

Outline of the talk

- Practical experiences of Cyclone Simulation from Myanmar
- Practical experiences of Tsunami Simulation from Sri Lanka
- Key elements and lessons from the of end-to-end simulation on the ground

1.

**Practical experiences from
Myanmar: Cyclone simulation**

ပပြင်ထောင်စုသမ္မတမန္တိမာနိုင်ငံတော်အစိုးရ
ပိုဆောင်ရေးဝန်ကြီးဌာန
မိုးလေဝသနှင့်လေဗဒ္ဓညွှန်ကြားမှုဦးစီးဌာန
နပပြင်တော်

ဘဏ္ဍာပင်လယ်အော်အခြေအနေ

(၂၀၁၄ ခုနှစ်၊ မေလ(၅)ရက်နေ့ မန္တိမာစံတော်ချိန်(၁၀:၀၀)နာရီအချိန်ထုတ်ပြန်ချက်)

ယနေ့မန္တိမာစံတော်ချိန် (၀၉:၃၀)နာရီအချိန် တိုင်းထွာချက်များအရ ဘဏ္ဍာပင်လယ်အော် အရှေ့တောင်ပိုင်းတွင် လေဖိအားနည်းရပ်ဝန်းတစ်ခု ဖြစ်ပေါ်နေပါသည်။ အဆိုပါလေဖိအားနည်း ရပ်ဝန်းသည် နောက်(၂၄)နာရီအတွင်း ပိုမိုအားကောင်းလာနိုင်ပြီး မုန်တိုင်းငယ်တစ်ခုအဖြစ်သို့ ရောက်ရှိနိုင်သည်ဟု ခန့်မှန်းရပါသည်။

Bay Bulletin

(Issued at (10:00) hours MST on 5-5-2014)

According to the observations at (09:30) hrs M.S.T today, the low pressure area has formed over Southeast Bay of Bengal. It is forecast to intensify further into a depression during next (24) hours.

Formulation of the dummy warning messages for cyclone “Rabbit”

Bay bulletin

Formation of LPA

Cyclone Warning (Orange)

Cyclone warning (Red/Emergency)

Cyclone news (after crossing)

Cyclone Warning

Issued at (11:00) hours MST on (5- 5-2014)

According to the observations at (10:30) hrs M.S.T today, Cyclonic Storm (RABBIT) over West central Bay of Bengal has moved to the Northeast direction and centered at about (150)miles West-Southwest of Pathein and (200)miles West of Phyarpon and (230)miles West-Southwest of Yangon. It is forecast to move Northeast wards and storm center likely to cross deltaic area near Hvgyi Kyun (Myanmar) next (12)hrs commencing noon today.

Current stage of cyclonic storm (RABBIT) is coded as Red emergency color, it means cyclone is moving towards Myanmar coasts.

Maximum wind speed is estimated to be (60)mph, gusting (70)mph during landfall time. And probable maximum storm surge of about (4)to (6)feet in Chaungtha, Pathein district and (6) to (8)feet in along Phyarpon coast. Isolated heavyfall are likely in Mandalay, Magway, Bago, Yangon and Ayeyarwady Regions and Rakhine States.

Frequent squalls with rough sea will be experienced Deltaic, Gulf of Mottama, off and along Mon-Taninthayi Coasts. Surface wind speed in squalls may reach (60-70)mph. All fishing boats, ships and vessels are advised to remain for safety.

Warning transmission from National to Regional office



Village Tract Disaster Management Committee (VTDMC) receives the warning through cell phone and VHF radio



Receives the hardcopy.....





Elevated warning with evacuation notification comes from the National to Regional and then gets transmitted to VTDMCs

VTDMC meets and decides for needed action



Discusses the evacuation plan using the pre-prepared 'evacuation map' and clusters and routes identified for systematic evacuation



Decides to make a public announcement and issues evacuation notification to the villagers using PAS setup



Door to door warning message reaches through megaphones, loud speakers and cell phones



Demonstrative evacuation takes place to the safer sites



Community is briefed to create awareness and learning



Observer team shares their experiences and analyzes the strengths, weaknesses and lessons



2.

Practical experiences of Tsunami
Simulation: Sri Lanka

National End-to-End Tsunami Simulation Exercise - 2013

Kalkudah, Eastern Province, Sri Lanka
12 Dec., 2013



Implemented by: Disaster Management Centre, Sri Lanka and Asian Disaster Preparedness Center, Thailand.
Supported by: UNESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness.

ජාතික සුනාමි පූර්ව අනතුරු ඇඟවීමේ මධ්‍යස්ථානය- කාලගුණ විද්‍යා දෙපාර්තමේන්තුව
 ISSUED BY THE NATIONAL TSUNAMI EARLY WARNING CENTER-
 DEPARTMENT OF METEOROLOGY
 வளிமண்டலவியல் திணைக்களத்தில் தேசிய சனாமி முன்னெச்சரிக்கை
 மையத்தனால் வழங்கப்பட்டது

සුනාමි අනතුරු ඇඟවීම නිවේදනය
 TSUNAMI WARNING BULLETIN
 கனம் எச்சரிக்கை அறிக்கை

Issued at: 03.00pm Thursday 12 December 2013

ශ්‍රී ලංකාවේ වෙරළබඩ ප්‍රදේශ වල සහ ඒ ආසන්නයේ, විශේෂයෙන් නැගෙනහිර සහ දකුණු වෙරළබඩ ප්‍රදේශ වල ජීවත් වන ජනතාව වෙතයි.

இலங்கையின் கரையோரப் பகுதிகளிலும் இதனை அண்டிய பகுதிகளிலும் வாழ்கின்ற மக்களுக்கும் குறிப்பாக கிழக்கு, தெற்கு கரையோரப்பகுதி மக்களுக்கும் ஆகும்.

TO: PEOPLES THOSE WHO ARE LIVING NEAR AND ALONG THE COAST AROUND THE ISLAND, PARTICULARLY IN THE EASTERN AND SOUTHERN REGIONS.

අන්දියාහු සාගරයේ සුමාත්‍රා දිවයින අසල මේ සමඟ දක්වා ඇති මූලික පරාමිතීන් සහිත භූ වලනයක් ඇති විය

An Earthquake has occurred near Sumatra Island in the Indian Ocean with these preliminary parameters.

இந்து சமுத்திரத்தில் சுமாதிரா தீவிற்கு அருகாமையில் கீழ் குறிப்பிட்ட ஆரம்பத்தரவுகளுடன் கூடிய பூமி அதிர்வு ஏற்பட்டுள்ளது.

ප්‍රබලත්වය (රිච්ටර් මාපාංක) : පරිමාණ (රිච්ටර් මාපාංක) Magnitude (Richter scale):	8.4
ලැඹුර (කි.මී): ஆழம் (கி.மீ) Depth (Km):	35km
දිනය திகதி Date:	2013.12.12
භවිතත් වේලාව: இடம்பெற்ற நேரம் Origin Time:	02.55pm
අක්ෂාංශ: தெடுக்கோடு Latitude:	02.0N
දේශාංශ: அகலக்கோடு Longitude:	95.5E
පිහිටීම : இடம்பெற்ற இடம் Location:	1800km Southeast of Batticaloa

RECEIVED
 Date: 12/12/2013
 Time: 03:03:00

Messages 1: Warning Bulletin

Messages 2: Advised to Evacuate

ආරක්ෂිත ප්‍රදේශ කරා ඉවත්වන ලෙසට කෙරෙන අවවාදය

පාඨුකාපාභාන ශ්‍රී ලංකාවට මුහුදුබඩ ප්‍රදේශ කරා ද බලපාන බැවින්, ශ්‍රී ලංකාවේ වෙරළබඩ ප්‍රදේශ වල සහ ඒ ආසන්නයේ, විශේෂයෙන් නැගෙනහිර සහ දකුණු වෙරළබඩ ප්‍රදේශ වල ජීවත් වන ජනතාව හැකි ඉක්මනින් ආරක්ෂිත ස්ථාන කරා ඉවත්වන ලෙස අවවාද කරනු ලැබේ.

Advised to Evacuate to Safe Places


මෙම භූ විලනය හේතුවෙන් සයුර සිසාරා විනාශකාරී සුනාමි තත්වයක් හටගැනීමේ හැකියාවක් පවතින අතර එසේ වුවහොත් එය ශ්‍රී ලංකාවේ වෙරළබඩ ප්‍රදේශ කරා ද බලපාන බැවින්, ශ්‍රී ලංකාවේ වෙරළබඩ ප්‍රදේශ වල සහ ඒ ආසන්නයේ, විශේෂයෙන් නැගෙනහිර සහ දකුණු වෙරළබඩ ප්‍රදේශ වල ජීවත් වන ජනතාව හැකි ඉක්මනින් ආරක්ෂිත ස්ථාන කරා ඉවත්වන ලෙස අවවාද කරනු ලැබේ.

මෙම නිවේදනය අදාළ ජාතික සහ අන්තර් ජාතික ආයතන සමඟ එකඟත්වයෙන් නිකුත් කරන ලද බැව් දන්වා සිටිමු.

ඉරට්ටුකාපාභාන ප්‍රදේශයේ මෙහි ප්‍රමුඛතර්ථයේ පාඨුකාපාභාන ඉරට්ටුකාපාභාන ආසාදිත උණුසුම් ජලයක් වැඩි වීම හේතු වනු ඇතැයි සිතනු ලබන බැවින්, මෙහිදී ඉහත සඳහන් කර ඇති ප්‍රදේශවල ජනතාවට ඉවත්වීමට අනුමැතිය ලබා දෙනු ලැබේ. මෙහිදී ඉහත සඳහන් කර ඇති ප්‍රදේශවල ජනතාවට ඉවත්වීමට අනුමැතිය ලබා දෙනු ලැබේ. මෙහිදී ඉහත සඳහන් කර ඇති ප්‍රදේශවල ජනතාවට ඉවත්වීමට අනුමැතිය ලබා දෙනු ලැබේ.

There is a possibility of a destructive ocean-wide tsunami in the Indian ocean that will affect Sri Lanka, those living near and along the coast around the island, particularly in the Eastern and Southern regions are advised to evacuate to safe places immediately.

This announcement to evacuate is issued in consultation with relevant national and international authorities.


Duty Meteorologist,
National Tsunami Early Warning Center,
Department of Meteorology,
Bauddhaloka Mawatha,
Colombo-07.

12/12/2013 15:17 pm 
DISASTER MANAGEMENT CENTRE

Messages 3: Cancellation

12/12 2013 15:46 FAX

Test/Test/Test

Color: Green

Bulletin Number 03

001

ජාතික තsunami අවදානම අවම කිරීමේ මධ්‍යස්ථානය - කොළඹ විද්‍යා මධ්‍යස්ථානයේදී
ISSUED BY THE NATIONAL TSUNAMI EARLY WARNING CENTER-
DEPARTMENT OF METEOROLOGY
කොළඹ, බාදාහලොක මාවත, ත්‍රිකුණාමලය, ශ්‍රී ලංකාව. කොටු මාර්ග 07
කොළඹ-07


අවදානම අවම කිරීමේ මධ්‍යස්ථානය විසින් 2013/12/12 දින 03.00 පමණ
TSUNAMI WARNING WITHDRAWAL / CANCELLATION
කොටු මාර්ග 07, කොළඹ-07 / මුද්‍රණය කළේය

Issued at: 03.45pm Thursday 12 December 2013

මේ මගින් මුද්‍රණය කළ අවදානම 2013.12.12 දින 03.00.0 විදහන් කරන ලද
අවදානම අවම කිරීමේ මධ්‍යස්ථානය විසින් 2013.12.12 දින 03.00.0 විදහන් කරන ලද
මේ අවදානම අවම කිරීමේ මධ්‍යස්ථානය විසින් 2013.12.12 දින 03.00.0 විදහන් කරන ලද
මේ අවදානම අවම කිරීමේ මධ්‍යස්ථානය විසින් 2013.12.12 දින 03.00.0 විදහන් කරන ලද

මුද්‍රණ 2013.12.12 ඔස්සේ 03.00 පමණ මුද්‍රණය කළ කොටු මාර්ග 07 කොටු මාර්ග 07
කොටු මාර්ග 07 / මුද්‍රණය කළේය. මුද්‍රණය කළ කොටු මාර්ග 07 කොටු මාර්ග 07
කොටු මාර්ග 07 / මුද්‍රණය කළේය. මුද්‍රණය කළ කොටු මාර්ග 07 කොටු මාර්ග 07
කොටු මාර්ග 07 / මුද්‍රණය කළේය. මුද්‍රණය කළ කොටු මාර්ග 07 කොටු මාර්ග 07

The tsunami warning issued at 03.00 pm on 12.12.2013 is cancelled. There is no tsunami threat to Sri Lanka at present. / The waves have now passed through island waters. The coastal areas of Sri Lanka are declared safe and those evacuated to safe areas may now return to their usual places of residence. Public is further informed that this withdrawal is announced in consultation with relevant national and international agencies.


Duty Meteorologist,
National Tsunami Early Warning Center,
Department of Meteorology,
Buddhaloka Mawatha,
Colombo-07.

National Tsunami Early Warning Centre
Department of Meteorology
363, Buddhaloka Mawatha,
Colombo 07.

RECEIVED
12/12/2013
15:46 PM
DISASTER MANAGEMENT



24 x 7 National Emergency Operations Centre





VHF base stations and radio at local level





Local dissemination happens through manual sirens, megaphones, cell phones etc.





2025 ന്റെ മലിനീകരണ പ്രശ്നത്തെ മൂലം - സമുദായ 205 C, അമ്പലമുക്ക്, (വേലായുധ)
 മണ്ണിലെ മലിനീകരണ സാധ്യതകളെക്കുറിച്ച് - അറിവുകൾ 205 C, അമ്പലമുക്ക് (അമ്പലമുക്ക്)
 EVACUATION MAP AND PLAN FOR NABHYANTHEEVU 205 C, KORALAPATTU, (VALACHIHERA)

EVACUATION ROUTE MAP

Legend

- 1. Evacuation Route
- 2. Evacuation Point
- 3. Evacuation Shelter
- 4. Evacuation Vehicle
- 5. Evacuation Point
- 6. Evacuation Shelter
- 7. Evacuation Vehicle

Sl. No.	Evacuation Point	Evacuation Shelter	Evacuation Vehicle
1			
2			
3			
4			

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1			
2			
3			
4			



De-briefing takes place to create awareness



Observer team takes not of the process





WSCAP
Kerala State Disaster Management Authority
National End-to-End Tsunami Simulation Exercise
03 December 2015, Kollam, Kerala, Sri Lanka

കേരള സംസ്ഥാന ദുരന്ത മാനേജ്മെന്റ് അതോറിറ്റി
Kerala State Disaster Management Authority
National End-to-End Tsunami Simulation Exercise
03 December 2015, Kollam, Kerala, Sri Lanka

3.

Key elements and lessons from
the of end-to-end simulation on the
ground

Some emerged procedures for conducting E2E simulations:

1. Preparatory meeting with the stakeholders (all parts in the end-to-end chain)
2. Create an outline for Simulation Plan
3. Develop the scenario (dummy messages, scripts for the simulation and drill) and time-wise sequences
4. Accomplish the background elements of End-to-End Early warning (e.g. PAS, evacuation map, signage, committees, equipments, S&R, Health)
5. Prepare the local DRM Committee (Table top practice)
6. Prepare the community
7. Form an observation team for evaluating and observing the process (including govt., NGOs, Media and others)
8. Conduct the simulation (with the committee) and drills (with community)
9. De-brief the community with the lessons and experiences (success and gaps) from the simulation and drills
10. Report the event with lessons learned and gaps identified

Planning and guidance on a hands-on manner is needed

မန်တိုင်း

Entities	Timeline	Entities	Roles	PLOT (Activities and mode)
DMH NPT	11:00	DMH NPT	<ul style="list-style-type: none"> • Observation: Meteorological division (<u>tracking+modeling</u>) • Issue warning and dissemination: <ul style="list-style-type: none"> ○ BULLETIN 1: NO COLOR (system developing in BOB) ○ WARNING 2: ORANGE (directed to Myanmar coast) ○ WARNING 3: RED (12 hrs before crossing & order evacuation) • Media briefing (interview director) 	<p>[PLOT 1] 10:30</p> <ul style="list-style-type: none"> • First forecaster discusses the BULLETIN 1 <p>[PLOT 2] 10:45</p> <ul style="list-style-type: none"> ○ Senior Forecaster (SECTION CHIEF) comes up with tracks and model run; ○ Issues the warning 2 and shares the color code information by FAX, Phone, SSB (WARNING 2) <p>[PLOT 3] 11:30</p> <ul style="list-style-type: none"> • Issues WARNING 3: RED (12 hrs before crossing & order evacuation) • Media Interview (WARNING 3)
Regional Level: DMH/RRD/GAD- (<u>Pathein</u>)		Regional Level: RRD (<u>Pathein</u>)	<p>Receives warnings</p> <ul style="list-style-type: none"> ○ WARNING 2: ORANGE (directed to Myanmar coast) 	<p>[PLOT 2] 11:00</p> <p>Receives the information and calls for a meeting at district level with all OFFICIAL DEPARTMENTS</p> <ul style="list-style-type: none"> ○ WARNING 2: ORANGE (directed to Myanmar coast) <p>By Phone and FAX</p>
Township Level:		Regional/District Level:	<p>Receives warnings</p> <ul style="list-style-type: none"> ○ WARNING 2: ORANGE 	<p>[PLOT 2] 11:15</p> <p>Receives the information and calls for a</p>

Ground work is essential....



End-to-end SIMULATION and DRILLS are useful ways to test and evaluate the existing Early Warning System procedures.

It's an opportunity to learn and strengthen it before the next disaster strikes

Thank You

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