Commonwealth Telecommunications Organisation

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Using ICT for Effective DISASTER MANAGEMENT Caribbean Forum 2006

ITU International Telecommunication Union

OFFICE OF DISASTER PREPAREDNESS AND EMERGENCY MANAGEMENT

ODPEM

Coordinating the disaster response:

THE BENEFITS THAT SENSORS CAN BRING TO DISASTER MITIGATION

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Director General (Actg.)
Office of Disaster Preparedness and Emergency Management

Outline

- Introduction to Sensors;
- Current example in Jamaica
  - (ODPEM-WRA; Earthquake Unit, Met Services
- Sensors: challenges in Information gathering and management;
- The importance of situational awareness to enhance disaster management
- Ongoing Development at ODPEM

Introduction

- Unplanned Settlements
- The global experience Increased occurrences in natural disasters
- Significant Damage in billions of dollars
- The Challenge is therefore to predict, forecast and manage hazards to reduce threat to life and property
- Advance sensing systems are therefore an important tool in this regard

What are sensors?

- Physical device (most are electrical) that detects a signal suggesting a change in the normal state

- Links directly/indirectly through a computer, so that the value sensed becomes human readable;

Why Sensor Use In Disaster Management?

- To take preventive measures to avert disasters
- It allows integration and analysis of spatial and temporal disaster data
- Aids the modeling and simulation disasters more precisely.
- Allows for real-time decision making and enhance emergency response capabilities.

Examples in Jamaica

- Met Services
  - Weather stations
  - Radar
  - Rainfall Gauges
- ODPEM/WRA
  - Telemetric Early Warning Systems and Community Flood Warning systems
  - Stream Flow Gauges
- Seismic Unit
  - Ground Acceleration Stations
  - Seismic subsystem
  - Sea-level subsystem

Challenges of the use of Sensors

- Reliability (e.g. incomplete information needs to be detected);
- Performance: guarantees efficiency;
- Maintenance and training: in-house capability;
- Cost: benefit/profitable;
- Security (e.g. hostile environment);
- Technological upgrade;
- Supporting infrastructure to maximize use of technology

Information Challenges

- Credibility of Data
- Availability (data exists but are not easy to locate or difficult and costly to acquire)
- Standardization
- Maximizing the utility of available information
- Interoperability

Situational Awareness to support Mitigation

A process of monitoring vulnerabilities and comparing them with possible threats thereby allowing for critical decisions to be taken at all stages of the disaster cycle

Situational Awareness

WHAT IS AT RISK?

- Infrastructure
- Critical Facilities
- Human Settlements

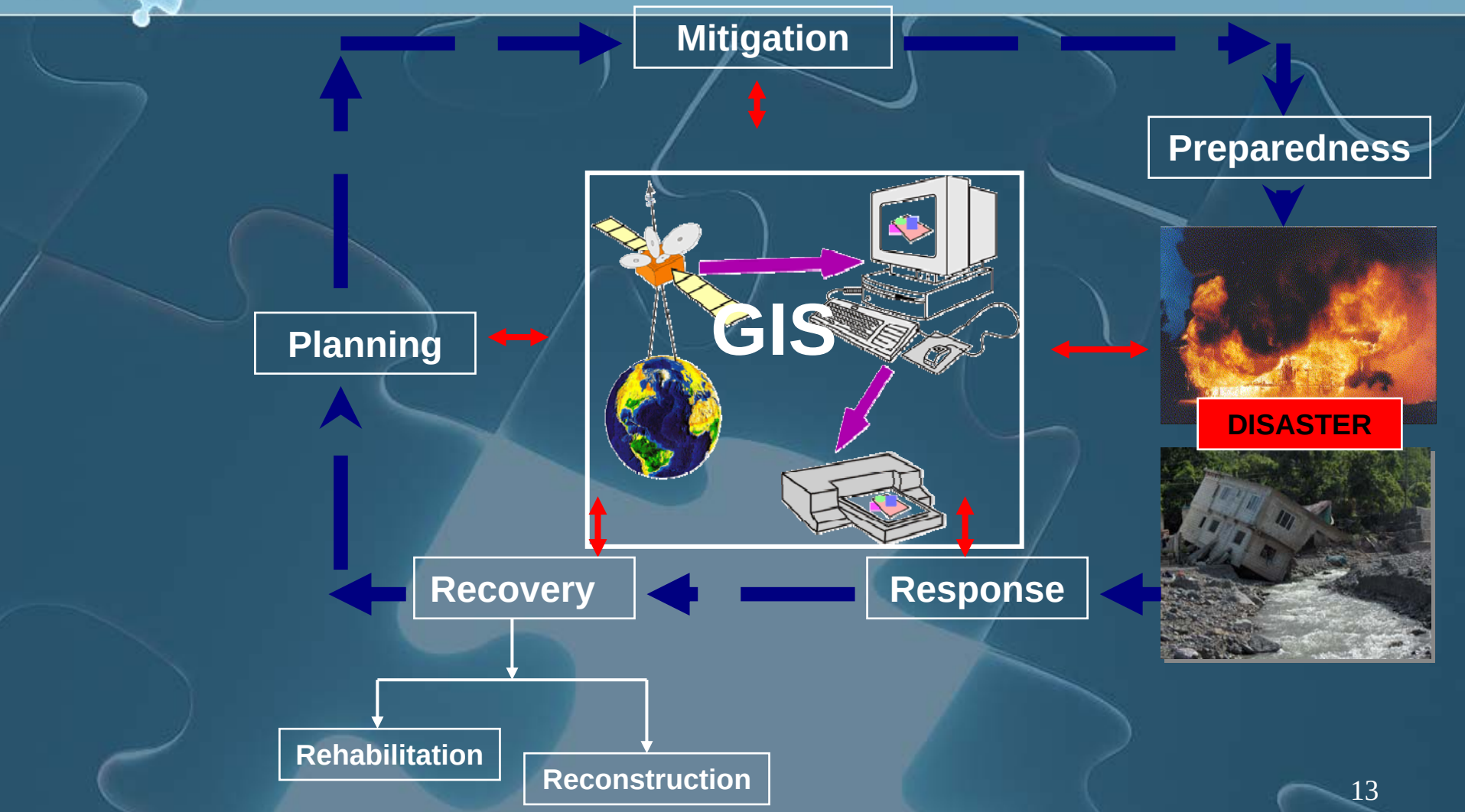
Situational Awareness to support Mitigation

- Allows for vulnerable population and disaster management persons to be aware of the details of their vulnerability
- Allows for mitigation decisions to be made
- Builds support for programmes and activities which support mitigation

Situational Awareness to support Mitigation

- Allows for planners to have an in depth understanding of vulnerable population, vulnerable areas, hazards and sectors at risk
- Allows for appropriate planning measures to be put in place

Situational awareness provided at all stages of the Disaster Cycle

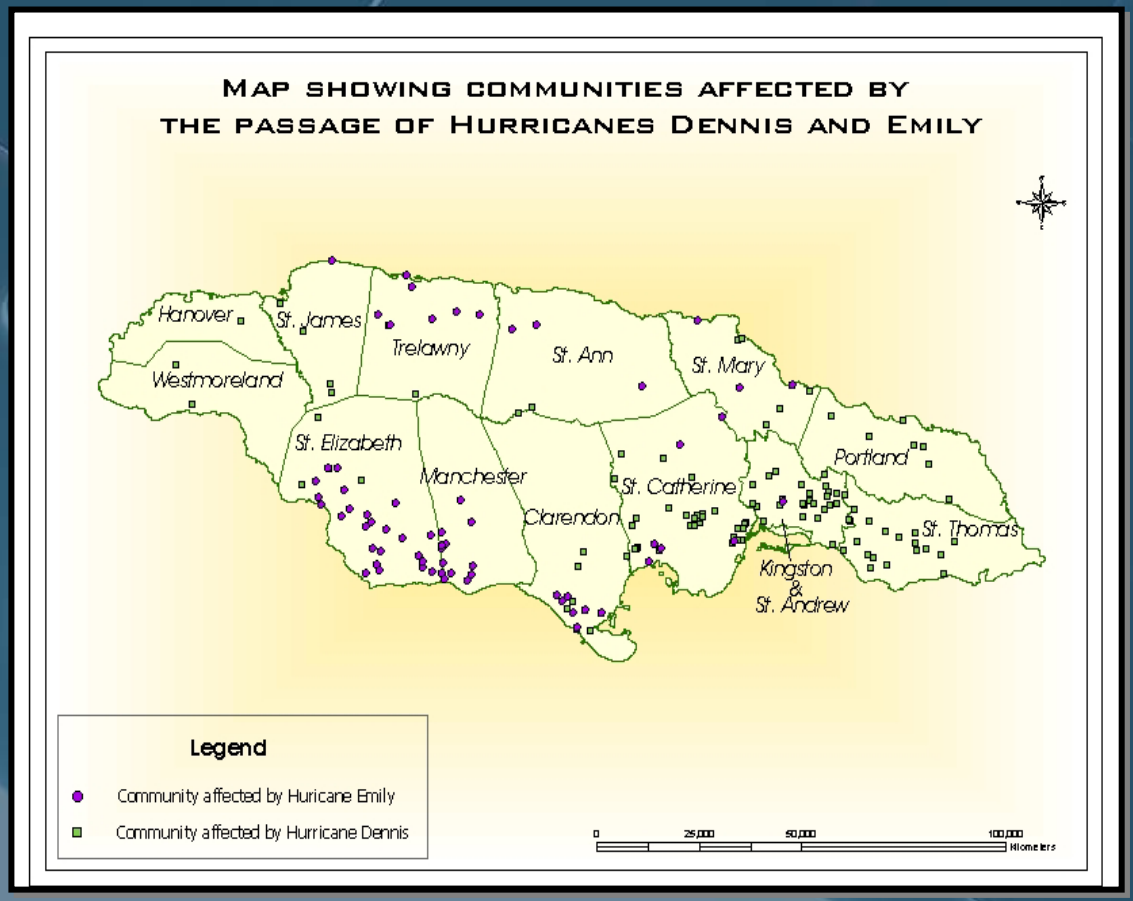


Situational Awareness to support Mitigation

- Short Term
  - Early Warning
  - Pre-impact activities
  - Evacuation
- Long Term
  - Land use Planning
  - Building Community Resilience
  - Relocation
- Medium
  - Training
  - Public Awareness
  - Shelter Program
  - Contingency Planning
  - Structural Mitigation
  - Reconstruction

Situational Awareness

WHERE IS THE INCIDENT?



MITIGATION

HOW CAN THAT RISK BE REDUCED?

- Structural Mitigation
- Non Structural Mitigation

- GIS allows you to spatially represent areas at risk and the level of Risk associated with a particular Hazard.

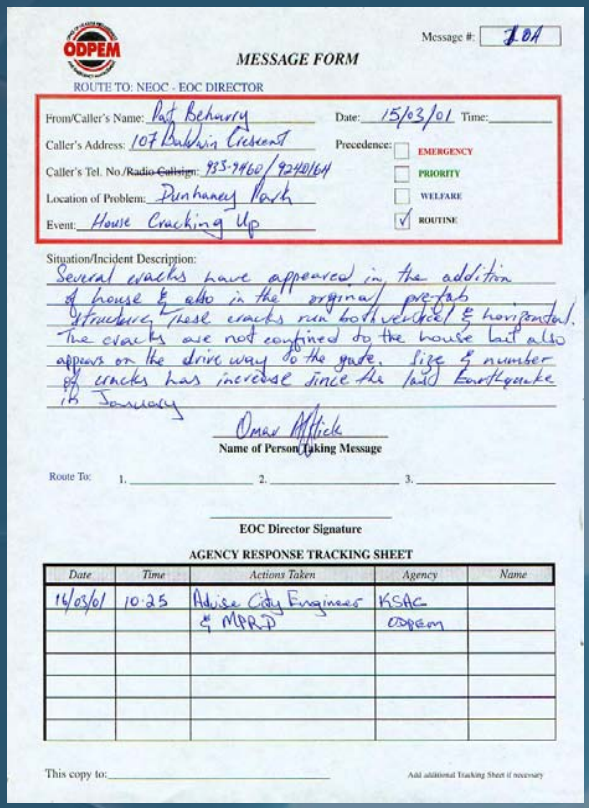
- This in turn guides decision making as to possible Mitigation measures.

Tools towards establishing situational awareness

- Telecommunications equipment
- Situation Reports
- GIS Mapping
- Remotely Sensed Data (Satellite)
- Weather Radar
- Gauges
  - Stream flow
  - Rain Gauges

Tools towards establishing situational awareness

- Electronic Message Handling System (EMHS)



ODPEM

Message #: 10A

MESSAGE FORM

ROUTE TO: NEOC - EOC DIRECTOR

From/Caller's Name: Pat Beharry Date: 15/03/01 Time:

Caller's Address: 107 Baldwin Crescent Precedence: EMERGENCY / PRIORITY / WELFARE / ROUTINE

Caller's Tel. No./~~Radio Callsign~~: 933-9460/9240164

Location of Problem: Dunhaney Park

Event: House Cracking Up

Situation/Incident Description:
Several cracks have appeared in the addition of house & also in the original pre-fab structure. These cracks run both vertical & horizontal. The cracks are not confined to the house but also appears on the drive way to the gate. Size & number of cracks has increase since the last Earthquake in January

Omar Affick
Name of Person Taking Message

Route To: 1. 2. 3.

EOC Director Signature

AGENCY RESPONSE TRACKING SHEET

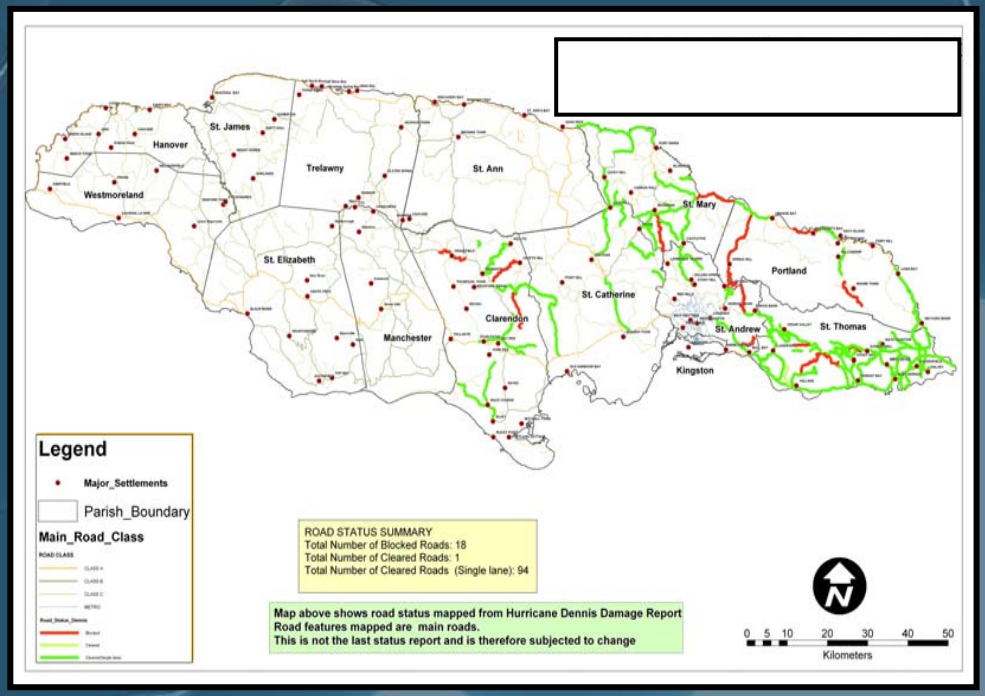
Date	Time	Actions Taken	Agency	Name
16/03/01	10:25	Advise City Engineer & MPRD	KSAC ODPEM	

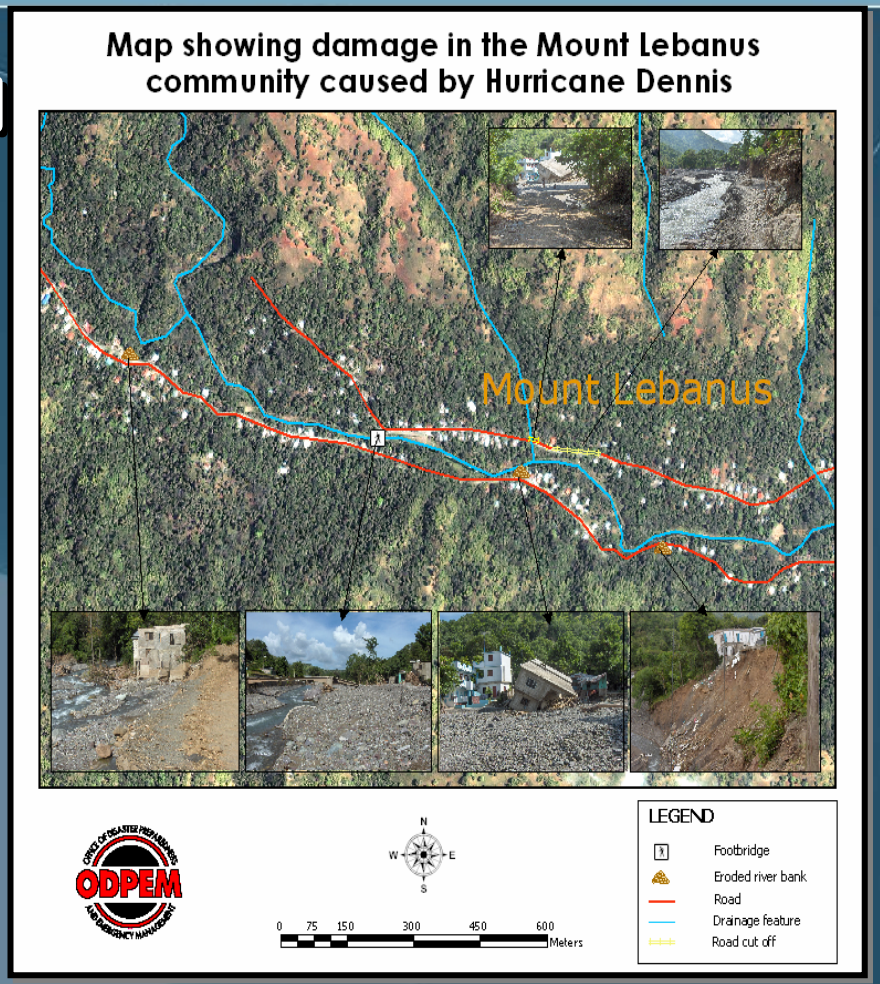
This copy to:

Add additional Tracking Sheet if necessary

Damage Assessment

WHAT HAS BEEN DAMAGED?





3D MODEL OF PORT MARIA SHOWING THE HURRICANE ALLEN STORM SURGE BOUNDARY

Ongoing Development

- **Real Time Information Exchange among partners before, during and after a disasters**
- **Develop Community Vulnerability Ranking System (e.g. community boundaries, population density, hazard history);**
- **Network Analysis and modeling: shortest path, nearest facilities, evacuation planning, simulation;**

Ongoing Development

- **Web-mapping (report information, 4 ODPEM applications);**
- **Re-establish telecommunications facilities**
- **Link GIS with Electronic Message Handling System**
- **Use of GIS to conduct Modelling**

Thank You

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