

Last-Mile Hazard Warning System in Sri Lanka: *Community-based Alerting and Notification*

*Regional Joint Conference on Disaster Relief and Management,
Alexandria, Egypt
14th-17th Mar 2007*

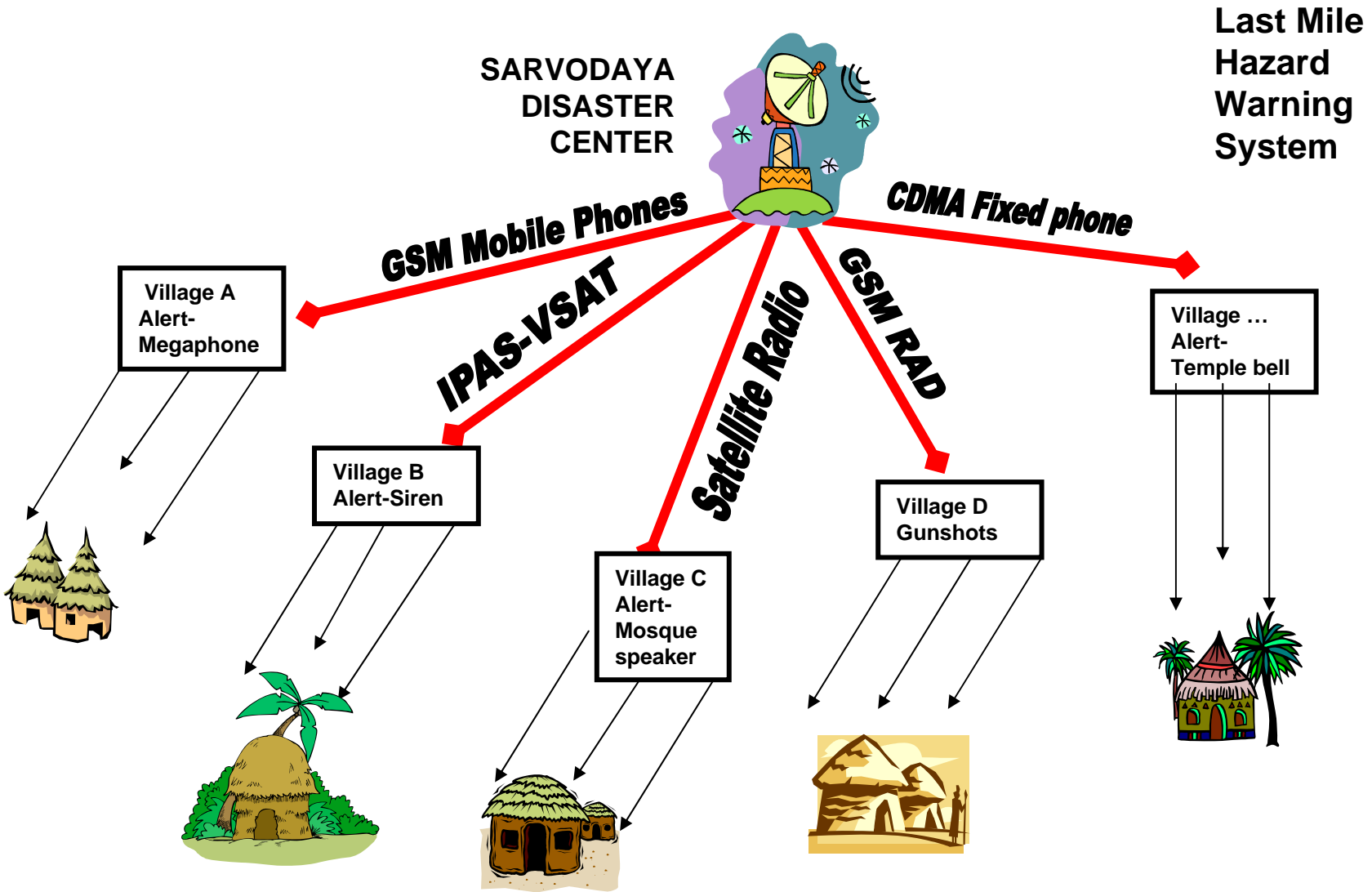


L I R N E *a s i a*

Learning Initiatives on Reforms for Network Economies

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Community-based Alert and Notification Concept



Hazard Info for last mile connectivity , A research Project

Research Hypothesis

- 1. Stage 4 & 5 Sarvodaya villages that are more organized, i.e., have a formal structure that enables coordination and direction of activities will respond more effectively to hazard warnings than less organized stage 1, 2 & 3 villages.*
- 2. Villages that are provided training in recognizing and responding to hazards along with deployment of ICTs will respond more effectively to hazard warnings than villages that received no training.*
- 3. Villages that have ICTs deployed for dissemination of hazard information will respond more effectively to hazard warnings than villages that have to rely on their existing channels of information for warnings.*
- 4. ICTs that in addition to their hazard function, can also be leveraged in other areas to enrich the lives of the villages will potentially have lower downtime than ICTs that are poorly integrated into the day to day life of the beneficiaries.*

5 ICTs Tested for Reliability and Effectiveness



CDMA



Mobile Phone



RAD











































AREA



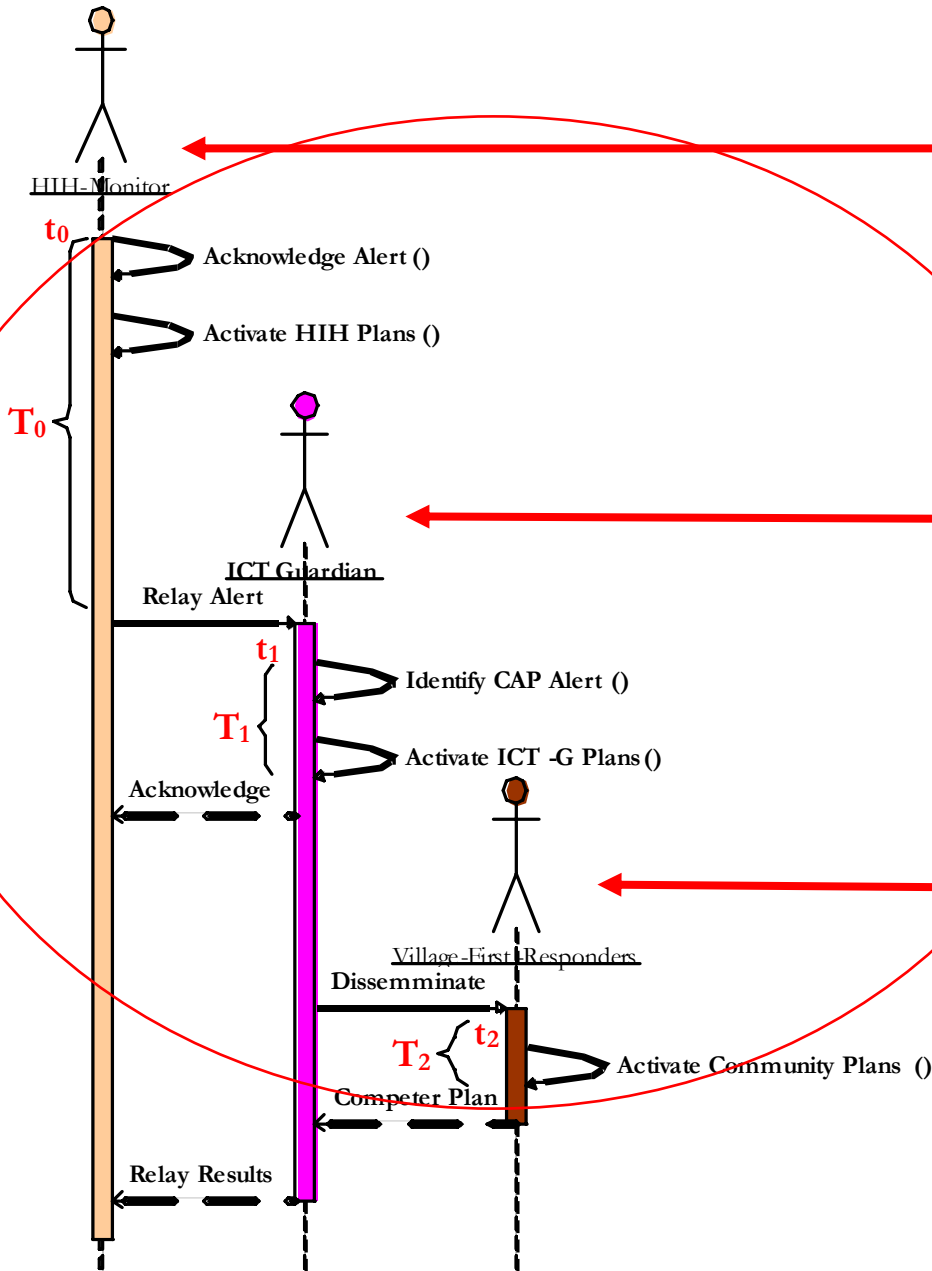
VSAT

Research Matrix

The general objective is to evaluate the suitability of five ICTs deployed in varied conditions for their suitability in the last mile of a national disaster warning system for Sri Lanka and possibly by extension to other developing countries.

	<i>Trained</i>				<i>Non - Trained</i>			
<i>Sarvodaya Villages Stages 1,2,3</i>	 Urawatta Galle	 Nirihavur Kalmunai	 Tirukkadalar Trincomalee	 Moratuwella Colombo	 Madiya East Matara	 Thambiliville Kalmunai	 Oluwill Kalmunai	 Maggona Kalutara
	 +  Kirinda/ Modarapelessa Hambantota	 +  Wattegama South Matara	 +  Palamunna Batticaloa	CONTROL VILLAGE Abeysinghe Pura Ampara	 +  Thondamanar Jaffna	 +  Shithakudi Puram Kalmunai	 +  Munrai Jaffna	CONTROL VILLAGE Modara Colombo
<i>Sarvodaya Villages Stages 4</i>	 Modaragama Hambantota	 Diyalagoda Kalutara	 Reriyakallar Batticaloa	 Parana North Ampara	 Maangadu Batticaloa	 Samdagama Hambantota	 Indivinna Hambantota	 Brahmarawatte Galle
	 +  Kalmunai ii Kalmunai	 +  Samudragama Trincomalee	 +  Velhengoda Galle	CONTROL VILLAGE Mirissa South Matara	 +  Venamulla Galle	 +  Kottegoda Matara	 +  Thalalla South Matara	CONTROL VILLAGE Thalpitiya Kalutara

Alert and Notification Stages



Stage 1: HIH Monitors

Stage 2: ICT Guardians

Stage 3: ERP Coordinators

Training-of-Training



“... in spite of mass media and ICT proliferation in Asia, reminding us that better management of information is critical. This project goes further, by building community capacity to respond to hazard information and warnings.”
(Gunawardene, N.)

From 3 to 9 April 2006, a residential training program was conducted for 24 youth leaders drawn from the Sarvodaya Shanti Sena (Peace Brigade) -- a countrywide youth force consisting over 100,000 persons dedicated to peace building and community development



Training of ICT Guardians



Training at Sarvodaya National Level



Training at District Level



Training at Community Level



Table Top Exercises at Community Level



Hazard Information Hub



Government Sources

Disaster Management Centre

(www.dmc.gov.lk)

Department of meteorology (www.meteo.slt.lk)

Epidemiology Unit (www.epid.gov.lk)

Ministry of Public Security Law and Order

(www.moi.gov.lk)

Global Feeds

Google Alerts (www.google.com/alerts)

World Meteorological Organization (www.wmo.int)

Pacific Tsunami Warning Center

(www.prh.noaa.gov/ptwc/)

Reuters (www.alertnet.org)

BBC World (www.bbcworld.com)

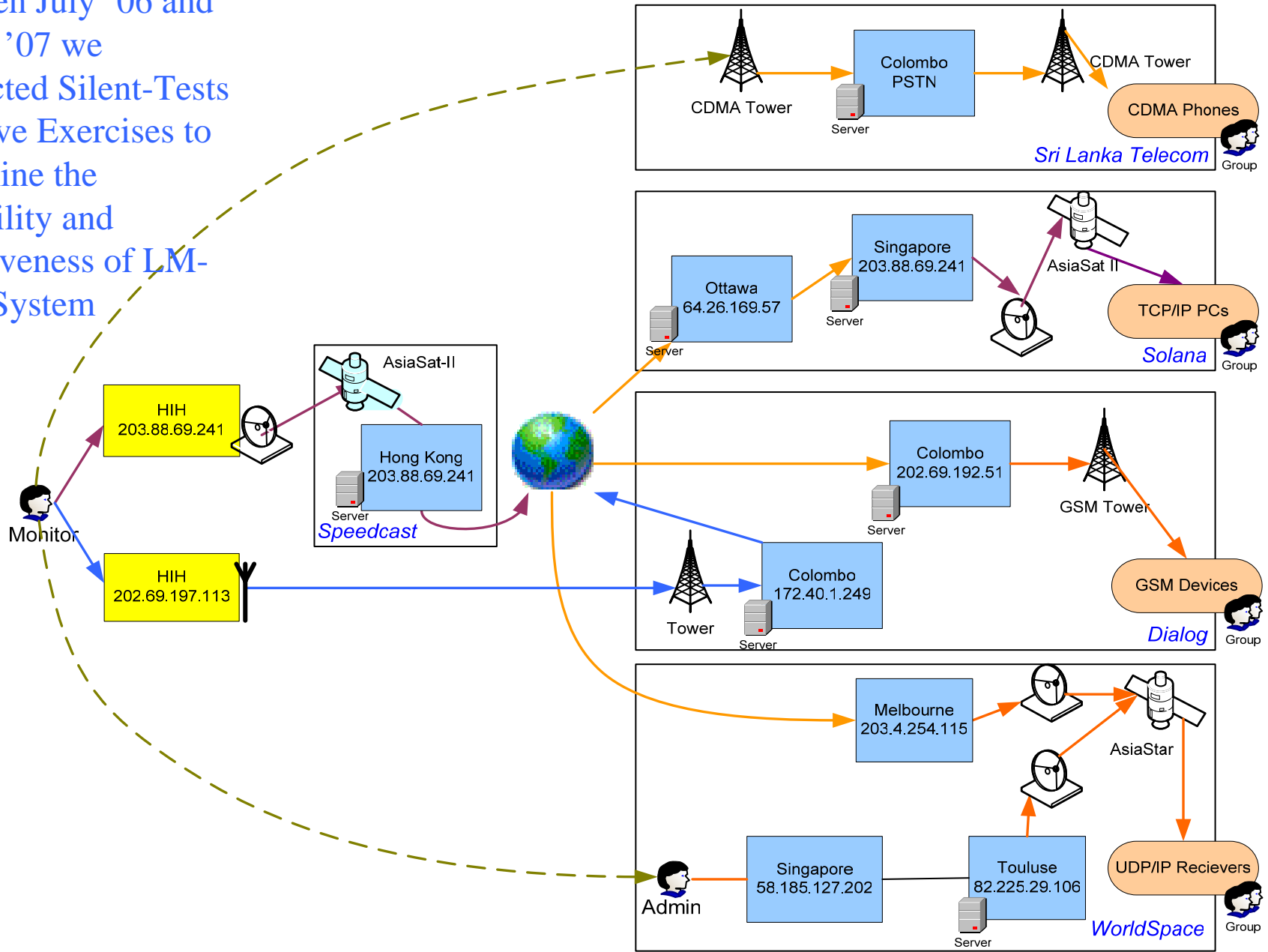
CNN World (www.cnn.com/WORLD/)

Monitoring Staff

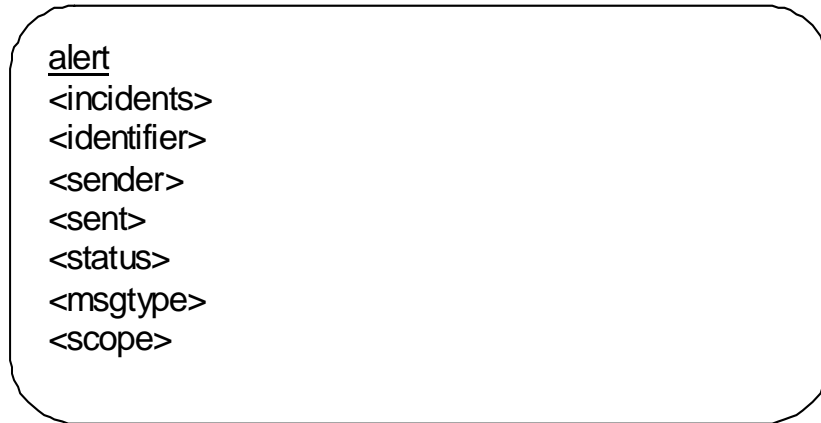


Multiple Paths, Multiple Technologies and Multiple Gateways

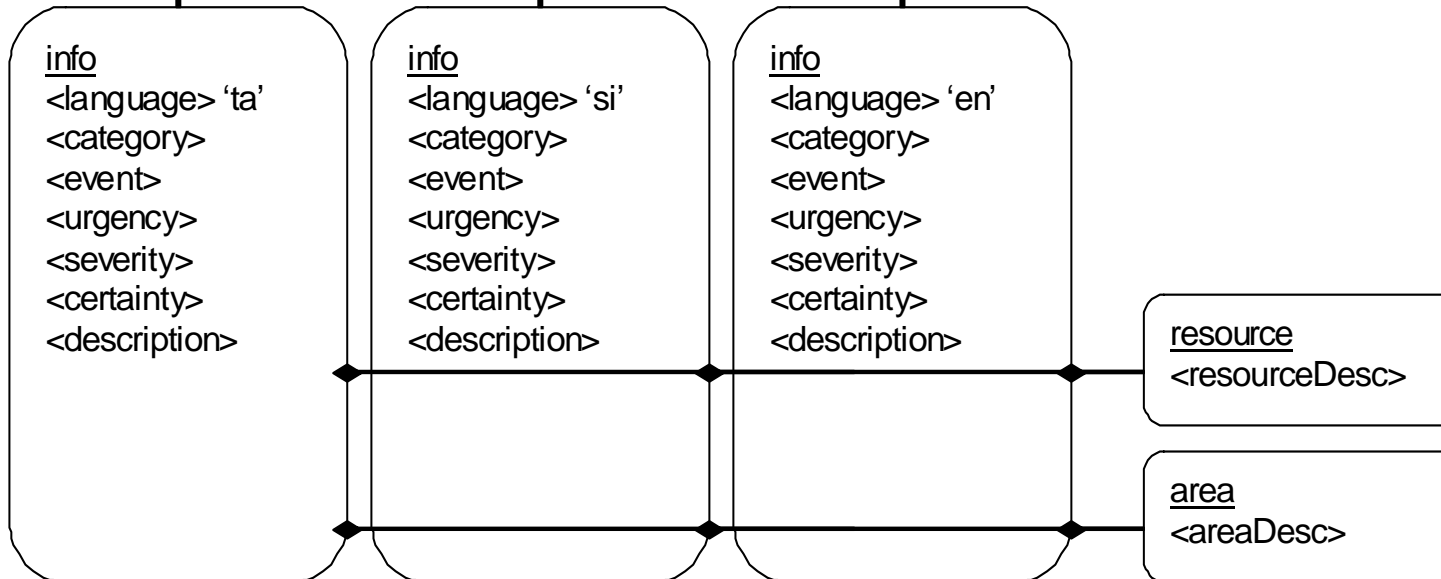
Between July '06 and March '07 we conducted Silent-Tests and Live Exercises to determine the Reliability and Effectiveness of LM-HWS System



Common Alerting Protocol Profile for Sri Lanka



Priority	<urgency>	<severity>	<certainty>
Urgent	Immediate	Extreme	Observed
High	Expected	Severe	Observed
Medium	Expected	Moderate	Observed
Low	Expected	Unknown	Likely



Example of Input Message to the last-Mile Hazard Warning System

TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST

Last-Mile HazInfo Simulation. No Repeat No Real Event is Effect

TROPICAL CYCLONE ADVICE NUMBER 001

Issued at 09:55 am on Monday, December 11, 2006

BY Anonymous

A **SEVERE CATEGORY 4 CYCLONE** is now current for AMPARA and MATARA District coastal areas. At **06:00 am** local time SEVERE TROPICAL CYCLONE MONTY was estimated to be **80 kilometres northeast of Ampara District** and moving southwest at 10 kilometres per hour. Severe Tropical Cyclone Monty is expected to cross the coast in the vicinity of Ampara and Matara Districts during Monday. Gales with gusts to 180 kilometres per hour are likely in coastal communities in Ampara and Matara District during the day.

This is to **alert** the residents of Ampara and Matara District about the potential of a very **dangerous storm** tide as the cyclone centre approaches the coast. **Tides are likely** to rise significantly above the normal high tide mark with very dangerous flooding, damaging waves and strong currents.

Widespread heavy rain and further flooding are likely in southern parts of the Ampara and Matara Districts over the next few days.

TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST TEST

Last-Mile HazInfo Simulation. No Repeat No Real Event is Effect.

Rating the 5 ICTs based on Live-Exercises

ICT / Measure	AREA	RAD	MP	FP	VSAT
Reliability (Mean Time To Failure)	0.95	0.95	0.95	0.95	0.95
Language ('si', 'tm', 'en')	0.20	0.20	1.00	1.00	0.20
CAP (xml)	0.85	0.70	0.70	0.80	0.20
Medium (Audio, text)	0.95	0.95	1.00	0.95	0.85
Direction (up, down)	0.85	0.95	1.00	1.00	1.00
Affordability (USD)	0.90	0.95	1.00	0.95	0.25
Power (Watts)	0.85	0.85	0.50	0.95	0.70
Utilization (Hours)	?	?	?	?	?
Acknowledgement (Minutes)	0.25	0.85	0.85	0.95	0.85
Wakeup (siren, light, vibrate)	0.85	0.95	0.85	0.85	0.50
Weight (grams)	0.85	0.85	0.95	0.95	0.25
Coverage (Signal Strength)	0.85	0.85	0.95	0.95	0.25
Rating	-	-	-	-	-