast back-up and reliable Internet connections (3 ISPs connected to a load balanced, its operations are connected by a 1GB fiber optic connection between its weather forecasting and flood forecasting operations) to its main administrative office which is also connected to another ISP. It has an FTP (File Transfer Protocol) Server that links with various forecast and warning systems and through which it issues local forecasts/warnings thru PAGASA's regional centers.

PAGASA is mandated with issuing warnings directly to the public and focal points such as LGUs in the Barangay. They issue daily weather bulletins on the web and directly inform the TV and Radio stations of significant alarming hydrological and meteorological events. Other sources of dissemination include two-way radios, satellites, radio, telephones, text/SMS blasts, use of DSS tools and information on the Internet (email. Twitter, Facebook).

3.2 PHILVOLCS

Project team members met with the PHILVOLCS[12]. The key mandates of PHIVOLCS that is closely related to disaster risk management are carried out through its Volcano, Earthquake and Tsunami Disaster Risk Reduction Programs and Projects. The following are the major programs that PHIVOLCS is currently implementing: National Volcano Monitoring and Warning, National Earthquake Monitoring and Information, National Tsunami Monitoring and Early Warning, Earthquake Hazards and Risk Assessment, Earthquake Generation Potential of Active Faults and Trenches, Volcanic Hazards and Risk Assessment, Eruption and Magmatic History of Volcano Systems, . Volcano, Earthquake and Tsunami Disaster Preparedness and Risk Reduction, Strategic Human Resource Management and Development (SHRMD), Leadership Enhancement and Development (LEAD), Strategic Performance Assessment and Development for Excellence (SPADE).

PHIVOLCS introduced the “Information Portal for Philippine Earthquake and Volcano” on Sept. 15, 2014. The overall goal of the 5-year program is to enhance the capabilities of disaster management authorities and related organizations to respond to earthquake and volcano disasters through the proposed four components namely: (1) Real-time Earthquake Monitoring; (2) Evaluation of Earthquake Generation Potential; (3) Integrated Real-time Volcano Monitoring; and (4) Provision of Disaster Mitigation Information and Promotion of Utilization.

3.3 NDRRMC

It was evident from the discussions that the NDRRMC is an integral organization for coordinating information dissemination. NDRRMC has published the National Emergency Response Plan[13]. They have also published SITREPs and the Valley Fault System Atlas, which are important elements for the CAP on a Map project implementation. The dissemination processes seem laborious and multi sequenced resembling a relay of the

12 PHILVOLCS website: http://ocd.gov.ph/

13 NDRRMC published National Disaster Response Plan (June 2014). Consulted 2014 June 05 on the web: http://www.ndrrmc.gov.ph/attachments/article/1334/NDRP_Hydro_Meteorological_Hazards_as_of_2014.pdf

information from one strata to the other. Moreover, different agencies are mandated with hazard detection and monitoring but some such as tsunamis with a duration of 20-30 minute warning horizon are unable to complete the dissemination sequences in time.

SAMBRO would dilute those complexities by applying CAP information interchange standard as the mediator. SAMBRO's automation would remove the apparent delays and uncertainties resulting from the interdependencies. The Multi-hazard Early Warning Standard Operating Procedure[14] (SOP) lays down the process sequence (or work flows) for monitoring, detection, alerting/warning, and response. The chain of information flow is well established with a combination of technologies for limited set of medium to high impact hazard events.

3.4 Coast Guard and the Maritime

Sea transportation is most common with short, medium, and long range vessels between the Islands and out of the country. Sea is the livelihood of a large portion of the population. GSM/WCDMA coverage is weak or dark in certain areas within the boundaries of Philippines. VHF radios relatively a lot more reliable. The Government mandate is that every size of vessel must carry a VHF radio to be seaworthy. However, enforcing such a rule is laborious for the authorities. All boats used in public transportation carry a VHF radio but the small fishing boars don't.

A challenge faced by DOST is finding an effective technology to warn the small fishing boats who are outside of the mobile cellular reach. These boats do not carry HF radios for reasons such as the cost and the large battery power. Satellite are a reliable and effective solution that would cover the required footprint. There are several low cost satellite-enabled text-messaging[15] that can be paired with Smart Phones for alerting fishermen roaming in the deep waters. Digital Audio Broadcast[16] (DAB, DAB+, or DAM-T) is a low-cost and effective technology that allows for transmitting of audio and text streams. Digital Video Broadcast is the standard set for TV and DAB is for digital radio. DAB requires less power than DVB; thus allowing for mobile handsets ideal for fishermen. Moreover, a 2Kw DAB transmitter can broadcast up to an 80km radius. It is uncertain of the adaption of DAB in the Philippines.

14 Standard Operating Procedures for a National Early Warning System. ()
15 A few satellite-enabled messaging devices: 1) DeLorme In Reach SOS messaging (http://www.inreachdelorme.com/), Irridium Go (https://www.iridium.com/iridiumgo.aspx), and Yazmi tablet-PCs (http://www.yazmi.com/),
16 Digital Audio Broadcast for Alarm and Rescue: http://www.unescap.org/resources/presentation-digital-broadcasting-alarm-and-rescue-case-study-china-prof-guoyu-wang

3.5 Public and Emergency Health

Meetings were held with two known health experts who are quite involved in e-health in the Philippines. They had several insights to share. One was related to using public health alerts to educate the public of misconstrued information. The example was related to the public panicking to the death of two people who were poisoned but the media spreading the word that an Ice Tea product was the killer. Panicked public, who had consumed the same product, would flood the hospitals causing a chaotic situation for the health workers. In such a situations PhilHealth should be able to text-blast the public to reverse the misunderstanding. This is contrary to actual public health alerts of disease outbreaks. Alerting over the SAMBRO MASA platform allows them to integrate sharing messages across boarders as well as with ports authorities; other agencies who should be informed to be better prepared to contain the situation.

Emergency medicine and public health cuts a cross emergency situations. In all events where there are casualty and illness cases emergency medicine is inevitable. Philippines health services should be part of the CAP-enabled SAMBRO implementation Philippines e-Health initiative[17] forms the basis for the use of information technology in the Philippine health sector. The PeHSFP is patterned after the development framework of the WHO-ITU National eHealth Strategy Toolkit. It would be valuable to consult with them to ensure that they adapt to CAP to interoperate with the e-Health systems[18].

3.6 Philippines Disaster Recovery Foundation

Discussions with the Philippines Disaster Recover Foundation[19] (PDRF) realized the need to think of public utilities as an important partners who should be intertwined with the situational-awareness. Gas pipe explosion was a scenario discussed during a group exercise. Water and Electricity is privatized in the Philippines. Same as Telecommunications.

PDRF, soon to be termed as the Philippines Disaster Resilience Foundation is working towards complementing the efforts to develop stronger institutions and systems to mitigate and respond to disasters. It is public private partnership. They are interested in an integrated approach to shared situational-awareness for improving the response and inter-agency coordination.

17 Philippines e-Health: https://sites.google.com/site/ehealthpmophilippines/national-ehealth-governance-steering-committee-and-technical-working-group
18 National policies for e-Health: https://sites.google.com/site/ehealthpmophilippines/?pageDeleted=/national-ehealth-documents
19 PDRF website: http://pdrf.org/

4 Analysis and Discussion

There were six key discussion points:

1. Shared and distributed serves
2. Events to consider
3. Mobile phones and apps
4. Message priority
5. Train the Master trainer

4.1 Shared and distributed services

There is a misconception that PAGASA should be the sole owner and operator of a single server MASA to publish and subscribe CAP messages. It is not true; each organization is capable of hosting their own CAP-enabled SAMBRO on a server dedicated by their own organization managed by them. If they chose to, they could own and operate their own CAP publisher. The integral component is that every publisher should adopt the CAP standard and adhere to the country context CAP policies and procedures. When messages are exchanged using the CAP interoperable content standard, each agency can visualize the message in their own environment.

The CAP on a Map project has not budgeted resources to offer a server for each agency. Instead we will start with PAGASA as the host. Thereafter, PAGASA can take the lead in scaling the platform for all other agencies. For example, to begin with, NDRRMC will have access to the PAGASA server to view the common operating picture and to publish and subscribe to CAP messages. Once NDRRMC has accepted the technology and has built capacity and competency they can migrate to hosting their own internal server for managing the same, while PAGASA will continue to their mandated alerting/warning procedures.

4.2 Events to consider

The workshop participants, through a group exercise, exposed several hazards events of interest. The groups discussed events on tsunami, gas pipe explosion, localized flood, traffic accidents, and heavy rains. The discussions lead to agreeing on a manageable set of hazard events that would set the basis for the implementation. PAGASA and the CAP working group would, first, implement SAMBRO to offer respective alerting authorities and first-responder agencies to utilize the system. A set of agencies that would be potential alerting authorities, but not limited to: PAGASA, PHILVOLCS, NDRRMC, MMDA, DOH, DILG, DPWH, PSG, NTC.

4.3 Data and Documents

NAMRIA has plotted onto 1:50,000 topographic maps the identified surface traces of the **Philippines Fault Zones**. These are compiled applying GIS techniques such as MapInfo Professional and Generic Mapping Tool (GMT). Active faults maps are now available on this website and upon request to PHIVOLCS-DOST. They include Valley Fault System, Active Faults and Trenches, Earthquake-Induced Landslide, Liquefaction Susceptibility Map, Tsunami Prone Areas, Ready Project Maps, Risk Analysis Project.

Rapid Earthquake Damage Assessment System is a software that can produce hazard and risk maps before and immediately after an earthquake. It can generate: a) seismic hazard maps (Ground Shaking, Liquefaction, Earthquake-induced landslides and Tsunami); b) exposure database and c. risk assessment information.

Project NOAH[20] integrates current disaster science research and development projects and initiate new efforts within the DOST. The program works on challenges with communities situated in the country's 18 major river systems for enhancing Geo-hazard maps and storm surge vulnerability maps. As such, Project NOAH's goal is to provide high-resolution flood hazard maps and install 600 automated rain gauges and 400 water level measuring stations for 18 major river basins of the Philippines. These are the river basins of: Marikina River, Cagayan de Oro River, Iligan River Agno River, Pampanga River, Bicol River, Cagayan River, Agusan River, Panay River, Magaswang Tubig River, Jalaur River, Ilog-Hilabangan River, Agus River, Davao River, Mindanao River, Tagum-Libuganon River, Tagaloan River and Buayan-Malungun River Basin

Weather Information – Integration for System Enhancement (WISE) includes the Rapid Flood Simulation for Flood events under the DREAM Project (Disaster Risk Exposure and Assessment for Mitigation)

DREAM-LIDAR 3-D mapping Project involves working on flood modeling, hazard Information mediation, geo-hazard mapping through Light Detection and Ranging (LIDAR), Doppler system installation, landslide sensors development, storm surge inundation mapping. The maps have been produced for Leyte, Bohol, Eastern Samar and Iloilo.

At the heart of their DRR system is the **Advanced Remote Data-acquisition Unit** (arQ).

20 This was taken from http://noah.dost.gov.ph/

These are composed of various low power devices that can store, acquire, and process data gathered from various sensors in the field. According to the ASTI, there are over 1000 of these deployed scattered all over the Philippines.

The **nababaha.com[21] project** provides flood hazard maps in its site, and these are the product of flood simulations using Flo2d, a Federal Emergency Management Agency (FEMA)-approved flood routing application software. These hazard maps are indicative inundation maps for large flood events and useful only for knowing where not to be during extremely heavy rainfall. For local governments, these flood hazard maps can be used for localized emergency response. These hazard maps are only as good as the topographic map base that was used in the flood simulation. The project site mentions that - detailed and more accurate flood hazard maps of any city can be conducted upon request to the National Institute of Geological Sciences (NIGS), University of the Philippines Flood simulation team.

4.4 Mobile phones and apps

Philippines is known as the SMS capital of the world. They are a text savvy culture. Since English is a dominant language it is easy for Filipinos to adapt to Latin scripting applications. with a growing number of netizens and broadband penetration there are many apps that have gained popularity. Moreover, the implementors of warning and incident reporting systems are leveraging these opportunities. The report discusses a few of the mobile apps that are relevant to the project.

4.4.1 NDRMO National Text Blast System

Provide advisories, announcements to pre-registered SMART subscribers or to more or less 100,000 disaster managers. The system sends information to desired disaster managers to any specific locality Receive feedback, comments, suggestions, queries and other user-specific messages.

4.4.2 National Cell Broadcast

National Cell Broadcast System for the Public launched by OCD allows messages to be sent to a large number of cell phone subscribers in near real- time with location specific information. It is part of a nationwide early warning system for the public and can be used for critical information before, during and after any hazard event.

21 The project website: http://www.nababaha.com/

4.4.3 eBayanihan Project

eBayanihan[22] is a Ateneo de Manila University (ADMU) and Social Computing Science Lab developed project with funding from DOST. It is designed for a Nationwide Participatory SMS-Web based crowdsourced situational reporting system. Citizens send “CitReports” via SMS to eBayanihan phone number 29290911. A typical short message follows predefined structure: POST [KEYWORD], [URGENCY], [STREET BRGY MUNICIPALITY/CITY], [DETAILS OF SITUATION]. Most popular incidents are related to road/boat accidents, civil unrest in the Barangays, broken bridges, power brownouts, earthquake, fire, flood, landslide, heavy rain, request for relief, request for search & rescue, and strong winds.

4.4.4 Batingaw Mobile App

Batingaw means bell in the native language. The mobile app[23] was developed in partnership with Smart Communications Inc and Tudlo Developer. The app features allow for accessing relevant Government and NGOs websites, receiving twitter feeds, dictionary of the different hazards and saftety tips (before, during and after disasters), gigital tools in the time of a crisis (siren, flashlights, compass, strobe, e-library, FM ad AM radio).

4.4.5 GMA I'm Ready

GMA Network's IM Read Public Safety Portal[24], in partnership with Google, lead traffic navigation app Waze[25], and key Philippine government agencies. provides real-time updates on weather, flooding, geo-hazards, traffic situations, class suspensions, gas pump prices, and soon, even commute route options, metro train services and fare rates. The portal consolidates the breadth of information from its government partners, namely the Metro Manila Development Authority (MMDA), Department of Transportation and Communications (DOTC), Metro Rail Transit Authority (MRTA), Philippine National Railways (PNR), and the DOST.

4.4.6 Rappler and Project Agos

Rappler has gained its popularity among netizens; especially, advocated by the the concept of

22 Details about the project and the actual public reports can be accessed on the web: http://ebayanihan.ateneo.edu/learn_more

23 Batingaw mobile app launched by OCD-NDRRMC and Smart ,Inc. (2014 July). Consulted 2015 June 05 on the web: http://smart.com.ph/about/newsroom/press-releases/2014/07/25/ocd-ndrrmc-smart-launch-batingaw-mobile-app

24 The I am ready portal: http://www.gmanetwork.com/news/imready/

25 Get the best route every day; community-based traffic and navigation Waze mobile application: https://www.waze.com/

free disaster alert law[26]. With the hastag #WeatherAlert they publish daily weather information. These alerts generally originate from PAGASA-DOST. Rapper is not an alert originator but they are able to effectively render the alerts. Rappler is an information integrater. They have plans to move towards disaster alerts though SMS.

Project Agos is specific to disaster preparedness, response, and recovery. The geo-tagged social media reports essentially serve as incident reports or field-observation reports. This information, once deemed reliable, would be critical for emergency managers for determining and dispatching the necessary response resources.

4.5 Message priority

PAGASA has defined a set of color codes and numerical rankings[27] to indicate the severity and urgency of the hazard specific warning. Signal 1 through 5, color coded blue (1), yellow (2), orange (3), read (4), and purple (5) where 1 is a mild typhoon and 5 being the most severe typhoon. Heavy rain is categorized as Be Alert (Yellow), Be Prepared (orange), and Take Action (Red). These color-coded levels are used to provide information about its associated effects and what actions to take by the public. For localized system, Thunderstorm (TSTM) warning is issued which consists of three levels: Thunderstorm Information, Watch and Advisory. These warning levels are issued to the public to provide information on the likelihood of formation or threat of a thunderstorm and its associated hazards. These warning and threat levels are also associated with the Ready, Set, Go response actions. The termination of the warning should be done if the improvement in weather is expected for the next warning period and the reoccurrence of another heavy rainfall is least expected.

4.6 Train the Master Trainers

PAGASA will determine the two senior technical officers to be trained as Trainers. They will receive knowledge and practicums on the SAMBRO system administration, implementation, and operational aspects in supporting the MASA platform. The trainers will immediately train a set of other local cadres (potentially new CAP Stewards) belonging to various alerting authorities. One of the trainers is expected to be proficient in administering computer systems. The other would be skilled in early warning and would be introduced to CAP, its procedures, and ways for implementing and operationalizing SAMBRO.

26 Netizens speakup about the free disaster mobile alerts law. Consulted 2015 June 06 on the web: http://www.rappler.com/move-ph/issues/disasters/90336-netizens-speak-up-free-mobile-disaster-alerts-law

27 Philippine-Public-Storm-Warnings official gazette: http://www.gov.ph/crisis-response/the-philippine-public-storm-warning-signals/

4.7 Summary of the SWOT Analysis

The groups took part in discussing the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of implementing the CAP interoperable standard and SAMBRO software for multi-agency situational-awareness.

Strengths: 1. Access to shared hazard event information in near real-time 2. Improves inter-agency information sharing with the single entry of a message disseminated to all at once 3. Clearly defined communication flow with creating a message, authentication, and delivery 4. User friendly application with semi automation 5. Secure interaction with the system and secure delivery of information	***Weaknesses:*** 1. given the excessive data information entry and verification process removes real-time dissemination 2. Does not address messaging the illiterate 3. Human error and tampering with the messages can cause mass hysteria 4. Falls shy of a political initiative 5. No feedback or a mechanism to knowledge receved messages
Opportunities: 1. Crowd-sourcing information 2. Data sharing which is a, hard to overcome bureaucratic hurdle 3. Communicate across boarders and seek international assistance	***Threats:*** 1. Cloud implementation vulnerable to hacking and cyber attacks 2. Network coverage, electricity are external dependencies; fear of damage to dependent systems

There are a few facts that were mentioned as weakness and threats that need to be clarified to remove any misconceptions. These points are discussed in the subsequent subsections.

(1) Incomplete information
(2) Dependency on the Internet

4.7.1 Incomplete Information

There is a misunderstanding that the CAP messages disseminated contain limited information, such as with Short Message Service text delivered on to mobile phones. However, short text alone is inadequate and such a message should be complemented with a

descriptive message such as web page, radio or TV broadcast.

4.7.2 Internet uncertainties

Other discussions were on the needs for of building institutional capacity. PAGASA will require hardware and a data center to operationalize the SAMBRO. There were concerns on the reliability of the Internet remote Barangays (Villages) and the ability of Local Government Units (LGUs) to access the critical situational-awareness information.

5 Conclusion

The project team is excited that the PAGASA is interested in moving forth with the CAP on a Map project and lead the collaboration with relevant stakeholders to work towards achieving the project objectives. It is evident that there are challenges working within the Philippine Government Bureaucracy. However, PAGASA with its direct affiliation with the Department of Science and Technology is an advantage. PAGASA's prior experience working with Google on publishing CAP compliant Typhoon alerts is also advantageous. CAP on a Map will expand on that experience to include other hazards to the portfolio.

6 Acknowledgement

The author wishes to recognize the Philippines Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) for organizing the mission in Manila and the workshop. PAGASA team is also recognized for its contributions to the report with reviewing and recommendations for improvement. Our gratitude to the Philippine Institute of Volcanology and Seismology for inviting the team to a meeting and visit their monitoring and warning station. The workshop would not have been a success without the participation of the stakeholder organizations. We also recognize the meeting with the Philippines Disaster Recovery Foundation. Appreciate our project co-lead: Asian Institute of Technology Geoinformatics Center for being proactive in organizing the events and facilitating the related mission logistics. The project would not have been possible without the funding made possible by the ESCAP Tsunami, Disaster, and Climate preparedness Trust Fund.

7 APPENDIX A – Glossary of terms and acronyms

ADMU	Ateneo de Manila University
AIT	Asian Institute of Technology (Bangkok, Thailand)
Baranga	Village
CAP	Common Alerting Protocol
DAB	Digital Audio Broadcaster
DepED	Department of Education
DILG	Department of Interior and Local Government
DOH	Department of Health
DOST	Department of Science and Technology
DOTC	Department of Transportation and Communication
DPWH	Department of Public Works and Highway
DRR	Disaster Risk Reduction
DSS	Decision Support System
DVB	Digital Video Broadcast
ESCAP	Economic and Social Commission for Asia and the Pacific
FTP	File Transfer Protocol
GB	Gigabyte
GIS	Geographical Information System
GMT	Generic Mapping Tool
GSM	Global System for Mobile
HF	High Frequency
ISP	Internet Service Provider
ITU	International Telecommunication Union
Kw	Kilowatt
LEAD	Leadership Enhancement and Development
LGU	Local Government Unit
MASA	Multi Agency Situational Awareness (platform)
MMDA	Metro Manila Development Authority
MRTA	Metro Rail Transit Authority
NAMRIA	National Mapping and Resource Information Authority

NDRRMC	National Disaster Risk Reduction and Management Council
NTC	National Telecommunications Commission
OCD	Office of the Civil Defence
PAGASA	Philippines Atmospheric, Geophysical, and Astronomical Services Administration
PCG	Philippine Coast Guard
PDRF	Philippine Disaster Recovery Foundation
PeHSFP	Philippine e-Health Strategic Framework and Plan
PH	Philippine (2 letter code)
PHILVOLCS	Philippine Institute of Volcanology and Seismology
PNR	Philippine National Railway
SAMBRO	Sahana Alerting and Messaging Broker
SMS	Short Message Service
SOP	Standard Operating Procedure
SPADE	Strategic Performance Assessment and Development Excellence
SSF	Sahana Software Foundation (Los Angeles, USA)
SWOT	Strengths Weaknesses Opportunities and Threats
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TV	Television
UHF	Ultra High Frequency
UN	United Nations
VHF	Very High Frequence
WCDMA	Wideband Code Division Multiplex Access
WHO	World Health Organization
WMO	World Meteorological Organization

8 APPENDIX B – Next actions and topics to consider

8.1 Risk assessment data

Understanding the risks are a first step towards implementing a SAMBRO as a component of a national MASA platform. Risk assessment includes hazard mapping, vulnerability assessment, and risk analysis. Such an exercise is most effective in the presence of GIS-enabled hazard, vulnerability, census data, infrastructure data, and other points of interest. PAGASA-DOST lead technical committee, will lead the initiative in compiling the necessary GIS and other location specific data. PAGASA also promised to provide relevant statistics to use in the alert area mapping exercises.

8.2 Two National Trainers

The project will train two members belonging to agencies of the technical committee. There are two key resource persons:

1. Systems administrator who will be responsible for the maintenance of the SAMBRO system – beyond the current period of the project
2. CAP Technology Steward (an advocate and trainer scaling SAMBRO among all alerting authorities.

The Philippines community using SAMBRO will not be abandoned. There Sahana Community will be available to assist you and answer any of your questions.

8.2.1 Systems Administrator

A graduate in Engineering or Information Technology with credentials to prove they have, at least, two years of experience administering computer systems. SAMBRO system administration is minimal with simply updating the code from github (free), archiving the data and logs, ensuring continuity of the communications connecting the SAMBRO cloud services. The system administrator may be asked to alter the software code or develop new forms and work flows to enhance the SAMBRO human (user) computer interactivity and quality of experience.

8.2.2 CAP Technology Steward

CAP Steward would be the shorter label. The competent resource person would essentially be the CAP Guardian and a trainer also responsible for administering the CAP implementation in the Philippines. That includes learning the technology and procedures of

CAP and how it would serve in MASA. The individual will be trained to support a team of trainers who would become lead users of SAMBRO. The Technology Steward would continue to support and improve the CAP implementations and the new CAP resource persons of all relevant alerting authorities.

8.3 Data Center

8.3.1 Networking (TCP/IP)

The data center will comprise the computational capacity and the networking infrastructure. Redundancy is always encouraged for business continuity and disaster recovery for the data center. To begin with, a server to support SAMRBO Philippines instance and a network complementary redundancy for disseminating alerts.

A dedicated 128 kbps Internet line with another redundant Internet connection would sufficiently serve the purpose. A country vulnerable to frequent typhoons and earthquakes should be cautious of undersea interconnections and wireless towers exposed to severe weather. It is expected that PAGASA would own and operate the date center.

8.3.2 Server (high-end PC)

The project will contribute a high end server for PAGASA to host the SAMBRO National instance. The server will reside in the same data center, whereby only authorized users can access alerting and situational-awareness services. The server will run on a Debian operating system with the Sahana Eden Web2Py http application. The high end PCs would be sufficient because there will not be a great load of authorized users simultaneously accessing SAMBRO. The telcos and broadcasters would bare the dissemination communications load. Recommendation is a Dual Core Intel Pentium IBM xSeries like processing power high storage to work possibly in the capacity of a map server as well.

8.4 Evaluation

The evaluation is specific to the intervention and not the project in general. The project is keen in realizing the human computer interaction factors of the Philippine users. The study would involve simple interviews with relevant stakeholders part of the implementation, participatory rural appraisal with the communities, general recipients of the public alerts. Additionally, other goal oriented usability testing for technology acceptance would provide insights to better customize for an effective SAMRBO implementation.