

Cell broadcasting



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Previous work

- IDRC funded USD 500k multi-year project on last-mile hazard information dissemination (HazInfo) completed in 2006-08
 - Multiple technologies tested for closed-user groups/first responder warning, including DEWN
 - Knowledge sharing in Bangladesh, India and Indonesia, 2007-08
 - DEWN implemented in 2009
 - World Disaster Review 2009 and other publications
- Almost-funded proposal for hotel training and certification, 2008
- Cell Broadcasting study for CAM, 2008-09
 - First on public warning

Importance of early warning

Cyclone Sidr



Why declining deaths?

Year	Cyclone	Strength	Deaths
1970	Bhola	Category 3	300-500,000
1970+21	Gorky	Category 4	~138,000
1970+37	Sidr	Category 4	~3,447

Completing the chain: Warning & training at the last mile

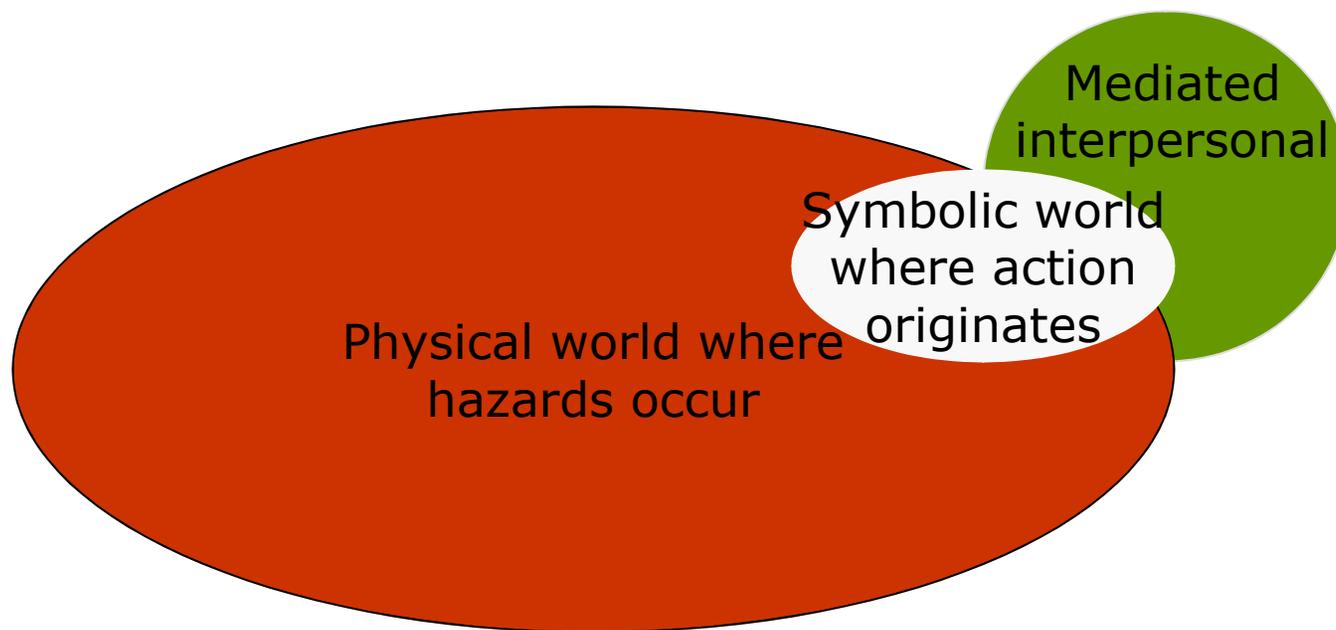
- Bangladesh reduced casualties (but not damage to property & livelihoods) through
 - Communicating cyclone warnings to villages through HF radios and trained volunteers
 - Easy-to-understand flag system at the last mile
 - Cyclone shelters
 - People who trust the warnings and evacuate

Deaths from Sidr would have been less, if not for false tsunami warning and evacuation one month earlier (September 12th, 2007)

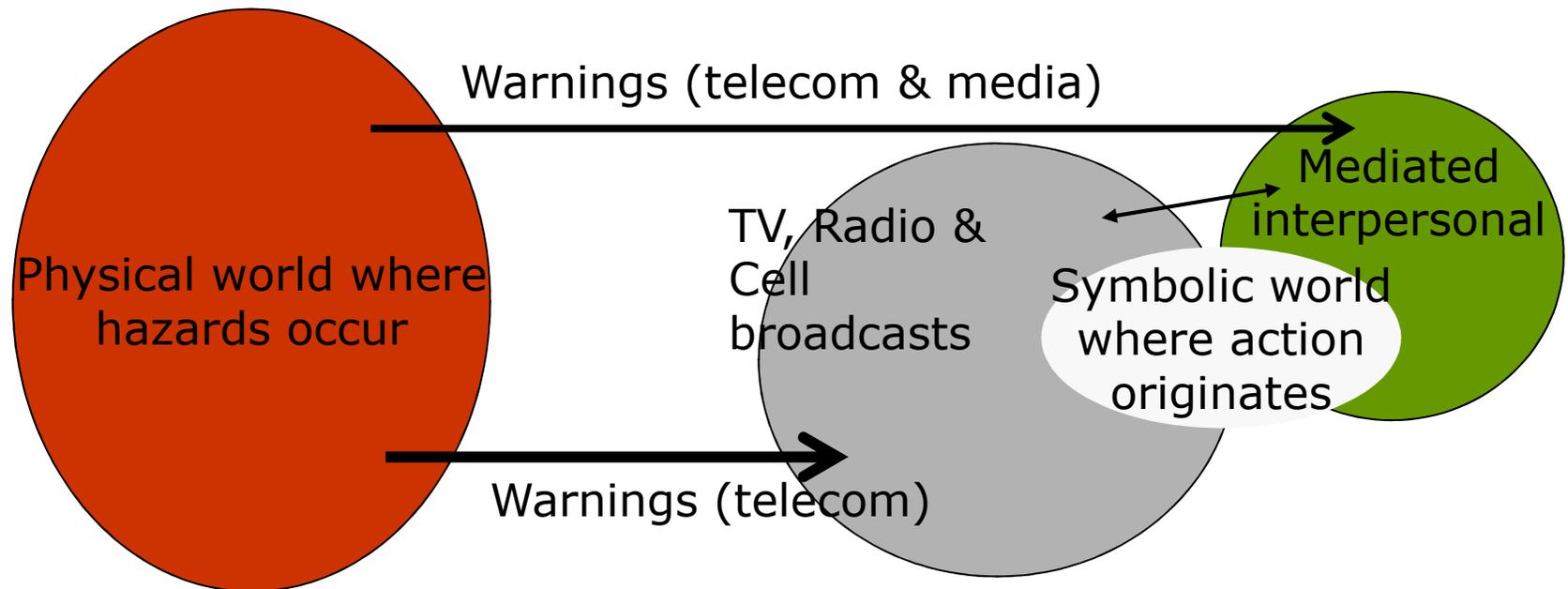
Cyclones & tsunamis

- Both affect the Bay of Bengal; tsunamis the Maldives
 - Tsunamigenic earthquakes in Sunda Trench every year since 2004 (except 2008)
- Difference is lead time
 - 2-3 days for cyclones
 - 90 mts to 6 hours for tsunamis for Bay of Bengal countries other than Indonesia
- Simply replicating Bangladesh is not enough
 - Bangladesh model used 1990s communication technology
 - Much has happened since (e.g. CB/SMS)

Physical and symbolic worlds, absent linking technologies



The physical, the symbolic & their linking through ICTs, simplified



More time to run; more lives saved

How mobile technologies may be used for risk reduction

- Using the illustration of Maldives, a island nation that had decided to implement a government network based on TETRA, but which asked LIRNEasia to assess how mobile networks could be used for public warning (and in a sustainable manner)

Public warning in the Maldives

- An island nation composed of groups of 26 atolls of about 1,192 islets of which 250 islands are inhabited
 - A public warning system must be able to reach a highly dispersed population in all of the inhabited islands
 - All inhabited islands covered by mobile; more than 100 active SIMs per 100 people
- At peak, tourists amount to 1/5th of the population

Public warning in the Maldives

- Radio/TV can be sent warning through TETRAnet or otherwise, but for warning to be received, sets have to be turned on and the link to transmitters not fail
- Satellite radio was an option (scored high in HazInfo field trials in Sri Lanka), but WorldSpace went bankrupt
- Tourists unlikely to be tuned to local TV/radio channels, or even have the sets turned on
 - All tourists resorts have mobile coverage and at least some tourists are likely to keep their handsets on

The answer is mobile

But what form? Cell broadcasting or SMS?

What about TETRAnet?

Cell broadcasting (CB) is . . .

- The technological ability to send a single text or binary message to multiple mobile phones within a cell
- Originally designed to let network operators offer location-based services
- It is a standard feature on GSM networks as well as on IS95 CDMA networks
- Essentially, it is a timely and efficient means of pushing out a message to an entire cell area without the lag times associated with SMS, which are queued
- It is a one-to-many mode of communication, unlike SMS, which is in essence a one-to-one mode

Short Message Service (SMS)	Cell Broadcast (CB)
Messages sent point-to-point (messages directed to handsets)	Messages sent point-to-area (messages directed to radio cells)
Requires input of recipient phone numbers	Does not require input or knowledge of numbers
Only pre-registered numbers notified	All numbers within a cell notified
Effective within normal mobile coverage area	Because the return signal from the handset is not required, effective over a much larger area especially over water.
Messages cannot be differentiated by location of recipients	Messages can be differentiated by cells or sets of cells
Subject to congestion and thereby, delay	Being broadcasts, not subject to congestion
140-160 characters in length. Can concatenate up to five messages	93 characters. Can concatenate up to 15 'pages' to produce a single message of up to 1200 bytes of data
No indication that message is generated by a legitimate authority	Not possible for outsider to generate a cell broadcast so greater authenticity

TETRAnet

- Is not a public warning system
 - It is a closed-user group solution for notifying first responders when they are in the vicinity of TETRA radios
 - There will be 500 handsets when the system is fully deployed
- TETRAnet is a first-responder system, not a public-warning system
- It is complementary to a good public-warning system

What if TETRAnet is combined with sirens?

- Will it directly connect the sirens or will first responders have to activate the sirens?
 - Questions of reliability in both scenarios
 - 12 September 2007 in Sri Lanka
- Sirens are warnings but they do not tell people what to do, CAP enabled CB can tell what precisely to do in multiple languages
- HazInfo showed that people like sirens
 - Best to have as supplement to CB

CB when there is no imminent disaster . . .

- Cell information
 - Switched on in many countries, but not in Maldives when study was conducted
- Advertising
 - Advertisers can have own channel (60,000+ logical channels available)
 - Subscription options must be available
- Mobile banking
- Event management
- Service and airport information

CB in other countries

- May 2005, South Korea became first country to use CB for public warning
- Mobile Democracy Platform in Turkey allows local governments to broadcast information on a variety of civic issues
 - Citizens must activate 888 channel
- October 2005, the Netherlands became first country in Europe to *require* all operators to transmit government text warnings via cell broadcasts
- Since November 2007, NTT Docomo in Japan offers Alert Mail, a CB service that provides warnings for earthquakes and tsunamis

CB elsewhere . . .

- USA is developing a Commercial Mobile Alert Service (CMAS) in ATIS (GSM and UMTS standardization) and TIA (CDMA standardization)
- January 30, 2009, Sri Lanka's Dialog Telekom together with the Disaster Management Centre (DMC) of Sri Lanka launched Sri Lanka's first ever mass alert warning system; the 'Disaster and Emergency Warning Network' (DEWN)
 - Emergency cell broadcasts will initially be done over the default Channel 50, but eventually dedicated emergency cell broadcast channels will be in place so that trilingual messages (Sinhala, Tamil and English) can be sent

Technology is only a part of the answer

- Need to work on protocols for communicating authoritative warnings and alerts from government authorities to telecom operators
 - Standard formats
 - Periodic drills
- Essential to get hotels and island communities to think through disaster response plans
 - Training and certification
 - Periodic refreshing of knowledge through drills or table-top exercises
 - Funding must be worked out