

PILOT WORKSHOP ON SYNERGIZED STANDARD OPERATING PROCEDURES (SSOP) FOR COASTAL MULTI- HAZARDS EARLY WARNING SYSTEM

Philippines

A highly successful two-day pilot workshop was conducted at PAGASA Science Garden, Quezon City, Philippines on 3 – 4 October 2013. The purpose of the workshop was to identify Standard Operating Procedures (SOP) best practices, gaps and needs, recommendations, and an action plan to meet the needs of the Philippines and of the project for the other 12 beneficiary countries involved.

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11/18/2013





Acknowledgments

This workshop was conducted as Activity 1.2 of Project Synergized Standard Operating Procedures for Coastal Multi-Hazards Early Warning System. The lead organizations for the project are the ESCAP/WMO Typhoon Committee and the WMO/ESCAP Panel on Tropical Cyclones in association with a wide cross section of partner agencies. Very kind appreciation is expressed to ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries who have funded this project; to the Philippines Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) for their vital assistance, support, and active participation in this successfully workshop; and to Asia Disaster Preparedness Center, Asia-Pacific Broadcasting Union, Typhoon Committee Secretariat, and to the Panel on Tropical Cyclones Secretariat who provided excellent support and insights as part of the team who visited the pilot countries.

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1. Introduction

The Economic and Social Commission of Asia and Pacific (ESCAP) / World Meteorological Organization (WMO) Typhoon Committee (TC) and the WMO/ESCAP Panel on Tropical Cyclones (PTC) in cooperation with other agencies recognized that there was a strong need to create synergies among different types of coastal hazard early warnings, including for tsunami, storm surge, high tide, high wave, strong wind, flood, and sediment disasters by reviewing existing Standing Operating Procedures (SOPs). They believed these synergies could be achieved through identifying best practices and specific gaps and needs for making existing Early Warning Systems (EWSs) fully operational for use in a multi-hazards context. Thus the Typhoon Committee and the Panel on Tropical Cyclones formulated, with the collaboration of other entities, and submitted the project Synergized Standard Operating Procedures (SSOP) for Coastal Multi-Hazards Early Warning System to ESCAP for funding through the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and South East Asia. The final version of the Letter of Agreement between ESCAP and TC to fund this project was signed on 1 August 2012. Unless otherwise agreed upon, the project termination date is 31 July 2014.

2. Project Overview

The long term goal of the project is to promote community resilience to coastal multi-hazards, including impact from land falling tropical cyclones, through effective SOPs for multi-hazards EWSs. The project is a collaboration with the Asia Disaster Preparedness Center (ADPC), Asia-Pacific Broadcasting Union (ABU), Global Alliance on Accessible Technologies and Environments (GAATES), Intergovernmental Oceanographic Commission (IOC) of UNESCO, Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), and United Nations Development Programme (UNDP) Asia-Pacific Regional Centre and involves thirteen beneficiary countries in TC and PTC regions. In addition, the project will coordinate with WMO, Asia Disaster Reduction Center (ADRC), and other TC and PTC countries in the region. The designated target groups include National Meteorological and Hydrological Services, National Tsunami Warning Centres, and National Disaster Management Offices in TC and PTC Members' countries.

The synergized SOPs are intended to be easily understandable and interpretable for decision makers, forecasters, and dwellers, like fishermen.

Activity 1 under this project is to collect, review, analyze, and synergize the existing SOPs for coastal multi-hazard EWS in Members' countries of TC and PTC. Based upon the analysis and synergizing, the project will develop a Manual/Handbook of Synergized Standard Operating Procedures for Coastal Multi-hazard Early Warning Systems.

The first item, 1.1, under this activity was to conduct a workshop for collecting and exchanging the performance status of coastal multi-hazard EWS in TC and PTC Members' countries at high risk. This was held on May 8-9, 2013 and was attended by 12 of the beneficiary countries, ESCAP, and the collaborating and coordinating agencies mentioned above.

The second item, 1.2, was to pilot the SSOP project in 3 selected countries. The three selected pilot countries selected were the Philippines, Bangladesh, and Pakistan. The Pilot Workshop held in the Philippines on 3 – 4 Oct 2013 was the first of several visits to this country as part of the pilot activity.

3. Purpose of the Workshops

Sub-Activity 1.2 of the project was to pilot the SSOP project with a focus on institutional capacity building from the national level to the local level - main emphasis on meteorological, hydrological, and disaster management services. Therefore based upon this, the workshop purpose was to:

- ▶ Review existing SOPs for coastal multi-hazards EWS for Hydro-meteorological, disaster management, media, elected official, and others from national to local levels
- ▶ Identified best practices, gaps and needs, and recommendations in both an agency's internal SOPs and also integrated SOPs among different agencies.
- ▶ Develop a plan of action to build upon the best practices, fill the gaps and needs, and to review the recommendations to build institutional capacity.

Based upon the Philippines in-country visit and the other two in-country workshops, to then develop a manual/handbook draft of synergized SOPs required in Sub-Activity 1.3.

4. The Three In-Country Pilot Workshops and Team Members

The three in-country pilot workshops were held:

- ▶ October 3-4, 2013 Manila, Philippines
- ▶ October 6-7, 2013 Dhaka, Bangladesh
- ▶ October 10-11, 2013 Islamabad, Pakistan

The team members for the Philippines and Bangladesh in-country visits were:

- ▶ Jim Weyman, Project Manager/Technical Advisor
- ▶ Olavo Rasquinho, Meteorological Expert, TCS
- ▶ Atiq Kainan Ahmed, Disaster Response Expert, ADPC
- ▶ Mr. Walter Welz, Media Expert, ABU
- ▶ Ahmed Said Al Barwani, Hydrology Expert, PTC

Since Mr. Weyman was unable to obtain a visa to Pakistan in time for the visit and Mr. Welz had a previously scheduled meeting, the team members for the Pakistan in-country visit were:

- ▶ Olavo Rasquinho, Meteorological Expert, TCS
- ▶ Atiq Kainan Ahmed, Disaster Response Expert, ADPC
- ▶ Mr. Nadeem Ahmed, Media Expert, ABU
- ▶ Ahmed Said Al Barwani, Hydrology Expert, PTC

Mr. Weyman did participate on several different occasions, especially during the groups' presentations following the breakout sessions, via Skype from his home.

5. Workshop Programme Overview

The programme for the workshop was jointly developed by members of PAGASA and the Project Manager (see Appendix I). Approximately 29 people attended all or part of the workshop (see Appendix II for list of attendees).

After the welcoming remarks by Dr. Vicente Malano, OIC, PAGASA and a message by Mr. Olavo Rasquinho, Secretary, Typhoon Committee, the Programme was broken down into five sessions on each of the two days. These included:

5.1 Day 1:

Session 1: Roles and Responsibilities in Coastal Multi-hazards Early Warning System at national, district, and local levels.

Session 2: Identification of Issues, Gaps, and Challenges in Early Warning System.

Session 3: Roles of Standard Operating Procedures (internal, external, and integrated) for Early Warning System including Development Procedure and Annual Review

Session 4: Identification of Issues, Gaps, and Challenges in Early Warning System Standard Operating Procedures.

Session 5: Plans and Thoughts for the Future.

5.2 Day 2:

Session 1: Mapping and Modeling the Storm Surge Hazard

Session 2: Bridging the Gaps in the SOPs for Early Warning System – The Road Ahead

Session 3: Challenge to Issue Effective, Understandable Forecasts, Advisories, and Tropical Cyclone Bulletins

Session 4: Building Relationships

Session 5: Goals and Completion Dates

NOTE: The Typhoon Committee Secretariat will establish a web page at the Typhoon Committee web site (<http://www.typhooncommittee.org>) which will include the presentations given at the pilot workshops, the project documents and reports, and a possible blog for comments and discussions.

NOTE: During the workshop, some items were presented and discussed which were not directly related to this SSOP project. However, many of these were kept and could be used in the future as part of an overall needs analysis in this area.

6. Workshop Day 1 – 3 October 2013

6.1. Session 1: Roles and Responsibilities in Coastal Multi-hazards Early Warning System at national, district, and local levels.

This session started with Mr. Weyman giving a presentation on the overall SSOP Project: its strategy, framework, expected outcomes, structure, objectives, goals, and activities; collaboration and coordination partners; and the steering committee, project manager, and task team associated with the project. He then discussed the three in-country pilot workshops, the team members, and the purpose of the workshops. At the end, he presented the conclusions and recommendations from the 8 – 9 May 2013 Initial Workshop in Bangkok, Thailand in the areas of the proposed SSOP Manual/Handbook; training and human capacity building; infrastructure capacity building; and gaps and needs in dissemination, warnings, and coordination.

This presentation was followed by 5 presentations on the roles and responsibilities in coastal multi-hazard EWS in the areas of:

6.1.1 Hydro-meteorological Services – Mr. Robert Sawi, OIC Weather Division, PAGASA. Mr. Sawi presented information on National Hydro-Meteorological Services, Background on Weather System affecting the Philippines, Early Warning System for Coastal Communities (with examples of warnings), and Information Dissemination.

6.1.2 Disaster Management – Mr. Edgardo Ollet, Regional Director, OCD NCR. Mr. Ollet discussed the legal framework of the Philippine Disaster Risk Reduction and Management (NDRRM) program as contained Republic Act (RA) No. 10121 of 2010 and the associated National Disaster Risk Reduction and Management (NDRRM) system. The 2011 – 2028 plan has a projected end state of a well-informed and well-organized resilient Filipino community on disaster risk reduction management. The composition of the NDRRMC is replicated at the regional and the local levels down to the Barangay: Regional, Provincial, City, and Municipal DRRMCs and Barangay Disaster Committees.

6.1.3 Media - Helen Flores, Reporter, Philippines Star. Ms. Flores presented research findings that show media are among the most important sources of information during and after natural disasters; media have the capability of translating scientific findings into more simple terms so that people or concerned parties may act on such information; media can influence the public belief and behavior about risk; media generally try to obtain information about a disaster from authoritative sources; journalists spend little time reviewing background and/or technical documents about natural hazards, preferring to quote a key government official; attributing statements to sources is a key element of maintaining objectivity in news reporting; and press releases were the most frequently cited source in news articles. She suggested mutual professional respect between scientists and journalists could be the solution to the accuracy problem.

6.1.4 Elected officials – Mr. Roland Galicia, OIC, Taguig DRRMO. Mr. Galicia briefly discussed RA 10121, aspects of EWS, disaster situations in Taguig, and DRRMO organization. He then suggested elected leaders should provide effective governance and institutional arrangements and ensure development, establishment, and implementation of a EWS at all levels including local and community-based. In regards to early warning systems, he said that he believed development and sustainability of EWS requires political commitment and dedicated investments; that it must be an integral part of all levels of the government's (national and local) disaster risk management plans and budgets; legislation must explicitly define roles and responsibilities of various authorities and agencies; implementation of early warning systems requires a clear concept of operations and standard operating procedures, enabling effective coordination among agencies across the components of early warning systems, at national and local levels (horizontally and vertically), and; systematic feedback and evaluation at all levels are needed with established mechanisms to translate the information gathered to corrective actions for system improvement over time.

6.1.5 Other Related Fields – Dr. Renato Solidum Jr., Director PHIVOLCS. Dr. Solidum described the tsunami hazard and risk in the Philippines (including some past examples, both local and distant) and items related to risk reduction. He then discussed the 4 aspects of EWS (hazard and risk assessment, monitoring, warning and dissemination, and proper response) related to tsunami for the Philippines. One of his key messages was successful early warning

system needs active participation at all levels: national, regional, local governments and agencies, private, professional and civil society organizations, communities, families, individuals. He concluded that elements of an effective tsunami warning system should include: 1) a dense, real time network of seismic stations for accurate detection, location and evaluation of tsunami potentials of earthquakes; 2) real time sea level monitoring network for tsunami wave detection and confirmation; 3) Rapid communication system for relaying alert and warning information to authorities and the public; 4) local mass alerting system (ex. sirens, bells, public address system, social media, etc.) for signaling and disseminating evacuation orders; 5) availability of accurate hazard and evacuation maps indicating inundation areas, shortest escape routes and safe evacuation sites; and 6) a well-informed and prepared citizenry to ensure proper action and response

6.2 Session 2: Identification of Issues, Gaps, and Challenges in Early Warning System.

In a quick summary it was noted that:

- ▶ the media needs quick, accurate information in simple language to broadcast. This should be in the form where they can take what they receive and quickly convey to the public without much editing or changes;
- ▶ challenges associated with a successful early warning system require active, integrated participation at all levels: national, regional, local governments and agencies, private, professional and civil society organizations, communities, families, individuals; and
- ▶ effective governance and institutional arrangements, political commitment, legislation defining explicit roles and responsibilities of various authorities and agencies, and a clear concept of operations are required.

In the discussion in regards to early warning systems, Mr. Galicia offered a good summary. He said that he believed development and sustainability of EWS requires political commitment and dedicated investments; that it must be an integral part of all levels of the government's (national and local) disaster risk management plans and budgets; legislation must explicitly define roles and responsibilities of various authorities and agencies; implementation of early warning systems requires a clear concept of operations and standard operating procedures, enabling effective coordination among agencies across the components of early warning systems, at national and local levels (horizontally and vertically); and systematic feedback and evaluation at all levels are needed with established mechanisms to translate the information gathered to corrective actions for system improvement over time.

Also, Dr. Solidum offered an excellent summary by concluding that elements of an effective tsunami warning system should include: 1) a dense, real time network of seismic stations for accurate detection, location and evaluation of tsunami potentials of earthquakes; 2) real time sea level monitoring network for tsunami wave detection and confirmation; 3) Rapid communication system for relaying alert and warning information to authorities and the public; 4) local mass alerting system (ex. sirens, bells, public address system, social media, etc.) for signaling and disseminating evacuation orders; 5) availability of accurate hazard and evacuation maps indicating inundation areas, shortest escape routes and safe evacuation sites; and 6) a well-informed and prepared citizenry to ensure proper action and response

6.3 Session 3: Roles of Standard Operating Procedures (internal, external, and integrated) for Early Warning System including Development Procedure and Annual Review.

6.3.1 Hydro-meteorological Services - Dr. Susan Espinueva, Chief, HMD, PAGASA. Dr. Espinueva described the hydrologic and meteorological services and products PAGASA provides and the SOPs, protocols, and Manuals PAGASA has for weather forecast and tropical cyclone services, hydro-meteorological services, and climate and farm weather services. In PAGASA, tasks with SOPs include: analysis of observed data and outputs from various numerical weather prediction models; formulation of bulletins/advisories/warnings; and issuance and dissemination of forecasts and warnings. PAGASA has found that standardization of activities/procedures that require immediate action save time and energy explaining procedures, provide consistency to internal and external functions of the agency, and meet the standard of performance required. They believe that externally SOPs can assist to set a uniform code of response to any unforeseen situation, describes a series of actions sanctioned by an authoritative body, reduces overall risk while increasing the public trust and satisfaction, and increase policy compliance by providing training materials and on-site reference.

Dr. Espinueva stated that procedures for development of SOP should include: 1) identify prone areas affected by the hazard; 2) consult various stakeholders concerning their requirements for specific situations at each level of the operation; 3) draft an easily understandable flowchart which contains the purposed plan of action, responsibilities, and chain of command; consult concerned stakeholders; 5) review remarks and make appropriate changes; and 6) test and fine tune. SOPs should be specific, dynamic, and sensitive to policy makers and public needs. Hazards behave differently and may affect different time scales and geographical areas, but other elements of most EWS are very similar and therefore multi-hazard SOPs can contain similar processes of monitoring, staged warning levels (e.g., green, yellow, red levels) and process of developing and disseminating warnings.

Dr. Espinueva ended by noting that PAGASA now has MOUs/MOAs with the media and disaster services and has good SOPs concerning urban flooding, heavy rain, and segmentation. However, she felt that the major need was for integrated SOPs internally and externally.

6.3.2 Disaster Management - Mr. Edgar Allan Tabell, OIC, Executive Director Patrol 119 DILG. Mr. Allan spoke about the Compendium of Disaster Preparedness and Response Protocols which was completed by a team from the Bureau of Local Government Supervision, Department of the Interior and Local Government (DILG) in 2012. It contains protocols for local governments (guide to action for the Governor or Mayor) during pre-calamity, during calamity, after calamity periods. There are 7 protocols associated with the pre-calamity period and 17 tests specified to ensure these are accomplished. For the calamity period there are 3 protocols specified, and for after calamity there are 5 protocols. In addition, there are 4 other guides to action during and after the calamity. Mr. Allan also discussed Red flag reports which are significant incidents which could have potential major impact or may require immediate action/decision by Secretary of Interior and Local Government. Discussion of their dissemination of PAGASA bulletins and the redundancy that is available to assist in ensuring correct, useful information is available. The National CODIX Organization operations center monitors, alerts, and conducts operations as needed.

During the discussion afterwards, it was mentioned that SOPs could be of value to provide the needed detail, routine, repeatability, and training during the 3 steps and the associated 15 protocols and the other 4 guides to action. It was also noted that increased coordination with

the media and PAGASA could be helpful, especially at the local level. Mr. Allan also mentioned that he believed that there was very good awareness of the tsunami threat, but less knowledge on preparing and stated that that a better knowledge of each other's (NTWC, regional, DRRMO, local, and evacuation) SOPs was needed. He also mentioned as possible challenges to long term sustainability of EWS; the impact of climate change on DRR procedures and approach; the need for additional emergency operations centers; EWS agents at national, sub-national, district and local community levels; the continued operations and maintenance of EWS equipment, the requirement for integrated systems and procedures, and additional types of legal standing orders from the National level.

6.3.3 Media - Ms. Girlie Bangonan, Chief, ROD PIA. Ms. Bangonan discussed the Philippine Information Agency (PIA), directly serves the Presidency and the Executive Branch on the national, regional and provincial levels through its sixteen regional offices and seventy one provincial information centers. PIA's core services include information gathering/research, production and dissemination, and institutional development and capacity – building focusing on alliance-building, networking, communication-related training, consultancy and technical assistance. The Philippine Information Agency is committed to provide a national mechanism for the free flow of timely, accurate and relevant information to enhance people's capabilities in decision - making and identification of opportunities for growth and development and thus can play a vital role in disseminating information as part of a EWS.

She emphasized that the wording of EWS alerts and warnings must be prepared in a way that they can be easily read by the media to the public. They do not have the time to reword or translate. She also emphasized that there should be a fail-safe process to verify to ensure the alert was official. The media must be provided broadcast quality material with proper references. She mentioned that there was general consensus on the need for SOPs

6.3.4 Related Fields - Dr. Renato Solidum Jr., Director PHIVOLCS. The key messages from Dr. Solidum presentation were: 1) tsunami is a rapid onset event; 2) SOPS are critical in various phases of tsunami early warning especially in monitoring, warning dissemination and proper response; 3) SOPs should be established at various levels, especially by: monitoring agencies, national to local governments, disaster risk reduction and management offices, preparedness and response related organizations, shipping and fishery sector; and 4) SOPs should be regularly tested, evaluated, and improved. He mentioned that SOPs standard definition includes: set of written instructions describing a routine; repetitive activity followed by an organization; stakeholder agreed-upon steps that will be used in coordinating Who, What, When, Where and How aspects of the Tsunami Emergency Response Plan. Dr. Solidum emphasized that SOPs must be coherent and integrated among different agencies such as Regional Tsunami Watch Centers, National Tsunami Watch Centers, Disaster Risk Reduction and Management Offices, and evacuation SOPs of coastal communities for tsunami events. Timing of different actions and communications are very important and therefore must be coherent and integrated.

Dr. Solidum indicated that for long-term sustainability and reliability of tsunami early warning emergency response plans he believed that tsunami be included in multi-hazard emergency response plans; system redundancy is required; tsunami messages must be transmitted via multiple communication pathways to established 24x7 agencies; Disaster Risk Reduction and Management Offices be operated 24 hours per day, 7 days per week;

tsunami warning messages be clearly stated and the meaning of messages and appropriate actions be understood and automatically implement by all sectors (DRRMO, media, general public, etc.); and finally to ensure coordination and implementation of an end-to-end EWS all levels of government must encourage and build partnerships with all stakeholders (media, education, civil society organizations, businesses, public organization, etc.).

He then described PHIVOLCS experience with development of internal SOPs for earthquake, tsunami, and volcano monitoring and warning through capacity building on tsunami SOPs with IOC and PTWC; capacity building of additional PHIVOLCS staff from seismic field stations and volcano observatories; and testing of SOPs through exercises (drill, communication exercises; internal, with external participation) and actual events. He then provided a sample minute by minute SOP outline for monitoring and warning with different, specific chapters and contingencies for unexpected items, such as loss of commercial power. He also described their media plan during an event and concluded with the importance of drills and exercises.

6.4 Session 4: Identification of Issues, Gaps, and Challenges in Early Warning System Standard Operating Procedures.

Some of the important ideas discussed during this session were:

- ▶ Dr. Espinueva noted PAGASA has MOUs/MOAs with the media and disaster services and has good SOPs in most areas. However, she felt that the major need was for integrated SOPs internally and externally.
- ▶ Mr. Allan indicated increased coordination with the media and PAGASA could be helpful, especially at the local level. He believed there was very good awareness of the tsunami threat, but less knowledge on preparing and stated that that a better knowledge of each other's (NTWC, regional, DRRMO, local, and evacuation) SOPs was needed. He also mentioned as possible challenges to long term sustainability of EWS:
 - the impact of climate change on DRR procedures and approach;
 - need for additional emergency operations centers;
 - EWS agents at national, sub-national, district and local community levels;
 - continued operations and maintenance of EWS equipment;
 - requirement for integrated systems and procedures; and
 - additional types of legal standing orders from the National level.
- ▶ Ms. Bangonan emphasized that the wording of EWS alerts and warnings must be prepared in a way that they can be easily read by the media to the public. They do not have the time to reword or translate. She also emphasized that there should be a fail-safe process to verify to ensure the alert was official. The media must be provided broadcast quality material with proper references. She mentioned that there was general consensus on the need for SOPs
- ▶ Dr. Solidum emphasized that: 1) tsunami is a rapid onset event; 2) SOPS are critical in various phases of tsunami early warning especially in monitoring, warning dissemination and proper response; 3) SOPs should be established at various levels, especially by monitoring agencies, national to local governments, disaster risk reduction and management offices, preparedness and response related organizations, shipping and fishery sector; and 4) SOPs should be regularly tested, evaluated, and improved. He also indicated that he believed that for long-term sustainability and reliability of tsunami early warning emergency response plans, tsunami be included in multi-hazard emergency

response plans. He also emphasized system redundancy is required and tsunami messages must be transmitted via multiple communication pathways.

6.5 Session 5: Plans and Thoughts for the Future.

This session included 4 presentations by 4 of the Pilot In-Country Team on meteorological, disaster management, media, and hydrological insights.

6.5.1 Meteorological Insights into SOPs, Mr. Olavo Rasquinho, Secretary, Typhoon Committee. Mr. Rasquinho first discussed the 4 components of a people centered EWS (according to the United Nations International Strategy for Disaster Reduction (ISDR) Secretariat: risk knowledge, monitoring and warning service, dissemination and communication, and response capability. He then covered the definition of a SOP which is a prescribed set of steps to be followed routinely when certain defined conditions arise. It contains a written procedure of individual, often sequential, tasks that need to be undertaken. By documenting these steps, in the form of a checklist or other appropriate framework, operational staff has a ready reference of what is expected and can avoid the risk of missing key actions. If SOPs are written down and documented simply, anyone can follow the instructions to make sure the procedure is completed. The main objectives of SOPs is to provide, in a concise and convenient form, a list of major actions involved to ensure that all concerned ministries, departments and all other stakeholders are informed clearly about their respective roles and responsibilities; to ensure a systematic early warning system is clearly outlined for all major hazards; to ensure there is an integrated early warning system in the overall disaster risk management system. SOPs are important because they capture the most efficient and effective ways to perform an operation. They help an agency produce predictable, reproducible results and maintain the quality and consistency of its service. SOPs are particularly useful between organizations. A NMS can use SOPs to ensure consistent delivery of services and products to partner agencies and provide a baseline on which the service standards can be reviewed.

Mr. Rasquinho then discussed the different styles of SOPs which include simple steps or a checklist; hierarchical steps; linear graphic flow chart; annotated pictures; and branching flowchart. Each has good and useful aspects in different situations or for different items. He then provided a general SOP format which can be considered.

Memorandum of Understanding (MoU) between NMHSs and partner agencies are highly recommended (e.g., Disaster Management Agencies, Media organizations) and SOPs can be used to describe in detail how the two agencies will routinely work together during a real-time event. There is a WMO document which may be useful which “Guidelines for Creating a Memorandum of Understanding and a Standard Operating Procedure between a National Meteorological or Hydro-meteorological Service and a Partner Agency”, WMO-No. 1099, PWS-26. These guidelines include a generic template that describes the important parts of a MOU. The template should be used as a guide, rather than as a prescriptive recipe. The particular circumstances of a NMHS and its partner agency will determine which components of the template should be included and what provisions should be addressed. Instructive examples of MOUs are included between a NMS and a Disaster Management Agency and between a NMS and a media organization.

6.5.2 Disaster Management Insights into SOPs, Mr. Atiq Kainan Ahmed, Programme Specialist, ADPC. Mr. Ahmed began by discussing that disaster risk management (DRM) is commonly seen as a ‘cyclical process’ composed of prevention and mitigation, preparedness, response and recovery. But DRM can also be seen through low and high resilience lens which is part of the “Coastal Community Resilience” Initiative. SOPs are comprised of written essential protocols and procedures and varies at various layers and can include procedures for the EWS information source providers/ met offices (e.g. observers, forecasters, meteorologists, PWS officers); emergency operation centers; national agencies, sub-national and local governments for EW provisions, dissemination and response; community EWS agents (e.g. village agents, volunteers and communities); operations and maintenance of EWS equipment; humanitarian response coordination (e.g., ICSs, Clusters procedures); integrated or interoperable systems, and implementation Of Standing Orders (e.g., with national level legal bindings).

SOPs help in critical decision and trigger points of DRM where timely decision making is critical and actions are pre-agreed in a ‘procedural manner.’ A decision point is usually a point in time where the evolving situation reaches a geographic or financial milestone that was deemed to be significant and the cause for some type of decision. (Examples: decision to evacuate, decision to close schools, beaches, roads, etc.). A trigger point is usually a point in time where the evolving situation reaches a geographic, financial, or response milestone that was deemed to be significant and the cause for a pre-determined action.

Mr. Ahmed suggested some areas of procedure development with DRM insights which included: 1) ‘seamless integration’ of science based observations and forecasting, warning generation and dissemination is desirable; 2) consideration of not only the extreme events but also the regular times as well which relates the time line of weather events and forecasts with DRR activities and applications; 3) there are some good examples from tsunami procedures for ‘end-to-end’ integration of regional-national-local components of EWS (from detection to preparedness and response.....); 4) ‘last mile warning dissemination’ is critical for rapid notification; 5) procedures for risk which includes hazard x exposure x vulnerability should include physical and social risks, enhancement of risk knowledge, risk modeling, and long term changing patterns of risks; 6) procedures for ‘evacuation’ are needed and should be coordinated; SOPs can help for systematic coordination and to deal with limited supply vs. large need during ‘disaster relief and response coordination’; and 7) procedures for ‘vulnerable group’ inclusiveness (e.g., disable, child, elderly, people of special needs) can range from universal design, accessibility to information and structures to other needed measures.

Mr. Ahmed emphasized what Dr. Solidum stated previously that SOPs must be coherent and integrated among different agencies such as Regional Tsunami Watch Centers, National Tsunami Watch Centers, Disaster Risk Reduction and Management Offices, and evacuation SOPs of coastal communities for tsunami events. Timing of different actions and communications are very important and therefore must be coherent and integrated.

In the specific area of SOPs, Mr. Ahmed suggested that SOPs should be synergized from existing good practices on each of the 4 elements of a proposed EWS. SOPs in DRM have been shown as key preconditions of DRM system efficacy and functioning through: mainstreaming the procedures into the DRM component and cycle; seamless integration of EWS through process is an essence of time, particularly in the changing climate; inclusive of

science, systems and societal integration; targeted to link with the DRM-CCA plans, resilience plans and processes from the beginning of development; development of policy and legislative backing of the procedures; and incorporation of procedures for innovative mechanisms for financing DRM-CCA.

6.5.3 Media Insights into SOPs, Mr. Walter Welz, Consultant, ABU. Mr. Welz began with a brief background on the Asia-Pacific Broadcasting Union. It was formed in 1964 and has 255 members in 63 countries. The ABU promotes the collective interests of television and radio broadcasters and encourages regional and international co-operation between broadcasters. A EWS should have a redundancy mechanism, however this can be cost prohibitive. Thus, an efficient alternative is the usage of the broadcast media as the primary EWS. The broadcast media is a well-placed, cost efficient and sustainable medium to serve that role. The 2010 World Telecommunication/ICT Development Report states that 82% of Arab and Asia household have televisions whereas Pacific households had 75 per cent. However, radios continue to play an important role in LDCs and in Africa, particularly in rural areas where incomes tend to be relatively low and where electricity is limited. In LDCs, radios are also more prevalent than TVs – about a third have a TV, compared to two-thirds with a radio.

It is better if the media voluntarily adopt and adhere to a SOP, however, in some national broadcast media markets, SOPs in the broadcast industry will work better if developed within a regulatory binding framework. Equally important is the formalization of linkages and information flows from early warning authorities to broadcasting outlets through some type of agreement such as a MOU. MOU's also may be more effective within a regulatory framework. For the media, the basic concepts and elements of an SOP should: be clear, concise and simple; be written; be timeline based, especially for rapid onset disasters such as a near-field tsunami; emphasize different types of disasters may require different SOPs; assign responsibilities to a position(s), with a back-up for each responsibility; contain modes of primary and back-up communications (i.e. phone, email, fax, SMS) with early warning authorities as well as information resource persons; append resource contact list; and be reviewed frequently and updated when necessary. (HINT: To develop an SOP, begin with BREAKING NEWS processes then adjust accordingly.)

Other broadcast EWS and SOP Considerations might include: 1) an “Organizational Chart” which has departments and/or personnel names and contacts who are responsible for early warning alerts; 2) a diagram of organization decision processes; 3) technical capabilities to receive and broadcast early warning messages; 4) a designated transmitter of information or a “provider of information”; understanding “the demographics” of the viewing or listening audience (i.e. broadcast area, languages, principal livelihoods, specific vulnerable groups within that viewing/listening audience, such as women, children, PWD, extremely impoverished, etc.; and understanding and complying with the public service obligations.

It cannot be expected, nor is it desired that the broadcast media re-word or translate alerts issued by early warning authorities. Thus it is incumbent upon early warning authorities to issue alerts in a manner that is clear, concise, and understood by the intended “end-audience” (those segments and locations of the populations for whom the alert was issued).

When a broadcast media outlet receives an early warning alert, there should be an immediate verification process to ensure that the alert was officially and accurately issued, before

broadcasting the alert. However, with 24-hour international news services and a plethora of sources official and unofficial, it is highly likely that news of a potential threat will be aired well-before any early warning authority has time to properly analyze data and issue an alert. Though the distinction may not be clear-cut, the “news” of a potential threat should be considered as news, while the early warning alert is official information. However, in the absence of a timely early warning alert verification, the broadcast media should broadcast the alert, perhaps with “qualifying language,” if the alert and the origin of the alert is deemed credible, or has been confirmed through reliable secondary sources, which may include other broadcast media outlets. The ability to broadcast information often out paces the ability to produce information that is based upon sound data and analysis.

The competitive nature of commercial/private broadcasters should be recognized. Though no broadcaster should reword or translate an early warning alert, many will want to “go beyond” the alert to provide additional information to their viewing or listening audience. Government early warning agencies should position itself to take advantage of the “journalistic zeal” of commercial/private broadcasters. For example, early warning or authorities should make more frequent use of “press conferences” when alerts are issued where the authority not only issues a statement, but fields questions from the media/press corps.

Many time people do not immediate act on first news of warning or alert even with sufficient lead time. Many chose to further clarify and assess their risk by waiting for, actively seeking, and filtering additional information. They don’t act until they receive and process additional, credible confirmation of the threat and its magnitude from a non-routine trigger such as: 1) physical observation of the environment (seeing the tornado approach); seeing or hearing confirmation of the threat on radio or television, seeing the large tornado on the air, or hearing on-air instructions to “take cover now”; hearing a second, non-routine, siren or radio/loudspeaker alert.

Radio broadcasting may be critical for early warning in the aftermath of a disaster for such things as rescue and relief. Radio would allow government emergency agencies to issue information, guidance, and advice to tens or hundreds of thousands of people affected by a natural disaster. Of course, the problem is obvious - the same coastal hazard that has just affected thousands, has probably negatively impacted electrical service and radio broadcasting capabilities. Stakeholders should identify the coastal areas of highest risk as well as the most vulnerable populations, and “correspond” them to the pre-eminent radio broadcasters that serve these “high risk - most vulnerable areas.” Stakeholders should explore methods to “reinforce” these broadcast facilities that are “too important to fail,” so that they can withstand the impact of the disaster, or possess the capability to be on the air again a few hours after the disaster.

6.5.4 Hydrological Insights into SOPs, Mr. Ahmed Said Al Barwani, Water Resources Expert, Ministry of Regional Municipalities and Water Resources, Oman. Mr. Barwani began with a description of hydrology as the science of water. It is the science that deals with the occurrence, circulation and distribution of water of the earth and earth’s atmosphere. A good understanding of the hydrologic processes is important for the assessment of the water resources, their management and conservation on global and regional scales. Floods occur most commonly when water from heavy rainfall, from melting ice and snow, or from a combination of these exceeds the carrying capacity of the river system, wadis, lake, or the

like into which it runs. It is important when considering floods warnings to in cooperate the whole catchment area from the mountains to the ocean or desert. Flood frequency is the likelihood that a large flood will happen and can be classified as a 100-year flood, flood that is exceeded, on average, once every 100 years but has probability of 1 per cent each year. Similarly with a 10-year flood with a probability of occurring 10 per cent ear year or a mean annual flood with a probability of 50 per cent.

He then described catchment's response to floods as a set of characteristics which determine the response of the catchment to rainfall and listed 10 to consider. These were: catchment area; soil type(s) and depth(s); vegetation cover; stream slopes and surface slopes; rock type(s) and area(s); drainage network (natural and man-made); lakes and reservoirs; impermeable areas (e.g. roads, buildings, etc.); rainfall (depth, duration and intensity); and evaporation potential (derived from temperature, humidity, wind speed and solar radiation measurements or from evaporation pan records). Mr. Barwani quickly reviewed the causes of floods and flood damage such as heavy rain; dam and levee failure; low absorption or no soil percolation; business and residential growth in flood areas. He then stated six of some of the challenges associated to better monitor and forecast flood conditions in Oman which included: identification of catchment area and it characteristics; monitoring networks –gauging stations availability; telemetry systems connecting rain and gauges stream (wadi gauges); historical data; data quality and data analysis; and selection of models for flood predictions. He emphasized the need for spatial digital data and maps and that these should include: digitized stream network data (evaluation/verification of delineation); digitized country catchment boundaries data (evaluation/verification of delineation); land-use and land-cover data (parameterization of hydrologic models); soils data to include soil texture or FAO soil classification or soil properties data (parameterization of hydrologic models); local stream cross-sectional survey data for streams draining 10-2000km² (estimation of threshold runoff); reports of regional relationships between channel cross-sectional characteristics and catchment characteristics; and population Distribution (if available).

As input data requirements for flash flood and flood models, he encouraged the use of:

- ▶ Reports such as flood frequency analysis (regional and local), flash flood occurrence (regional and local), stream geometry studies for small streams, and climatological precipitation and flood studies;
- ▶ Historical data such as precipitation data (hourly, daily, monthly, climatology), air temperature data (hourly, daily, monthly, climatology), pan evaporation data (daily, monthly, climatology), soil moisture data for top 1 meter of soil (weekly, monthly, climatology), stream flow discharge data for local streams with drainage areas less than 2000 km² (hourly, daily, monthly, climatology), spring discharge data, stream stage data (hourly, daily, monthly, climatology) and associated stage-discharge curves (rating curves), also for local streams, radiation data for computation of potential evapotranspiration (daily, monthly, climatology); wind, humidity data for computation of potential evapotranspiration (daily, monthly, climatology), radar data, once radars become operational and satellite data, and groundwater recharge rates and groundwater level data for surficial aquifers;
- ▶ Real time data such as surface precipitation and weather data (hourly and daily), radar data in mutually agreeable gridded format, satellite data in mutually agreeable formats, and river stage data; and
- ▶ Logistical data (metadata) such as longitude and latitude coordinates of all sensors providing real time data and historical data, type of data and sensor (geo-referencing of

data), longitude and latitude coordinates of dams and reservoirs (accounting for contributing area in threshold runoff estimation), evaluation of basin delineation: initial delineations based on hydrologic processing of the Shuttle Radar Topography Mission (90-m) resolution digital elevation data and hydrographic information from the digital chart of the world, evaluation of the delineation results with local knowledge and expertise is required for final quality assurance, and delineation maps may be provided in GIS format (ArcView shape files), or in image format (e.g., jpeg) for sub-regions within the delineated region.

7. Workshop Day 2 – 4 October 2013

7.1. Session 1: Mapping and Modeling the Storm Hazard.

This session contained two presentations, one on storm surge hazard mapping and one on storm surge modeling.

- ▶ Storm Surge Hazard Mapping, Mr. Edino Nonato Nolasco, Weather Facilities Specialist II, HTMIRDS/RDTD, PAGASA. Mr. Nolasco noted that the Hazard Mapping and Assessment for Effective Community-Based Disaster Risk Management or “READY” Project was formally launched on April 16, 2009 in the province of Iloilo. The READY Project is a collaborative effort of the Government of the Republic of the Philippines, the United Nations Development Program and the Government of Australia. The Office of the Civil Defense-National Disaster Coordinating Council is the implementing agency while the responsible agencies are the Philippine Institute of Volcanology and Seismology – Department of Science and Technology, Philippine Atmospheric, Geophysical, Astronomical and Services Administration, Mines and Geosciences Bureau – Department of Environment and Natural Resources and National Mapping Resource and Information Authority (NAMRIA-DENR). Cooperating partners are the Local Government Units and SMART Telecommunications.

The READY project aims to address the problem of Disaster Risk Management (DRM) at the local level by empowering the most vulnerable municipalities and cities in the country and enable them to prepare disaster risk management plans. The project hopes to develop a systematic approach to community based disaster risk management. Iloilo is one of the 27 high risk provinces covered by the project. There are three components of the project that carries a time frame from 2006-2011, namely, Multi-hazard Identification and Disaster Risk Assessment, Community-Based Disaster Preparedness, Initiate the Mainstreaming of risk Reduction into the Local Development Process.

The first component includes preparation of hazards mapping and assessment of possible disasters that may affect an area, while the second involves development of community-based Early Warning system and development of IEC strategies and materials. For the mainstreaming of risk reduction into local development planning, conduct of preparatory meetings, resource mobilization and donor coordination are undertaken. Initiatives toward a more effective disaster risk management have been a national priority after the occurrence of so many tragedies caused by natural hazards such as landslides and flash floods.

In Phase 2, the Project Enhancing Greater Metro Manila’s Institutional Capacities for Effective Disaster/Climate Risk Management towards Sustainable Development (also

known as GMMA READY Project) aims to decrease the vulnerability of the Greater Metro Manila Area (GMMA) to natural hazards and increase its resilience, by strengthening the institutional capacities of the local government units, concerned national government agencies, academic institutions and civil society organizations to manage disaster and climate change risks. The project is envisioned to achieve all the results over a period of three (3) years (2010 to 2013) and expected to improve mechanisms and protocols on DRM/CRM. The project covers Metro Manila and the provinces of Rizal and Bulacan.

Responsible Partners include Mines and Geosciences Bureau; National Mapping and Resource Information Authority; Office of Civil Defense; Philippine Atmospheric, Geosciences and Astronomical Services Administration; Philippine Institute of Volcanology and Seismology; Metro Manila Development Authority, Housing and Land Use Regulatory Board; Climate Change Commission, and National Economic Development Authority. Mr. Nolasco mentioned that Nestor Nimes had prepared and updated the “Historical Storm Surge in the Philippines (1897-2011)” in 2009 and 2011.

Mr. Nolasco commented that the Regional Training and Capacity Building on Storm Surge Modeling using JMA Storm Surge Model conducted last June 24-28, 2013 in Tokyo and hosted by ADPC was very beneficial. They were able to install the software using VMPlayer in a PC running Windows 7; installed the software in an old PC (formatted and installed only Ubuntu); gathered a few tropical cyclone data that might generate storm surge in the Philippines; and edited the script that will be used in the model. The problems encountered have been that the program runs slowly; after installing and running GrADA and GMT they encounter errors like “Permission denied” and “run time error”; and they still need to familiarize with the scripts and GrADS command. However, they are in constant communication with Mr. Kohno Nadao of JMA with regards to the problems we have encountered.

- Storm Surge Hazard Modeling, Mr. John Phillip Lapidez, Project NOAH, DOST. Mr. Lapidez stated that the JMA Storm Surge Model is a numerical model developed by the Japan Meteorological Agency to simulate and predict storm surges mainly caused by tropical cyclones. It is based upon on 2D shallow water equations and can be run on a common PC. The 3D version of the model requires much more computer capability and processing power. This model is free and available upon request. A written agreement between JMA is required to use the model for operational purpose.

The features of the model include: 1) computes storm surges due to wind setup and inverted barometer effect; 2) accepts two kinds of meteorological data as forcing: Gridded Binary (GRIB) format files and Best Track Data; 3) writes storm surge calculation results in GRIB format; and outputs time series of coastal points specified by user. The inputs required are either *Grib data or best track data and also bathymetry data*. The Storm surge model output is a storm surge map, time series, and inundation model. Mr. Lapidez provided an example of a simulation and then examples for Typhoon Imbudo and Typhoon Rananim.

7.2 Session 2: Bridging the Gaps in SOPs for Early Warning Systems – The Road Ahead.

During this session, the meeting participants were broken into three groups. They were asked to identify best practices, gaps and needs, and recommendations regarding the Philippines EWS and SOPs. This proved to be one of the most beneficial session of the workshop. Each group was given about 1 hour and 30 minutes to discuss among themselves and then to go back and brief the entire group on their ideas.

GROUP 1:

Strength	Gap	Recommendation:
PHIVOLCS has existing SOP for Tsunami. They have been tested and validated (several coastal areas in Philippines).	Need to validate the SOPs in all coastal areas. There is no SOP produced by local communities.	Need to disseminate and consult from the national down to local official Everybody should participate
PAGASA has an existing tropical cyclone SOP.	PAGASA has no existing SOP for storm surge The TC SOP does not cover back-up plans for catastrophic events.	The SOP needs to be revised to conform to recent development of the ICT and monitoring set-up. Formulate SOP for storm surge.
NOAH good for developed cities	Does not reach in barangay Define what NOAH is designed for. Where NOAH should be lodged? Coordination among the mandated agencies. Involvement of the mandated agencies in the development of model simulations, etc.	There has to be an agreement about the current and future roles and functions.
	Back-up plans for potential catastrophic events.	Develop SOPs for different scenarios.
Sufficient number of sea level monitoring stations among PHIVOLCS, NAMRIA and PAGASA.	There is no existing mechanism for data sharing.	Sharing of sea level data among PHIVOLCS, NAMRIA and PAGASA through a MOU.
Coastal risk assessment.	Information or findings are not yet translated into DRRM actions at the LGU levels.	SOPs on evacuation, sheltering and resettlement.
Media gives high priority to early warning information.	There is no one voice speaking for the government	There should be a MOU between the media and the NDRRMC. Conduct post disaster assessment between NDRRMC and the media.
Available critical infrastructure data base.	For LGUs to appreciate warnings. Most of the LGUs are not able to use DRRM planning Lack of standards on	Plans for sharing should be available to everyone.

	Problems in standardization data formats, warnings and monitoring systems.	Standardize data formats, warnings and monitoring systems through SOPs and MOUs.
The DILG has a strong relationship with the LGUs.		For other countries to learn from the existing laws on DRR and CC.

There was a great deal of discuss following Group 1 presentation.

In the area of tsunami, it was agreed that there were excellent SOPs at the national level and that they have been tested. It was believed that it would be a good idea to incorporate some of these into a coastal EWS system to be of added use. But there is a need to test these SOPs in all coastal areas, especially in the west. There was also a need identified that tsunami related SOPs could be very helpful at a local level and none of these have been done. It was recommended that SOP direction and guidance comes from the highest levels of government to mandate the need to disseminate, consult, and collaborate at all levels of government and mandate participation. One item to mandate is the testing for coastal hazards like tsunami and storm surge.

In the area of storm surge, several of the PAGASA staff have been trained and are running the NOAH model. But there are many questions on how to use these data, how to disseminate, and what role it will play. In addition, it was identified that there were no PAGASA SOPs for catastrophic events. There was additional discussions on ways to share data and more importantly data analysis to ensure a common, coordinated analysis (with MOUs as needed). Also included were ideas on procedures to share risk assessments and the need for evacuation SOPs based upon the coastal risk assessment. One major item is to ensure a single spokesman for the media which should include a high government person and technical people. There was also extensive discussions for the need of a standardized color alerting code and format, because it is sometime difficult to coordinate and collaborate at different levels using different color codes. It can also be confusing to the public at local levels. A possible coordinated MOU/MOA may be needed.

Suggestion for the SSOP Manual/Handbook included: include examples from other countries; provide baseline standard requirements; SOPs for different types of events and different levels of threat; protocols to use with different levels of government; a possible matrix – if you see this, then do that; trigger points of actions.

GROUP 2

Gaps

1. National Office of Civil Defense have SOPs but need to be reviewed
2. The Regional Offices of Civil Defense (OCDs) do not have SOPs. It was considered advisable to establish SOPs at this level.
3. Non-existence of Memorandum of Understanding between the Disaster Council and the media association. It was considered advisable to establish a MOU.

4. Lack of coordination on dissemination warnings between the national governmental agencies (i.e. PAGASA, OCD, DRRMCs) and the local governments.
5. Lack of efficiency and capacity of Telecommunication systems. Problems in the dissemination of warnings:
 - i. PAGASA sends the warnings to the local DRRMO's simultaneous to OCD national and local offices.
 - ii. SMS is not reliable during inclement weather
 - iii. No fax machines in some local government units and barangays
 - iv. Lack of back-up system
 - v. The use of radio is the best
6. Transmission of warnings - Simplification of the warning information is considered necessary

The discussion following this group's presentation presented clarifications and insights. For example, number one seemed to focus not on all OCD's SOPs, but only those that pertain to operations center respond/procedures during a disaster. The second item concerning region OCD lack of SOPs was especially in cases of heavy rainfall which can be confusing, but again it was pointed out that regional OCD offices have reasonable SOPs, but they need to be updated based on past experience. Number 3 is similar to the one from Group 1. But again for clarification, it was stated that there was a broadcasters manual, but it needed to be updated and the idea of a MOU between the media and OCD needs to be revived and updated. The misunderstanding caused by international news organization relaying information, sometimes contrary to the official information, faster than the official warning offices was mentioned as a problem. For item 4, it was clarified that many thought that there was communications to a local level throughout the onset of events and hourly for longer forecasted events. But it was mentioned that there were extreme demands on local commentators so warnings and information are needed faster with given responses and prevent any bottlenecks which may exist which would interfere with this. This was a suggestion that a hotline might be needed between OCD and PAGASA and the idea of an integrated multi-hazard EWS might help communications at different levels.

A major part of the discussion focused on coordination and dissemination of warnings. Many believed SMS and fax were not reliable methods of transmission in a disaster situation, however radio is a very good method but some improvements are needed there. There was discussion that PAGASA and OCD previously owned their own radio station, broadcasts had ended, but they still owned the frequency. An idea was voiced that they could possible get a new system for emergency radio transmission purposes, however there is no official position on who would transmit. It was mentioned that the USA has NOAA weather radio for emergency weather broadcasts which is almost completely automated. This is something that can be researched.

It was mentioned that PAGASA and OCD blast SMS to 100s of uses, and sometimes they are different messages, but originated from the same source. There was agreement that SMS by page needed to be reviewed and review the need to only use SMS for really important items.

There was additional discussion on operational flexibility during regular typhoons and heavy rain situations. There are two different operating centers which sometimes provide different information.

GROUP 3

Strengths

- good regulatory framework to create and maintain linkages amongst the various agencies and levels of government
- in urban areas good cooperation from local authorities to institute regulation and ordinances dealing with DRR and EW
- urban warning, communication and preparation generally good
- typhoon signals for landfall in certain areas
- good dissemination to OCD
- 24 hours before landfall conduct press conference, special holding area for media, some media stay 24/7
- local government and CBDRRMS (barangay captain, or barangay disaster coordinator)
- CBDRRMs, first aid, water emergency lifesaving training – emphasize those areas most at risk- volunteers
- school students – coordination with school disaster coordinator/boys and girls scouts (emergency first responder), earthquake drills. Students involved in taking observations with assigned SOPs
- media and teacher training, nationwide
- community flood drills

Challenges

- encouragement of permanent placement of color coded flood level markers, accompanied by a local type of alarm when water reached certain levels for the people to take certain actions (i.e., prepare, most vulnerable evacuation, general evacuation). Simplification of the warning information is considered necessary
- potential turnover of LGUs due to elections
- for some remote communities communications is difficult or problem with security (i.e., some areas of Mindanao). Must travel by horse to reach.
- difficult to convince Mindanao communities to prepare because of long history of no typhoons
- personal resistance to preventive evacuations (unrealistic expectation that relief assistance delivered to the house as opposed to centers)
- lack of good evacuation facilities some areas there is inappropriate placing of evacuation centers, poor planning
- incomplete understanding of hazard maps at local level and how to transfer this information effectively to the people

There was discussion that sometime in some situations, one must try to influence the leader or the person in power that some of these issues can be important to their people. Also may get other LGU leaders to influence these areas and to emphasize the multi-hazard nature of the approach. So it could be good for many different items. One person commented that at the local level, people want to see structures or infrastructure development and not just words and plans.

As with one of the previous groups, group 3 had several recommendations related to the proposed Manual/Handbook. These included incorporating previous examples, development process, the framework, processing and updating process, incorporation of decision points and trigger points based upon experience.

7.3 Session 3: Challenges to issue effective, understandable forecasts, advisories, and tropical cyclone bulletins.

PAGASA made a presentation on the first Simplification Writing Workshop they held on September 7, 2010 and then an updated they held a few days before the workshop on September 27, 2013 at the Amihan Conference Room, PAGASA Science Garden. It was attended by representatives from the media, academe and technical and information officers of PAGASA. This meeting was a result of a directive from President Aquino on August 22, 2013 while visiting Maring-affected areas. President Aquino reminded the weather bureau Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) to use simpler language in its weather bulletins to make them understandable to more Filipinos. He requested PAGASA to avoid using technical terms that may only confuse people. He cited as an example "millimeters" which is a term the weather bureau uses to describe the amount of rainfall a given weather disturbance carries. He suggested that this needs to be simplified. PAGASA has also been receiving comments via Facebook and other electronic media from the public/end-users on recommendations/ideas to simply their bulletins.

There were several recommendations to simplify the weather advisories are for broadcasting/reporting purposes so that the general public can more easily understand them had come from this workshop. One of these recommendations was for the weather bulletin for the website to be detailed in conformity with the WMO standards, while the weather bulletin for broadcast reporting can be simplified with less technical terms




Also there were discussions are things to consider:

- Profile of end-users – Although Filipino people are generally familiar with technical terms, the target users for the simplified bulletins are from the grassroots level or what we call the “masa”.
- Since majority of end-users of the weather advisories are from the grassroots or the “masa”, it was suggested to interchange the English and Filipino forecast. The Filipino version will come first, then English.

Identified issues/Predicaments of PAGASA	Proposed Solution
1. Technical terms that cannot be translated to Filipino (e.g., Cold Front)	1. Stick to the English term

2. Conversion of rainfall amount to a more generic metrics system (e.g., millimeter to a bottle of water).	2. Craft a feasible metrics system that is generally familiar to the public, such as a drum of water/8oz. of water.
3. Wordy and redundant weather bulletins (e.g., "maulapnakalangitan" or cloudyskies).	3. Do not state the obvious. Clouds are in the sky. Be concise and direct to the point.
4. Choice of words ("inaasahan" or "expecting")	4. The word "inaasahan" connotes a positive tone. Just use "pinangangambahan"

The group agreed that the Heavy Rainfall Warning levels used contained too many terms such as warnings, advisory, alert, action, awareness, preparedness, etc. The group agreed that it is quite confusing. Therefore the following was suggested.

HEAVY RAINFALL WARNING LEVELS	
RAINFALL VALUES (mm) FOR METRO MANILA	MEANING
<p>YELLOW RAINFALL ADVISORY</p> <p>Rainfall of 7.5 to 15 mm per hour has fallen or expected to fall and most likely to continue for the next 3 hours.</p>	 <p>Community AWARENESS FLOODING is POSSIBLE in low-lying areas and near river channels</p>
<p>ORANGE RAINFALL ADVISORY</p> <p>Rainfall of more than 15mm up to 30mm within 1 hour has fallen or expected to fall or if continuous rainfall for the past 3 hours is more than 45mm to 65mm and most likely to continue for the next 3 hours.</p>	 <p>Community PREPAREDNESS FLOODING is THREATENING in low-lying areas and near river channels</p>
<p>RED RAINFALL WARNING</p> <p>Rainfall of more than 30mm within 1 hour has fallen or expected to fall or if continuous rainfall for the past 3 hours is more than 65mm and most likely to continue for the next 3 hours.</p>	 <p>Community RESPONSE SEVERE FLOODING is EXPECTED Take necessary precautionary measures</p>

Disclaimer: Rainfall threshold values are arbitrary and may vary depending on the area of concern.

Other recommendations included:

- Do not aim for literacy writing / award-winning weather bulletins. The general public will easily understand a conversational-type of reporting. Aim for a clear communication of information.
- The effects or corresponding hazards should be emphasized, not the technical terms such as millimeters, amount of rainfall.
- Essential impacts of the storm signals should be understand a conversational-type of reporting. Aim for a clear communication of information.
- Forecasters/technical people should undergo a regular writing and communications training so that they can also relate well with the media and go beyond being technical.

- Warnings and bulletin should be in a near final state where the media can “rip and read” them.

7.4 Session 4. Building Relationships.

Due to time constraints of the meeting and also because of the evident strong relationships of the various key members of the EWS and their regular coordination meeting, it was felt that this session was not needed and was not discussed.

7.5 Session 5. Setting Goals and Completion Dates.

The group agreed that the first draft of this report and discussion would be available by November 15, 2013 so it could be discussed at the PTC IWS at the end of November and the TC 8th IWS/2nd TRCG form in early December and then would be edited and finalized at a later day.

Mr. Weyman also informed the group that there would be four reports done, one for each of the pilot countries and then a shorter combined report of all of the visits containing only the high level information.

8. Summary of Strengths, Gaps, Needs, and Recommendations

The In-Country Pilot team would like to thank all of the participants and local organizing committee, especially Dr. Malano, Dr. Espinueva, and all of the other members, for the excellent workshop. Everyone was very gracious and provided valuable assistance during our visit. Also it was very evident that all participants cared deeply to serve their people and fully dedicated to improving the quality of life through the protection of life and property in hazardous situations. The Philippine government and people are very fortunate to have such a talented group working for them.

8.1 Strengths.

During the course of the workshop, many strengths were identified which will help determine some of the best practices for this project. Some of these were SOP-related and some were not related to SOPs directly, but were kept as part of an overall needs analysis in this area. These included:

SOP Related

- a. Philippine Institute of Volcanology and Seismology (PHIVOLCS) has existing SOP for Tsunami. They have been tested and validated (several coastal areas in Philippines).
- b. Media gives high priority to early warning information.
- c. The Department of Interior and Local Government has a strong relationship with the Local Government Units. Recommendation: For other countries to learn from the existing laws on DRR and CC.
- d. There exists a good regulatory framework to create and maintain linkages amongst the various agencies and levels of government.
- e. In urban areas, there is good cooperation from local authorities to institute regulation and ordinances dealing with DRR and EW

- f. Urban warning, communication and preparation are generally good
- g. There are standard typhoon signals for landfall in certain areas
- h. Information is dissemination well to OCD
- i. PAGASA conducts 24 hours before landfall, a press conference, then creates a special holding area for media, some media stay 24/7.
- j. CBDRMs, first aid, water emergency lifesaving training is emphasize at those areas most at risk and volunteers are used
- k. Community flood drills are conducted.

Non-SOP Related

- a. PAGASA has an existing tropical cyclone SOP.
- b. NOAA (storm surge model) is good for developed cities.
- c. There are sufficient number of sea level monitoring stations among PHIVOLCS, NAMRIA and PAGASA.
- d. Coastal risk assessment has been done.
- e. There is a critical infrastructure data base.
- f. In schools, students practice earthquake drills and there is coordination with school disaster coordinator/boys and girls scouts (emergency first responder) for earthquake drills. Students involved in taking observations with assigned SOPs.
- g. Media and teacher training is provided nationwide.

8.2 Gaps, Needs, and Recommendations.

Since there were three different groups. Each developed their own lists and formats, so the following will try to capture the essence of each. Some of these were SOP-related and some were not related to SOPs directly, but were kept as part of an overall needs analysis in this area.

One overall recommendation was that SOP direction and guidance comes from the highest levels of government to mandate the need to disseminate, consult, and collaborate at all levels of government and mandate participation. One item to mandate is the testing for coastal hazards like tsunami and storm surge.

Gaps and Needs

SOP Related

- a. Need to validate the SOPs in all coastal areas. There are no SOPs produced by communities. Recommendation: Need to disseminate and consult from the national down to local official with everybody participating. In the follow up discussion, in the area of tsunami, it was agreed that there were excellent SOPs at the national level and that they have been tested. It was believed that it would be a good idea to incorporate some of these into a coastal EWS system to be of added use. But there is a need to test these SOPs in all coastal areas, especially in the west. There was also a need identified that tsunami related SOPs could be very helpful at a local level and none of these have been done.
- b. PAGASA has no existing SOPs for storm surge. Recommendation: The SOP needs to be revised to conform to recent development of the ICT and monitoring set-up. Formulate SOP for storm surge. Background: In the area of storm surge, several of the PAGASA

- staff have been trained and are running the NOAH model. But there are many questions on how to use these data, how to disseminate, and what role it will play.
- c. The TC SOP does not cover back-up plans for catastrophic events.
 - d. Backup plans and SOPs for potential catastrophic events are needed. Recommendation: Develop SOPs for different scenarios.
 - e. There is no mechanism for data sharing. Recommendation: Sharing of sea level data among PHIVOLCS, NAMRIA and PAGASA through a MOU. There was additional discussions on ways to share data and more importantly data analysis to ensure a common, coordinated analysis (with MOUs as needed). People can go to websites to view data but it is cumbersome and slow.
 - f. Information or findings are not yet translated into DRRM actions at the LGU levels. Recommendation: SOPs on evacuation, sheltering, and resettlement.
 - g. There is no one voice for the government. Recommendation: There should be a MOU between the media and the NDRRMC. Conduct post disaster assessment between NDRRMC and the media. Also it has been found useful to a high government person be the spoke person and then have and technical people as support.
 - h. Most of the LGU are not able to use DRRM planning. There is a lack of standards on these. Recommendation: Plan for sharing should be available to everyone.
 - i. Identified problems in standardization data formats, warnings, and monitoring systems. Recommendation: Standardize data formats, warnings and monitoring systems through SOPs and MOUs. There was also extensive discussions for the need of a standardized color alerting code and format, because it is sometime difficult to coordinate and collaborate at different levels using different color codes. It can also be confusing to the public at local levels. A possible coordinated MOU/MOA may be needed.
 - j. National Office of Civil Defense have SOPs but need to be reviewed. Discussion: Following this group's presentation, clarifications and insights were made. For example, number one seemed to focus not on all OCD's SOPs, but only those that pertain to operations center respond/procedures during a disaster.
 - k. The Regional Offices of Civil Defense (OCDs) do not have SOPs. It was considered advisable to establish SOPs at this level. Discussion: It was pointed out that concerning region OCD lack of SOPs was especially in cases of heavy rainfall which can be confusing, but again it was pointed out that regional OCD offices have reasonable SOPs, but they need to be updated based on past experience.
 - l. Non-existence of Memorandum of Understanding between the Disaster Council and the media association. It was considered advisable to establish a MOU. Discussion: This was identified as similar to the one from Group 1 above. But again for clarification, it was stated that there was a broadcasters manual, but it needed to be updated and the idea of a MOU between the media and OCD needs to be revived and updated. The misunderstanding caused by international news organization relaying information, sometimes contrary to the official information, faster than the official warning offices was mentioned as a problem.
 - m. Lack of coordination on dissemination warnings between the national governmental agencies (i.e. PAGASA, OCD, DRRMCs) and the local governments. Discussion: It was clarified that many thought that there was communications to a local level throughout the onset of events and hourly for longer forecasted events. But it was mentioned that there were extreme demands on local commentators so warnings and information are needed faster with given responses and prevent any bottlenecks which may exist which would interfere with this. This was a suggestion that a hotline might be needed between OCD

and PAGASA and the idea of an integrated multi-hazard EWS might help communications at different levels.

- n. Lack of efficiency and capacity of Telecommunication systems. Problems in the dissemination of warnings:
- PAGASA sends the warnings to the local DRRMO's simultaneous to OCD national and local offices.
 - SMS is not reliable during inclement weather
 - No fax machines in some local government units and barangays
 - Lack of back-up system
 - The use of radio is the best
 - Lack of efficiency and capacity of Telecommunication systems. Problems in the dissemination of warnings:

A major part of the discussion focused on coordination and dissemination of warnings. Many believed SMS and fax were not reliable methods of transmission in a disaster situation, however radio is a very good method but some improvements are needed there. There was discussion that PAGASA and OCD previously owned their own radio station, broadcasts had ended, but they still owned the frequency. An idea was voiced that they could possibly get a new system for emergency radio transmission purposes, however there is no official position on who would transmit. It was mentioned that the USA has NOAA weather radio for emergency weather broadcasts which is almost completely automated. This is something that can be researched.

It was mentioned that PAGASA and OCD blast SMS to 100s of uses, and sometimes they are different messages, but originated from the same source. There was agreement that SMS by page needed to be reviewed and review the need to only use SMS for really important items.

- t. Simplification of the warning information is considered necessary. In discussion, on ways to improve the products, several recommendations were made:
- Profile of end-users – Although Filipino people are generally familiar with technical terms, the target users for the simplified bulletins are from the grassroots level or what we call the “masa”.
 - Since majority of end-users of the weather advisories are from the grassroots or the “masa”, it was suggested to interchange the English and Filipino forecast. The Filipino version will come first, then English.
 - The group agreed that the Heavy Rainfall Warning levels used contained too many terms such as warnings, advisory, alert, action, awareness, preparedness, etc. The group agreed that it is quite confusing.
 - Do not aim for literacy writing / award-winning weather bulletins. The general public will easily understand a conversational-type of reporting. Aim for a clear communication of information.
 - The effects or corresponding hazards should be emphasized, not the technical terms such as millimeters, amount of rainfall.
 - Essential impacts of the storm signals should be understood a conversational-type of reporting. Aim for a clear communication of information.
 - Forecasters/technical people should undergo a regular writing and communications training so that they can also relate well with the media and go beyond being technical.
 - Warnings and bulletin should be in a near final state where the media can “rip and read” them.

- There was a great deal of discussion for encouragement of permanent placement of color coded flood level markers, accompanied by a local type of alarm when water reached certain levels for the people to take certain actions (i.e., prepare, most vulnerable evacuation, general evacuation). Simplification of the warning information is considered necessary

NON-SOP Related

- a. For the NOAH storm surge model, it does not reach in barangay. Need to define what NOAH is designed for. Where NOAH should be lodged? Recommendation: There has to be an agreement about the current and future roles and functions on NOAH.
- b. Involvement of the mandated agencies in the development of model simulations, etc.
- c. Find methods for LGUs to appreciate warnings. Recommendation: Stage discussion sessions with LGUs.
- d. Lack of good evacuation facilities in some areas and there are inappropriate placing of evacuation centers due to poor planning in others.
- e. Incomplete understanding of hazard maps at local level and how to transfer this information effectively to the people.
- f. Potential turnover of LGUs due to elections is a challenge
- g. For some remote communities, communications is difficult or problem with security (i.e., some areas of Mindanao). Must travel by horse to reach.
- h. Difficult to convince Mindanao communities to prepare because of long history of no typhoons.
- i. Personal resistance to preventive evacuations (unrealistic expectation that relief assistance delivered to the house as opposed to centers)

Recommendations for the SSOP Manual/Handbook.

It was recommended that it: include examples from other countries; provide baseline standard requirements; SOPs for different types of events and different levels of threat; protocols to use with different levels of government; a possible matrix – if you see this, then do that; and trigger points of actions.

Appendix I - Pilot Workshop on SSOP 3 – 4 October 2013 Philippines Programme**Pilot Workshop on Synergized Standard Operating Procedures (SSOP) for Coastal Multi-hazards Early Warning System****3 – 4 October 2013****Amihan Conference Room, PAGASA Science Garden, Quezon City, Philippines****PROGRAMME**

DAY 1: 3 October 2013 (Thursday)		
8:00AM – 9:00AM	Registration	
9:00AM – 9:15AM	National Anthem/Doxology	Dr. Vicente B. Malano, OIC, PAGASA
	Welcome Remarks	
	Message	
Session 1: Roles and Responsibilities in Coastal Multi-hazards Early Warning System at the national, district, and local levels		
9:15AM – 9:30AM	Workshop orientation, objectives, and goals	Mr. James Weyman, Project Manager/ Technical Advisor SSOP
9:30AM – 9:45AM	Hydro-meteorological services	Mr. Roberto S. Sawi OIC, Weather Division, PAGASA
9:45AM – 10:00AM	Disaster Management	Mr. Edgardo Ollet, Regional Director OCD NCR
10:00AM – 10:15AM	Media	Helen Flores Reporter, Philippine Star
<i>Break</i>		
10:30AM – 10:45AM	Elected Officials	Mr. Roland Galicia OIC, Taguig DRRMO
10:45AM – 11:00AM	Others related fields	Dr. Renato Solidum Jr. Director PHIVOLCS
Session 2: Identification of Issues, Gaps, and Challenges in Early Warning System		
11:00AM – 12:00 NN	Group discussion	Mr. James Weyman Moderator
<i>Lunch break</i>		
Session 3: Role of Standard Operating Procedures		
1:15PM – 1:30PM	Introduction and review	Mr. James Weyman

1:15PM – 1:30PM	Hydro-meteorological services	Dr. Susan R. Espinueva Chief, HMD, PAGASA
1:45PM – 2:00PM	Disaster Management	Mr. Edgar Allan Tabell OIC, Exec Dir Patrol 119 DILG
2:00PM – 2:15PM	Media	Ms. Girlie Bangonan Chief, ROD PIA
2:15PM – 2:30PM	Elected officials	Mr. Ranulfo Ludovica Councilor, Quezon City
2:30PM – 2:45PM	Related Fields	Dr. Renato Solidum Jr. Director, PHIVOLCS
Session 4: Identification of Issues, Gaps, and Challenges for Early Warning System Standard Operating Procedures		
	Group discussion	Mr. James Weyman Moderator
Break		
Session 5: Plans and Thoughts for the Future		
3:20PM – 3:35PM	Meteorological Insight into SOPs	Mr. Olavo Rasquinho Secretary, Typhoon Committee
3:35PM – 3:50PM	Disaster Management Insight into SOPs	Mr. Atiq Kainan Ahmed Programme Specialist, ADPC
3:50PM – 4:05PM	Media Insight into SOPs	Mr. Walter Welz ABU
4:05PM – 4:20PM	Hydrological Insights into SOPs	Mr. Ahmed Said Al Barwani, Water Resources Expert, MRMWR, Oman
6:00 PM	DINNER Ms. Venus R. Valdemoro, Master of Ceremony	

DAY 2: 4 October 2013 (Friday)		
8:00AM – 8:30AM	Registration	
Session 1: Mapping and Modelling the Storm Surge Hazard		
8:30AM – 8:45AM	Storm Surge Hazard Mapping	Mr. Dino Nolasco, Weather Specialist II, PAGASA
8:45AM – 9:00AM	Storm Surge Hazard Modelling	Representative, NOAH Project
Session 2: Bridging the Gaps in SOPs for Early Warning System - The Road Ahead		
9:00AM – 9:45AM	Group Discussion	Mr. James Weyman Moderator
9:45AM – 10:30AM	Initial steps to fill the gaps and meet the challenges of SOPs for EWS	Breakout Groups
Break		

10:45AM – 12:00NN	Groups Report on Action Plan for improvements	Mr. James Weyman Moderator
<i>Lunch</i>		
<i>Session 3: Challenge to issue effective, understandable forecasts, advisories, and tropical cyclone bulletins</i>		
1:15PM – 1:45PM	Group Discussions: What are the warning/advisory needs of?	
1:45PM – 2:30PM	Group Discussion: How to make weather/tsunami bulletins effective, understandable, and public-friendly?	
2:30PM – 2:45PM	Action Plan for improvements	
<i>Session 4: Building Relationships</i>		
2:45PM – 3:00PM	Importance of Relationships among members involved in the Early Warning System	
<i>Break</i>		
3:20PM – 3:35PM	How to build, foster, and maintain relationships among Early Warning System participants	
3:35PM – 3:50PM	Future plans for developing and maintaining relationships	
<i>Session 5: Setting Goals and Completion Dates</i>		
3:50PM – 4:10PM	Setting an operational strategy for the future – taking the theory into practice.	
4:10PM – 4:45PM	Workshop Summary and documenting goals and completion dates	
4:45PM – 5:00PM	Closing Message	Mr. James Weyman Project Manager, Technical Advisor SSOP
	Closing Remarks	Dr. Cynthia P. Celebre Chief, Research and Development & Training Division, PAGASA
Ms. Venus R. Valdemoro, Master of Ceremony		

Appendix II - Pilot Workshop on SSOP 3 – 4 October 2013 Philippines Attendees

Pilot Workshop on Synergized Standard Operating Procedure (SSOP)
for Coastal Multi-hazards Early Warning System

Philippines
3-4 October 2013

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Pilot Workshop on Synergized Standard Operating Procedure (SSOP)
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Philippines
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Pilot Workshop on Synergized Standard Operating Procedure (SSOP)
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Pilot Workshop on Synergized Standard Operating Procedure (SSOP)
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Pilot Workshop on Synergized Standard Operating Procedure (SSOP)
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