Satellite Systems in Disaster Situations

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1. Transformed into a profitable and sustainable financial operation

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Nowadays, natural as well as climate-change catastrophes has represented an important decrease factor in the development programs for every society across the globe, causing structural damages and, in the worst cases, human losses.

A crucial aspect in such events is the attenuation of the destructive effects. As preventive culture growths in any civilization, it constitutes an essential element in the risk reduction strategy.

The earth itself is becoming instrumented to help predict disasters, communication systems are needed to convey the data to scientists, government agencies, emergency responders, and ultimately, the public.

ITU, United Nations organisms, Government entities, Public and Private Telecomm sectors must take the lead to promote pre and post disaster plans in each of our countries.

It is a matter of global priority to have early warning systems to prevent or minimize loss of life.
Weather-related phenomena, earthquakes, tsunamis, volcanic activity, etc. are examples of disasters
Brief Statistics – From 2000 to 2012

From the last twelve years, almost three thousand events caused practically one million casualties… bottom line is that several of theses disasters could have been reduced by using alerts or warnings...

Source: EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be, Universite Catholique de Louvain, Brussels (Belgium)
Most of the disasters previously mentioned, impact directly the Asian countries

Brief status in numbers

**Earthquakes**

Most of the people died in large earthquakes in Asia

**Floods**

38% of the casualties were in medium and minor floods in which lives could have been saved with timely information

Source: EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be, Universite Catholique de Louvain, Brussels (Belgium)
Nearly one million casualties in the past twelve years
Brief status in numbers

Storms

Current mechanisms works fine for
Storm prevention...

People losses caused by earthquake
2000–2011

> 50,000
> 10,000
> 1,000
< 499

However, with better technologies, numbers could be dropped down

Source: EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be, Universite Catholique de Louvain, Brussels (Belgium)
Society must be familiarized in the reduction risk practices, mainly based in the technological advanced applications properly integrated in a cultural context.

The “Millennium Declaration” in year 2000 recognizes the importance of creating all kind of procedures and politics for the prevention and attention of disasters.

The access to Information Technologies and Communications (TIC’s) is fundamental in order to broadcast the relevant data that allows to create preventive actions.

Intensify the cooperation across the globe in order to diminish the number of effects in natural disasters as well as the ones caused by us such as climate change.
Prevention as well as Re-action are essential in a disaster situation
Two time regime for disasters

- Warning preparations
  - Prevention
  - Mitigation
  - Preparation
  - Alert

- During Disaster
  - Evacuation – Assistance – Search - Rescue

- Damage assessment and Emergency response
  - Recovery
  - Service reestablishment
  - Reconstruction and rehabilitation

Saving lives as our top objective

Pre - Disaster

Post - Disaster
While a disaster occurs, tactical communication, health, formal messaging and inter institutional traffic must be assured.

Ideally, if any additional communication channel exists, the population could:

• Support in the evacuation
• Operate in hostels
• Assist government entities
• Ask for medical assistance

One of the most reliable communications systems up to this moments, has been the satellite systems.
It is our responsibility to take the lead to promote pre and post disaster plans
Emergency Communications and Monitoring Systems

Ground and Space-based science data must be delivered from remote locations inexpensively and reliably to distributed analysis centers

Monitoring systems are / will be developed to detect all types of natural disasters

Terrestrial Infrastructure + Space Infrastructure + Social Networks

Government, Public and Private entities
Technology can be applied to safe lives
Emergency Communications and Monitoring Systems

Electromagnetic Monitoring
• Magnetic disturbances
• Air conductivity changes
• Infrared signals
• Ionospheres' disturbances
• Radio propagation changes

Seismic Monitoring
• Quake patterns (over the years)
• Seismic events (in months)

Data Fusion
• Multiple / simultaneous signals
• Pattern Recognition
• Data analysis

• Emergency broadcast

Source: QuakeFinder.com
Satellite systems exceed natural and physical barriers reaching wider geographic distances
Emergency Communications and Monitoring Systems

Satellites as an ideal solution when:

- Terrestrial infrastructure is insufficient
- Large geographic distances
- Continuous climate affectations
- Spot / multi spot communications
- Implementation velocity / flexibility
- Last mile connectivity
- Occasional / permanent service
- Redundancy

Current / Future Supply:

- Global coverage, immediate access to large distances
- Independent to terrestrial technologies
- Large bandwidth available
- Faster data rates
- Larger variety of data, voice and video applications
- Mobil equipment utilization

Satellite technology is fundamental in the reestablishment of communications post-disaster
Conclusions

- Natural disasters do occur, without a timely warning
- Climate change, as a product of our own excessive industrial activity have created un-balances in the global ecosystems
- As long as we do not revert the effects of the climate change, we must be prepare to engage the inevitable throughout conjunct actions and a proper prevention culture
- The size of the challenges and the reaction speed will push us to unite efforts throughout the entire world in order to establish action plans that could attend, in a formal / integral way, the emergency situation in any country
- Plans must consider prevention stages, intervention and reestablishment by using the most state-of-the-art technologies both terrestrial and in space, without leaving aside the financing required
- Without a doubt this forum with the ITU, through the BDT Office as well as the “Superintendencia de Telecomunicaciones de Guatemala” represents one of the best places to elaborate an integral Action Plan that could allow us to unite efforts to be better prepared in any disaster

Thank you
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