WORKSHOP REPORT

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

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for the

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1 EXECUTIVE SUMMARY

The very severe cyclonic storm "NARGIS", in 2008 May, with 60-70 KMPH Gail winds crept over Southwest of Yangon, Myanmar[1]. It moved in a east-northeasterly direction devastating livelihoods and caused 90% casualties. Under its influence, rain and thundershower hammered in many places. The storm surge was the major cause of the disaster with 4m – 7m swells.

Since then, the Department of Meteorology and Hydrology (DMH) has applied modern science and technology to strengthen the systems and processes. Mandated by the Ministry of Transportation, DMH is responsible for the observation and notification of meteorological, hydrological, and seismological events. Drought, River Flood, Landslide, Tsunami, and Tropical Cyclones are major hazards that threaten Myanmar. The nation is always in the news every year with meteorological and hydrological events harming lives and livelihoods.

River floods are predictable and frequent. However, flash floods are unpredictable and the warning systems and procedures need an uplift to address those complexities. Pakokku region in 2011 during the open crop season, the farmers planted in the dry river creek bed as usual. A suddenly emerged cyclone along with heavy rains, upstream, caused a flash flood that killed 160 farmers[2]. There was no mechanism to forewarn them of the sudden-onset event.

Myanmar agencies practices are two types of alerting activities, one for alerting the public and other for activating the staff (or first-responders). Single Side Band (SSB), Telephones and Facsimile (Fax) are used to notify relevant Government and Non-governmental Organizations (i.e. focal points). DMH collaborates with the Relief and Rehabilitation Department (RRD) of the Ministry of Social Welfare, Relief, and Rehabilitation. RRD uses their reach to the Government Administrative Divisions (GADs) to disseminate the warnings to the Public through loudspeakers and mega-phones.

DMH has their own video recording studio. Daily and Weekly weather reports are televised at their studio and then delivered to the Myanmar Radio and Television (MRTV) Organization for broadcasting. Public warnings for DMH monitored hazard events are disseminated through the same Radio and TV channels to the public. Warnings are issues in Myanmar-bhasa (or Burmese) and English languages. TV and Radio Substations also translate the messages to the 17 other dialects spoken in Myanmar. Warnings are repeated 2-3 times/hour.

As part of the information stocktaking activity, AIT and SSF team members traveled to Tatkon, approximately 65 Km from the Nay Pyi Taw capitol city. We observed many farming community to be sparsely scattered and to be disconnected from the main electric power grid. They use oil lamps and some have small solar panels (5 bulb systems). DMH replies on TV and Radio to warn the public of

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1 The unfolding and aftermath of Cyclone Nargis time-line document by LIRNEasia:
  http://lirneasia.net/2008/05/cyclone-nargis-%E2%80%93-time-series-before-during-and-after/
2 Reliefweb: http://reliefweb.int/disaster/fl-2012-000140-mmr

severe weather events and provide situational reports. However, none of them without main grid consistent power would be able to operate a Television set..

Workshop participants also echoed the challenges with the coverage of electricity and its unreliability. A radio powered by batteries is the only alternative to receiving weather bulletins and special weather broadcasts from the Myanmar Radio and Television (MRTV). Relatively low powered mobile phones present to be a lucrative and inclusive solution to complement MRTV. LIRNEasia finds show 99% of the representative survey sample to carry a mobile phone.

Telecommunications are not yet or very little is adopted in pubic alerting. Telecommunications Service Providers (TSPs) would bill DMH for using their services such as with disseminating Short Message Service (SMS) or Cell Broadcast (CB) text-messages. A recommendation was for DMH to request, as part of a National policy in support of the emergency communications plan and licensing agreement or as part of the TSP Corporate Social Responsibilty, to provide a limited quantity of bulk SMS and possibly CB facilities for disseminating timely warnings.

DMH and associated organizations are keen in adopting impact based early warning. It requires comprehensively understanding the risks and the required response. At present DMH has surveyed to develop the hazard maps but has yet to undergo the tedious process of developing risk maps. There are a few flood and tsunami risk maps developed for targeted geographic areas. Implementation of a impact-based alerting and warning system would be beneficial. The Department of Irrigation expressed that with such alerts they would activate their resources to strengthen sea and river embankments or divert excess rain water to mitigate the impact from severe weather events.

Participants engaged in several group exercises. These discussions revealed language and digital literacy to be weak factors that would require special attention. People can read and write but lack knowledge in interpreting warning messages or scientific terminology. The Sahana Alerting and Messaging Broker (SAMBRO) with the underlying Common Alerting Protocol (CAP) standard and procedures would adress all those factors. CAP is designed for all-hazard all-media dissemination with a structure to accommodate multiple languages. Moreover, it removes ambiguity with consistent and complete messages that would provide instructions for laymen to understand.

2 PURPOSE OF THE REPORT

Myanmar has joined the consortium of early adopters of the Sahana Alerting and Messaging Broker (SAMBRO). The Myanmar implementation was initiated with this kick-off workshop and the preliminary meetings with relevant agencies for information stocktaking. This report discusses the findings from the mission from July 15 – 17, 2015.

3 ANALYSIS AND DISCUSSION

3.1 DMH Responsibilities

DMH is responsible for meteorological, hydrological, and seismological services. Tropical Cyclones, Heavy Rain, Landslides, River Floods, Drought, Fire, Earthquakes, and Tsunami are the most dangerous natural threats the Nation is susceptible to. Severe weather events, arising from the Bay of Bengal (southwest seas) and China (northeast mountains), are the main contributors to the meteorological and hydrological disasters. The Sunda Trench, within short reach of the western Myanmar cost, threatens the Nation with earthquake and tsunami. Although Myanmar is exposed to the Makram trench, it is not a significant threat.

3.2 Color coded warnings

DMH mandated services include detection, monitoring, and notification (or alerting). The notifications are in the form of warnings, bulletins, and forecasts. Storm warning incorporates a color coding to indicate the severity, certainty, and urgency with yellow (vigilant, storm is forming), orange (threat is eminent, trajectory is known), red (3 hours to impact), brown (crossing land), and green (All Clear).

3.3 Dissemination methods

There are three modes that the DMH channel their alerts and warnings. Email, bulletins posted on the their website, and Facebook are the new age technology adopted to publicly share. TV, Radio, and Newspaper, traditional media, are another source for informing the public. DMH operate their own recording studio, where daily weather and bi-weekly outlook bulletins are produced to support the TV and Radio news programs. people can call Nay Pyi Taw and Yagoon phone numbers to receive voice recordings of the weather bulletins.

Ministry of Social Welfare Relief and Rehabilitation (MSWRR) uses its State/regional Offices

to pass on the messages down the chains to the General Administrative Division (GAD) network who in turn warn the last-mile communities. Department of Relief and Rehabilitation (DRR) first receives the message from DMH. Thereafter, they must rewrite the warning along with a authorization letter in a descriptive way for the GAD and last-mile communities to understand.

3.4 Radio and Television

MRTV has been serving the country since 1946, for almost 70 years. MRTV has a small section handling disaster and daily weather forecasts that is aired after the news (7am, 8am, 1pm, 4pm, 8pm) and other special programs. The two week outlook is broadcast four times a week.

There are 11 news gathering bureaus scattered in the upper and low parts of Myanmar. MRTV is diverse in accommodating the 17 local languages. Three TV channels are dedicated with one serving Upper Myanmar, second serving Lower Myanmar, and the third dedicated to the ethnic people (channel 11 – termed as the National Races Channel). The broadcast programs have alloted time slots for each of upper (9 languages) and lower (8 languages).

Breaking news stories are sourced from the citizens, DMH, MSWRR, Ministry of Health, Red Cross Society, NGOs, and other Government Institutions. DMH in particular delivers the daily and weekly weather forecast video clips by car to MRTV relay station in Nay Pyi Taw. . Thereafter, Nay Pyi Taw relation transmits the video footage to the MRTV head office in Tatkon.

MRTV is moving towards digital TV. At present 1.5 million private households own DVB2 set-top-boxes and 0.5 million subsidized by government. Rest is UHF. The move towards DVB2 enhances MRTV's capabilities with targeted alerting. CAP and SAMRBO can very well complement with TV scrolls, maps, and visuals.

3.5 Other planned and ongoing initiatives

Floods are a recurring threat with several hundred lives lost each year. UNESCAP has developed the Hydrology SOP[3]. Plans are in place to install sirens and flash flood gauges with accuracy of 100cm incremental levels. (Japan International Cooperation Agency) JICA project established an end-to-end EWS storm warning system. New Mexico University has a

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3 James Williams – UNESCAP – is the expert developing the hydrology SOPs.

project Upper Myanmar; with Tsunami priority 2009 conducted table top exercises. JICA implementing SSB and Smart phones a project from 2013 – 2017. Now fax + phone to get message to GAD but community is Loudspeakers. Asia Disaster Preparedness Center (ADPC) and Regional Integrated Multi-hazard Early warning System (RIMES) is working on Irrawaddy and Rakhine state to improve coastal hazards.

3.6 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 in Myanmar.

Strengths:	Weaknesses:
1. Quick messaging with single entry of message shared with TV, Radio, DRR 2. Consistent and complete information shared at the click of a button	1. Addressing all 17 dialects in Myanmar 2. Last-mile communities are unable to understand the messages; especially the warning terminology 3. Dependencies on Internet for agencies outside of DMH to access SAMBRO
Opportunities:	Threats:
1. Receive alerts and warning from across boarders	1. Limited budgets to scale it Nationwide 2. Low cellular coverage to reach all areas 3. Power distribution is weak and not all households are covered 4. Unstable and weak internet

4 THE WAY FORWARD

In this section we discuss the next steps and elements to consider for implementing the Multi-agency Situational-awareness platform and the SAMBRO software for improving Maynmar's institutional responsiveness to hazards.

4.1 CAP Working Group

The workshop identified the Emergency Communications Committee (EmCC) as a potential candidate to oversee the advocacy and implementation of CAP. The EmCC falls under the administration of the National Disaster Preparedness Working Group and the Vice Precidents

Office. The EmCC comprises the members affiliated with the General Administration, Planning of Transportation, DMH, Foreign Affairs, Communications Office, Social Welfare, Ministry of Defense, to name a few. Therefore, the EmCC would be ideal for housing the CAP working group.

At present there are complications with bringing the current project to the EmCC and requesting to form a CAP Working Group. Given the Scope of the project, DMH would be able to fulfill the duties and responsibilities of serving as a CAP Working Group. The common consensus was that DMH serve in this capacity. Once, the project has revealed substantial results, then DMH would make the EmCC aware of the requirement to adopt the CAP Working Group and continue the endeavor to strengthen the National Multi-Agency Situational-awareness with CAP and SAMBRO.

4.2 Predefined Alert Area Polygons

Understanding the risks is a first step towards implementing a SAMBRO for impact-based targeted alerting with response actions. 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.

DMH experts, in meteorology, hydrology, and seismology have already undergone the exercise of developing hazard specific mock polygons for predefined alert areas. However, DMH should lead the initiative in compiling the necessary GIS and other location specific data to develop more precise predefined alert area polygons. Therefore, DMH should compile all hazard, vulnerability, and risk specific GIS data. Perhaps this also serves as an opportunity for DMH and the Government of Myanmar to request external assistance for improving the risk mapping in Myanmar.

4.3 Two National Trainers

The project will train two DMH staff members with the following skills:

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 Myanmar community using SAMBRO will not be abandoned. The Sahana Center of

Excellence and the Global Sahana Community will be available to assist you and answer any of your questions.

4.3.1 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.

4.3.2 CAP Steward

CAP Steward would be the shorter label for this candidate; essentially a CAP Technology Steward. The competent resource person would essentially be the CAP Guardian and a master-trainer responsible for administering the CAP implementation in the Myanmar and building CAP specific national capacity. That includes learning the technology and procedures of CAP and how it would serve in a MASA environment. 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.

4.4 Data Center

The data center comprises two key elements:

1. Networking infrastructure for interconnecting with rendering and dissemination entities
2. Server to host the SAMBRO application with access control and process the alert/warning messages

4.4.1 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, the data center should comprise a server to support SAMRBO Myanmar software instance and a network with 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 severe weather conditions and earthquakes should be cautious of exposed wireless towers and undersea interconnections . It is expected that DMH would own and operate the date center.

4.4.2 Server (high-end PC)

The project will contribute a high end server for DMH 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.

4.5 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 Myanmar 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. It is ideal if the evaluation can be coincided with any scheduled National drills (or simulations).

5 Conclusion

The project team is excited that the DMH 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. The group realized that the SAMBRO implementation, along with the policies and procedures, would allows for better coordination that leads to reduced risk. They also emphasized that the risk reduction would also contribute to and economic development. There are challenges working within the Myanmar Government Bureaucracy. Telecommunications coverage and available National budgets are other concern. However, DMH within its mandated power, leadership and reach to the Ministries will find ways to overcome these challenges.

6 Acknowledgement

DMH as taken a keen interest in the project and is quite compelled in assisting in the developments. To that the project expresses its sincere gratitude. Their enthusiasm was quite apparent from the level of effort put into organizing the workshop. The workshop would not have been a success without the participation of the stakeholder organizations. Sahana Software Foundation also appreciates the dedication of the 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 United Nations Economic and Social Commission for Asia and the Pacific Tsunami, Disaster, and Climate preparedness Trust Fund.

7 APPENDIX A – Glossary of terms and acronyms

AIT	Asian Institute of Technology (Bangkok, Thailand)
CAP	Common Alerting Protocol
DAB	Digital Audio Broadcaster
DMH	Department of Meteorology and Hydrology
DRR	Department of Relief and Rehabilitation
DVB	Digital Video Broadcast
ESCAP	Economic and Social Commission for Asia and the Pacific
GIS	Geographical Information System
GSM	Global System for Mobile
HF	High Frequency
ISP	Internet Service Provider
ITU	International Telecommunication Union
MASA	Multi Agency Situational Awareness (platform)
MOT	Ministry of Transportation
SAMBRO	Sahana Alerting and Messaging Broker
SMS	Short Message Service
SOP	Standard Operating Procedure
SSB	Single Side Band
SSF	Sahana Software Foundation (Los Angeles, USA)
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TV	Television
UHF	Ultra High Frequency
UN	United Nations
VHF	Very High Frequence
WMO	World Meteorological Organization