COUNTRY PRESENTATION - SRI LANKA

DISASTER MANAGEMENT IN SRI LANKA

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Ministry of Disaster Management
Sri Lanka

1st March, 2011 in Kobe, Japan
SRI LANKA

- Sri Lanka is an Island

- Location
  - Indian ocean
  - Indian sub continent
  - Latitudes 5°55’-9°55 N
  - Longitudes 79°42’-81°52’ E

- Land area : 65,610 sq km

- Maximum Length : 445 km

- Maximum Breadth : 225 km
SEEGIRIYA- An ancient Palace on the Top of a ROCK
Now, let’s talk about natural disasters in Sri Lanka
Natural Disaster Profile of Sri Lanka

Sri Lanka can be affected by different types of natural disasters every year:

- An outline of natural events of varying national concern
- Floods
- Landslides
- Cyclones
- Drought
- Lightning
- Coastal erosion
- Ground settlements
- Earthquake
- Tsunami

The Hazard Profile

Number of people affected by different disasters in Sri Lanka (1974 – 2008)

- Flood: 2,964,655
- Tsunami: 1,009,474
- Landslide: 46,719
- Drought: 2,072,512
- Storm: 303,001
## Natural Disasters in Sri Lanka - 1993 to 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Deaths</th>
<th>Damaged Houses</th>
<th>No. of Affected Families</th>
<th>Expenditure for Disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>36</td>
<td>42,468</td>
<td>237,737</td>
<td>43,726,604</td>
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<tr>
<td>1994</td>
<td>18</td>
<td>52,927</td>
<td>357,333</td>
<td>40,156,807</td>
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<td>1995</td>
<td>1</td>
<td>11,707</td>
<td>91,921</td>
<td>55,288,253</td>
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<td>1996</td>
<td>13</td>
<td>9,343</td>
<td>216,208</td>
<td>452,002,869</td>
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<td>1997</td>
<td>19</td>
<td>3,608</td>
<td>466,153</td>
<td>318,089,287</td>
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<td>1998</td>
<td>5</td>
<td>7,937</td>
<td>38,002</td>
<td>106,665,779</td>
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<td>1999</td>
<td>9</td>
<td>3,803</td>
<td>167,416</td>
<td>145,994,839</td>
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<td>2000</td>
<td>15</td>
<td>86,845</td>
<td>257,682</td>
<td>65,398,998</td>
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<tr>
<td>2001</td>
<td>6</td>
<td>11,445</td>
<td>458,008</td>
<td>506,214,166</td>
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<td>2002</td>
<td>02</td>
<td>5,112</td>
<td>20,201</td>
<td>28,389,474</td>
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<td>2003</td>
<td>254</td>
<td>37,227</td>
<td>140,310</td>
<td>1,740,153,392</td>
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<td>2004</td>
<td>31,723</td>
<td>62400</td>
<td>257625</td>
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</tr>
</tbody>
</table>

Source: Dept. of Social Services

### Man-Made Disasters

Man-made disasters have claimed more than 64,000 lives and affected the economy, society, and environment.

During last 10 year period, it was reported, 35 major disaster events

Total economic loss was US$ 6.16 Billion
LEGISLATIVE BACKGROUND

- Floods and landslides (2003) and various medium to small scale disasters over the past few years have brought back into focus the fact that Sri Lanka is a disaster prone country.

- Need to strengthen all aspects of Disaster Risk Management (DRM) – both pre-disaster risk reduction as well as post-disaster response mechanisms.

- Tsunami (2004) has reactivated the urgent need for a DRM legislation in Sri Lanka.

In May 2005, the Government of Sri Lanka passed the Sri Lanka Disaster Management Act No 13 of 2005 in the Parliament. DMC was established according to the above ACT.
• The National Council for Disaster Management (NCDM) was established, as per the act.

• The Disaster Management Centre (DMC) was established under the National Council for Disaster Management (NCDM) as the lead agency on disaster risk management in the country in implementing the directives of NCDM.

• In December 2005, the Ministry of Disaster Management was established.
**ORGANIZATIONAL STRUCTURE OF DISASTER MANAGEMENT CENTRE**

**National Level**
- **DISASTER MANAGEMENT CENTRE** (Director General)
  - Disaster Management Technology, Mitigation Unit (Director)
  - Forecasting, Early warning & Dissemination Unit (Director)
  - Preparedness Planning Unit (Director)
  - Training, Education & Public Awareness Unit (Director)
  - Personnel & Administration Branch (Deputy Director)
  - Media Unit (Deputy Director)

**Intermediate & Local Levels**
- District Emergency Operation Centre (DM COORDINATOR)
- **Disaster Management Assistants**

**Functions of the DMC as per the DM Act**
- Preparation & implementation of National Disaster Management Plan for the country
- Preparation & implementation of National Emergency Operation Plan for the country
- Assisting various Ministries, Government Departments and Public Corporations in preparing their disaster management plans
- Implementing programs and plans for disaster preparedness, mitigation, prevention, relief, rehabilitation, and reconstruction activities and coordinating of such organizations
- Issuing instructions and guidelines to appropriate organizations, non-governmental organizations, district secretaries and divisional secretaries on activities related to disaster management
- Promote research & development programs
DISASTER MANAGEMENT CENTRE (DMC)

Vision:
Disaster Risk Management for safer communities and sustainable development in Sri Lanka

The Broad Mission:
To create a culture of safety among communities and the nation at large through systematic management of natural, technological and man-made disaster risks

• EXCEPT TSUNAMI AND EARTHQUAKES, ALL THE OTHER NATURAL DISASTERS THAT AFFECT TO SRI LANKA ARE HYDRO METEOROLOGICAL DISASTERS

Concentration on major Weather Pattern is important
FLOODING IN SRI LANKA

Rivers of Sri Lanka
Floods during the North-East Monsoon

Floods during the South-West Monsoon
Main Causes of Flood

(1) High Rainfall Intensity in Short Duration
(3) Inadequate River Capacity
(4) Encroachments and unauthorized settlers in flood prone areas
(5) High density of population in marginal areas, Deforestation and improper land use
(6) Absence of scientific soil conservation practices
(2) Geo-morphological existence of Sri Lanka—Three penne plains along with steep intermediate slopes.
DEFORESTATION FOR CULTIVATION IN UPPER CATCHMENTS

UNPLANNED CULTIVATION IN HILLY AREAS
(Causes intensive soil erosion leading for lowering of stream capacity through siltation)
SEVERE SILTATION DUE TO SOIL EROSION

BLOCKING OF WATER WAYS THROUGH INAPPROPRIATE CONSTRUCTION
Unauthorized Construction along the river

Illegal Construction in Buffer Zones
CONSTRUCTION IN BUFFER ZONES

Flooding in Rathnapura

ILLEGAL LAND FILLING

LOW LAND RECLAMATION
INAPPROPRIATE WASTE DUMPING TO THE RIVER BANKS

BLOCKING WATER WAYS BY WASTE
POOR MAINTANANCE OF CANALS

COUNTERMEASURES

DESLTATION OF LAKES, RESERVOIRS, PONDS TO MINIMISE FLOOD DAMAGE
IMPACTS OF LANDSLIDES ON THE HILLY TERRAINS IN SRI LANKA

Landslides are one among the natural hazards that had impacted most our economy and human habitat over the past.

LANDSLIDE PRONE DISTRICTS
Kandy
Matale
Nuwaraeliya
Badulla
Rathnapura
Kegalle
Kalutara
Galle
Matara
Hambantota
frequency of landslides occurrences are increasing.

Major landslides occurred during the past two decades have taken the lives of hundreds of people and about 175,000 people became homeless.

Major causes of increase the frequency of landslides are unplanned land use practices:

- unplanned cultivation
- non-engineering constructions (Cutting and filling unsupported slopes)
- Construction by blocking the waterways
- Construction in the reservation area of water bodies
- deforestation
- negligence of land
Impacts Associated with Landslides

• Danger to life, property and infrastructure
• Soil erosion
• Increase of Sedimentation
• Flooding
• Impacts on agriculture
• Damage to forest cover and wildlife
• Social impacts (eg. Livelihood)

Action Taken to Manage Landslide Impacts

• Landslide Hazard Mapping
• Environmental Impact Assessment
• Stabilization of Landslides
• Awareness creation
• National Level co-ordination
DROUGHTS

DEFORESTATION FOR CULTIVATION IN UPPER CATCHMENTS

CAUSE REDUCTION OF MOISTURE CONTENT IN SOIL LAYERS AND LOWERING OF GROUND WATER LEVEL
(2) INTENSIVE RIVER SAND MINING

River Sand

Lowering of GWL

Bank failure
(3) INTENSIVE GROUND WATER PUMPING FROM TUBE WELLS AND AGRO WELLS

ZONE OF INFLUENCE

GW FLOW

FRACTURES

BED ROCK

CONSTRUCTION OF TUBE WELLS
MITIGATION OF DROUGHTS

(1) REFORESTATION PROGRAMMES
(2) APPLYING SOIL EROSION TECHNIQUES

(3) INTRODUCING RAIN WATER HARVESTING METHODS
Effects of 2004.12.26 Tsunami
Earthquakes

- Reported earthquakes:
  14\textsuperscript{th} April, 1615 – no. of deaths  2000

Minor earthquakes in

Source: Earth and Environment
by Prof. Rohana Chandrajith and
Prof. C.B.Disanayake
(publication of Geological Society of Sri Lanka)
According to the USGS, a new plate boundary has been formed near by Sri Lanka after 2004 earthquake occurred at Sumatra, Indonesia. It is situated almost 480 km South-East of Sri Lanka.
If so, Sri Lanka may be more vulnerable to Earthquakes and Tsunami

Minimize the Effects of Tsunami
1. Monitoring and Early Warning

- Monitoring System through Instruments and Equipments
  - E.g. Buoy, Seismographs
- Data from Satellite Network and transmission stations
- Standby Monitoring staff
- Early Warning Systems
- Communication network
- Monitoring of behavior of sea currents

Establishment of Early Warning Towers started on December 26, 2006
2. Preparedness for Evacuation

- Evacuation plans and procedures
- Previously identified places for evacuation
- Evacuation structures with suitable structural designs
- Signboards
- Conducting mock-drills for Tsunami evacuation
Tsunami-Prepared Model Village, April 2005
Balapitiya, Sri Lanka
Pop 450, Casualties 12

Helicopter Landing Area
Pop 450, Casualties 12
Alarm
Disabled persons
Evacuation routes
Disabled persons
Rescue shelters
3. Mitigation

- Constructing Wave breakers and barriers

4. Public awareness programs

- Occurrence of Earthquakes
- To identify the pre-signs of the Tsunami generation.
- Abnormal behavior of animals in case of Tsunami
My Responsibilities on DRR in District

- Coordination and Implementation of DRR projects to reduce risks that can cause future disasters.
- Dissemination of disasters forecasted by DMC to vulnerable community through District, Divisional and village level DM committees.
- Carrying out Emergency Operations, coordinating with armed forces, police, other related agencies and community in case of emergency.
- Preparation of District, Divisional and Village level Disaster Preparedness plans and conducting mock-drills by coordinating with relevant organizations.
- Conducting Public Awareness Programs for officials, school children and community level by coordinating with relevant organizations.

Why I am here?

Considering the above disasters in Sri Lanka, the visiting researcher program of ADRC has been a great opportunity to me to achieve my proposed target as Establishment of Sustainable Flood Early Warning System for selected stream in Kegalle District, Sri Lanka. This will be benefited to my mother land to achieve my ultimate responsibility which is “SAVE THE LIVES”
COMPREHENSIVE STUDY OF EXISTING FLOOD MANAGEMENT SYSTEMS OF JAPAN AND SRI LANKA

PROPOSED RESEARCH ACTIVITIES:

(1). Flood Management Plans
   – National/Prefecture and Municipal level flood disaster management plans

(2). Data Acquisition methods and monitoring systems
   – Water level data
   – Rainfall data
   – Use of available images/satellite imageries

(3). Early Warning
   – The methodology used to disseminate real time early warning to the vulnerable communities
   – The flood forecasting methods used

(4). Evacuation programs
   – Evacuation methodologies used to evacuate the community

(5). River Management Planning
   – Information and technology on river management planning used on flood plain management and flood mitigation

My future expectations....... 

To grow knowledge on,

1. Utilization of satellite image/data for Disaster Management.
2. Emergency disaster observation by satellites
3. GIS applications to Disaster Management.
Thank You for your attention