



Implementing Inclusive ICTs
Mobile Cell Broadcasting for Public
Warning and Commercial Use

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“Today even mobile telephones could be used as an effective medium to provide early warning and thus save lives and property”.

-- Nobel Laureate, R.K. Pachauri, while addressing the 5th convocation of the Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT) in January 2009, highlighted the need for ICTs in dealing with natural disasters and other weather-related events that pose a threat to human life and property.

Disasters are no comparison between India and Maldives!

| Overview | India (1980-2008) | Maldives (1987-2007) |
|---------------------------------------|-------------------|----------------------|
| No. of events | 395 | 4 |
| No. of people killed | 139,393 | 102 |
| Average killed per year | 4,807 | 5 |
| No. of people affected | 1,506,794,740 | 53,012 |
| Average affected per year | 51,958, 439 | 2,524 |
| Economic Damage (US x 1,000) | 45,184,830 | 506,100 |
| Economic Damage per year (US x 1,000) | 1,558,098 | 24,100 |

Adapted from: www.preventionweb.net.

The Problem

- Natural hazards are causing disasters in much of the world due to **poor knowledge access**. Knowledge before, during and after the event must transfer seamlessly between those *in the know* to those who *need to know*.

Why improve knowledge access?

- People need knowledge so that they can **prevent the negative impact of hazards** and **to make informed decisions** on daily activities.
- We now have the means of reaching a broad swathe of people through **mobile phones**.
- **Cell broadcast** is a built-in technology that can disseminate knowledge to large groups of people quickly and efficiently.

The study

- The Telecom Authority of the Maldives (TAM) requested this study in its quest for an effective public warning system that may be integrated into a comprehensive information system for commercial use.
- The LIRNEasia research on cell broadcast would allow TAM and other stakeholders to make an informed decision on whether to implement a CB system.

Objective of the study:

To investigate pre-conditions in the Maldives that would make it feasible to implement cell broadcasting within a national public warning system, and, concurrently, evaluate the use of cell broadcasting for commercial use.

What is Cell Broadcasting (CB)?

- The ability to send a single text/binary message to be distributed to multiple phones within a “cell”
- Originally designed as one mechanism for the offering of *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

SMS vs. Cell Broadcast

| SMS | Cell Broadcasting |
|--|---|
| Messages are sent point-to-point | Messages are sent point-to-area |
| SMS sender is a known entity | Unconfirmed push service |
| User-based. SMS provides no location-based information | Location-based push service |
| Store and forward service | Messages are not stored unless the user chooses |
| 140-160 characters in length | 93 characters |
| Poor Security. No indication that a message is generated by a legitimate authority | Good security. No way for an outsider to generate a CB message |
| Intense commercial use. SMS is traceable making billing simple | Little commercial interest. However, above Channel 100 the operator can bill for service. |
| No priority message feature | Messages are displayed in real time |

Findings from Maldivian Operators

- Only 2 operators – **Dhiraagu** and **Wataniya**
- Primarily interested in **marketing** and **advertising** uses of CB.
- Little in-depth investigation of cell broadcast = **poor grasp of its capabilities.**

Drawbacks from Maldivian Operators

- CB will have to be activated; **no commercial license** right now
- “Limited” CB message capacity
- GSM signals cannot go beyond the 25-35km distance from the tower

No regulatory approval to explore CB in depth to date

Why Cell Broadcast for Public Warning?

| Characteristic | SMS | CB |
|---------------------------------|--|--|
| Mobile Number Dependency | Dependent. Specific numbers must be input | Independent. |
| Location Dependency | Independent. Only registered numbers will be notified | Dependent. All numbers in a cell area will be notified. |
| Message Type | Static messages sent to pre-registered numbers. | Tailored messages can be sent based on alert levels. |
| Bi-directionality | Yes | Yes , through embedded numbers or URLs |
| Congestion and delay | Yes , because of queuing. | No , dedicated channels. |
| Message Length | 140-160 char.; up to 5X | 93 char.; up to 15X |
| Security | Poor authenticity | Good security |
| Service Barring | No barring | Limited, service must be on |
| Reception | Yes | Limited |
| Delivery Confirmation | Yes, sender can request | Only if number/URL within |
| Repetition Rate | None | 2 sec – 32 min intervals |

Other Recommended Uses for CB in Maldives

- Location-based information
- Events (i.e. sports, etc.)
- Service and airport information
- Advertising (advertisers can have their own channel; 60,000+ logical channels available)
 - Subscription options must be available
- Tourist information
- Islamic information (call for prayer, etc.)
- Mobile banking

Factors to consider for cell broadcast: Maldives vs. India

| Maldives | India |
|--|---|
| Telecom operators very small | Many and large telecom operators |
| No activated CBCs | CBCs activated (i.e. Celltick), CB companies active and available in-country (i.e. BSNL, Hutchison) |
| Little to no knowledge of CB | Extensive technological know-how on CB and complementary technologies |
| Limited number of applicable uses of CB | Numerous potentially applicable uses of CB |
| Few existing complementary warning systems (i.e. TETRAnet) | Plenty of complementary warning systems (i.e. INCOIS, etc.) |

Next steps: Make it a government priority!

- Operators are more concerned about **revenue.**
- Government needs to reach **everyone always. (citizens, tourists, etc.)**
- Government involvement will promote **homogeneity (i.e. handset standardization).**
- Government can provide **security (i.e. credible information source).**