

COUNTRY PRESENTATION - SRI LANKA

# DISASTER MANAGEMENT IN SRI LANKA

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Sri Lanka

1<sup>st</sup> March, 2011 in Kobe, Japan



## SRI LANKA

- Sri Lanka is an Island
- Location
  - Indian ocean
  - Indian sub continent
  - Latitudes  $5^{\circ}.55'$ - $9^{\circ}.55'$  N
  - Longitudes  $79^{\circ}.42'$ - $81^{\circ}.52'$  E
- Land area : 65,610 sq km
- Maximum Length : 445 km
- Maximum Breadth : 225 km





Tooth Palace- Kandy

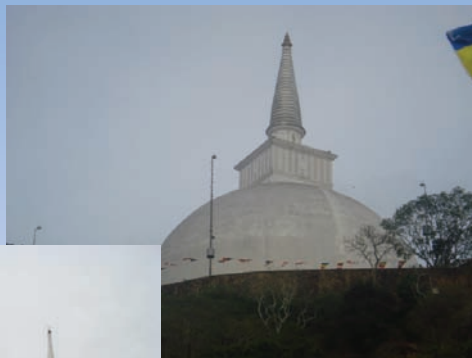


Beautiful Beaches all around the Country





SEEGIRIYA- An ancient Palace on the Top of a ROCK







Water Falls

**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

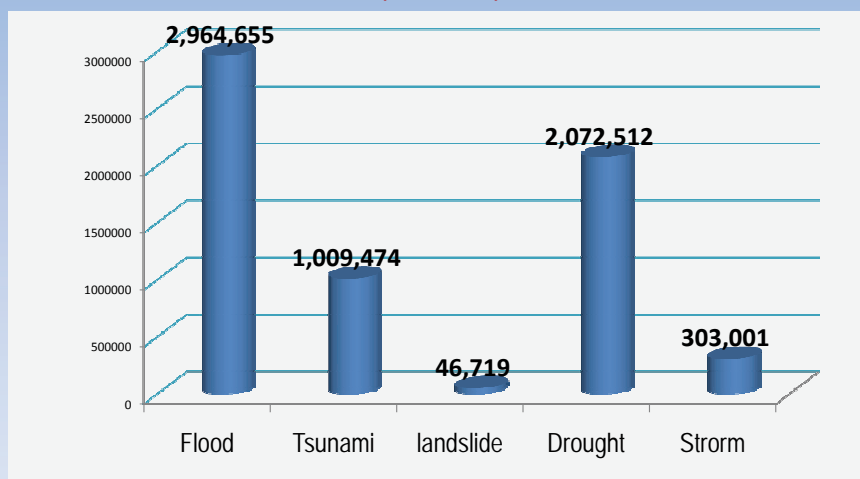
–An outline of natural events of varying national concern

- Floods
- Landslides
- Cyclones
- Drought
- Lightning
- Coastal erosion
- Ground settlements
- Earthquake
- Tsunami



## The Hazard Profile

**N**umber of people affected by different disasters in Sri Lanka  
(1974 – 2008)



NATURAL DISASTERS IN SRI LANKA - 1993 TO 2004				
YEAR	NO. OF DEATHS	DAMAGED HOUSES	NO. OF AFFECTED FAMILIES	EXPENDITURE FOR DISASTERS
1993	36	42,468	237,737	43,726,604
1994	18	52,927	357,333	40,156,807
1995	1	11,707	91,921	55,288,253
1996	13	9,343	216,208	452,002,869
1997	19	3,608	466,153	318,089,287
1998	5	7,937	38,002	106,665,779
1999	9	3,803	167,416	145,994,839
2000	15	86,845	257,682	65,398,998
2001	6	11,445	458,008	506,214,166
2002	02	5,112	20,201	28,389,474
2003	254	37,227	140,310	1,740,153,392
2004	31,723	62400	257625	

Source: Dept. of Social Services

**MAN-MADE DISASTERS** have claimed more than 64,000 lives and it affected to 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

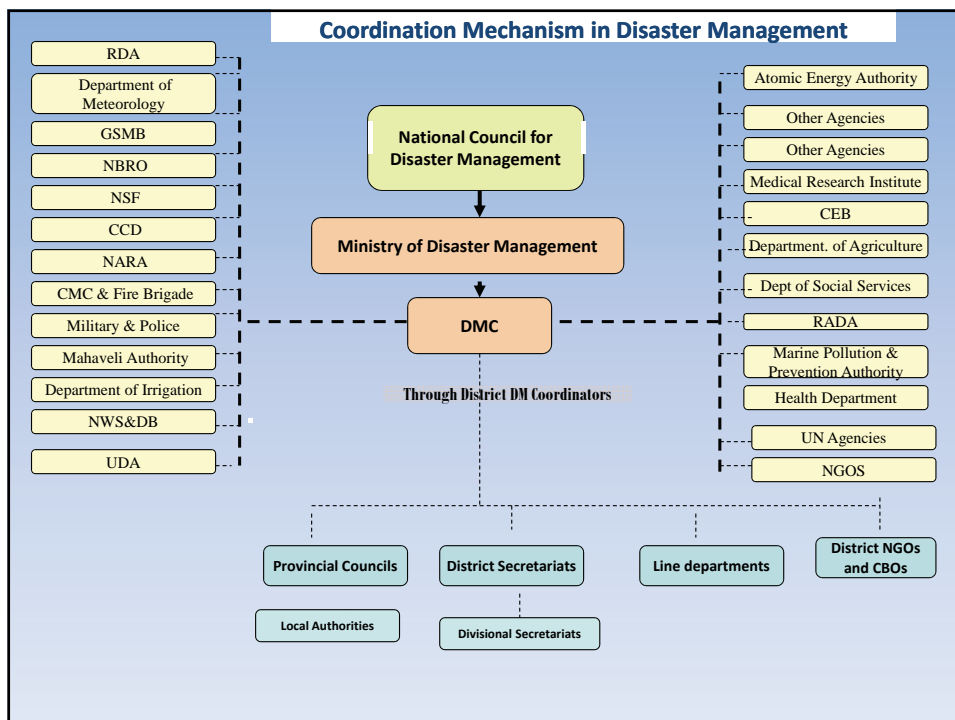
- ❖ Floods and landslides (2003) and various medium to small scale disasters over the past few years have brought back into focus the fact that Sri Lanka is a disaster prone country.
- ❖ Need to strengthen all aspects of Disaster Risk Management (DRM) – both pre-disaster risk reduction as well as post-disaster response mechanisms.
- ❖ Tsunami(2004) has reactivated the urgent need for a DRM legislation in Sri Lanka.

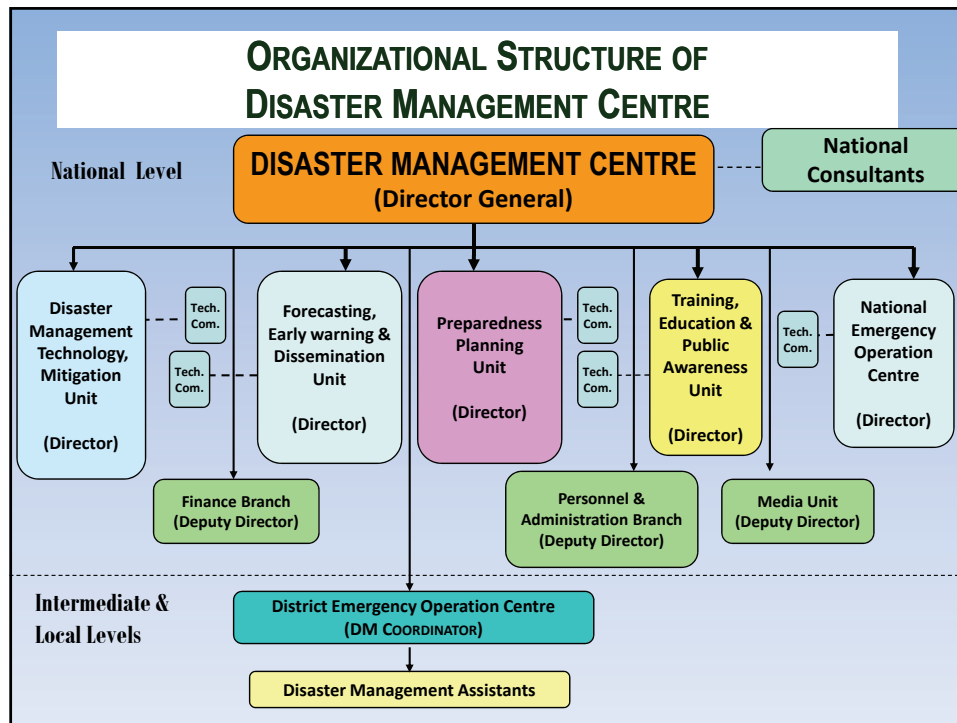


In May 2005, the Government of Sri Lanka passed the Sri Lanka Disaster Management Act No 13 of 2005 in the Parliament.  
DMC was established according to the above ACT



- 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.





### 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:**

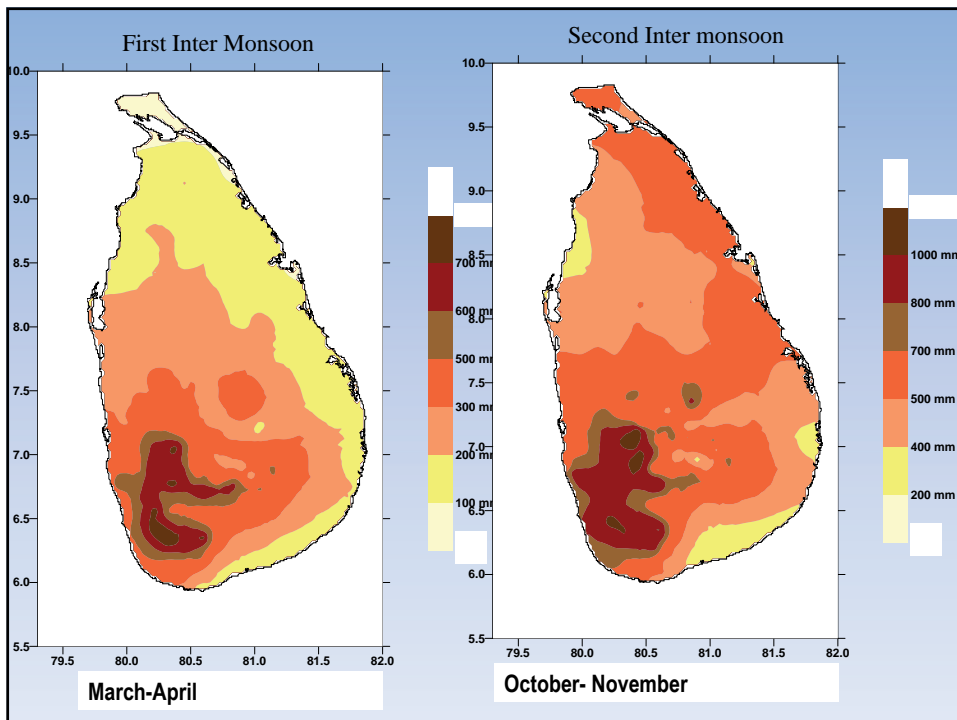
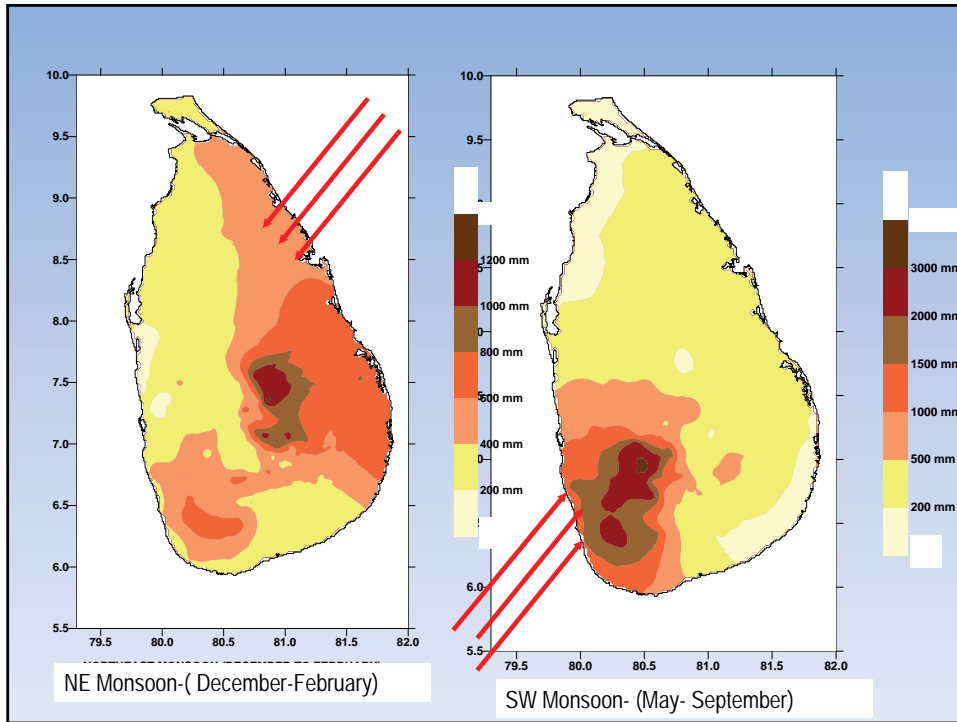
Disaster Risk Management for safer communities and sustainable development in Sri Lanka

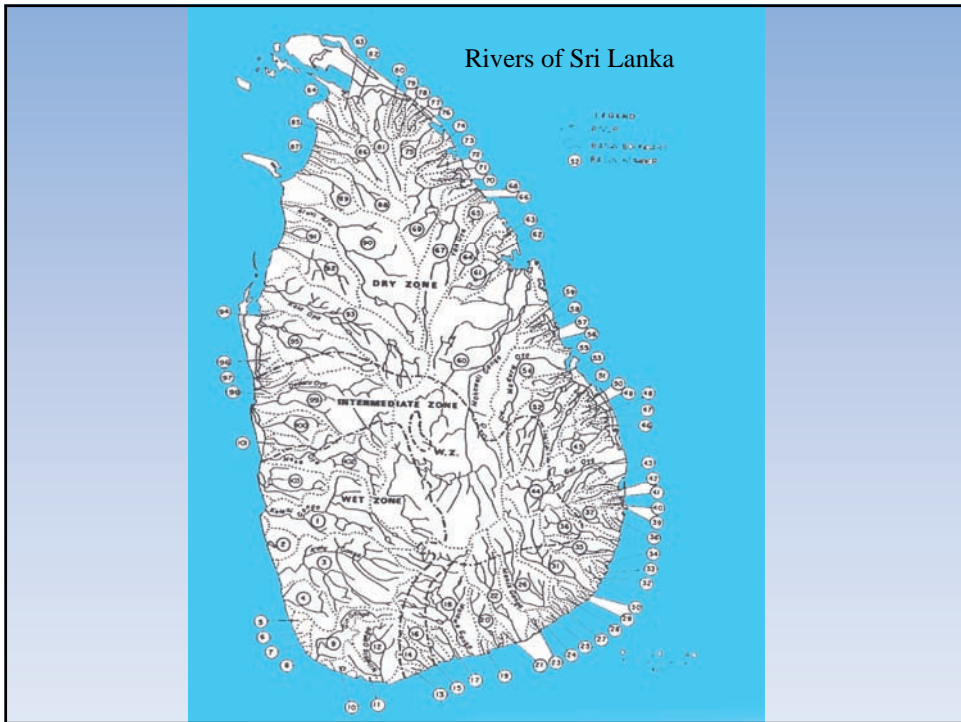
### **The Broad Mission:**

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

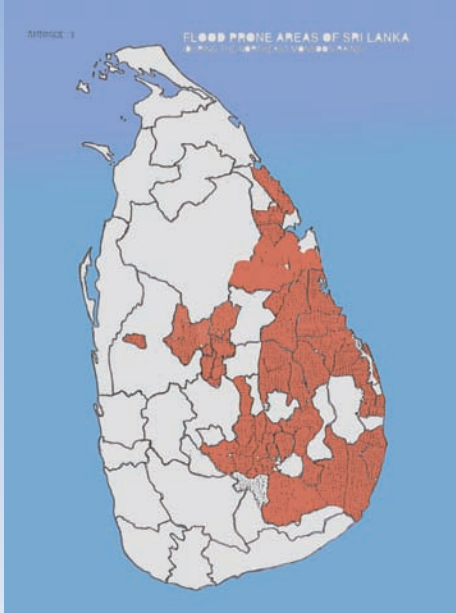
Concentration on major Weather Pattern is important



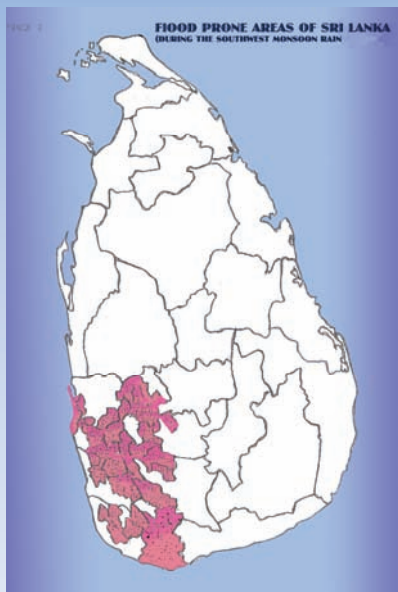


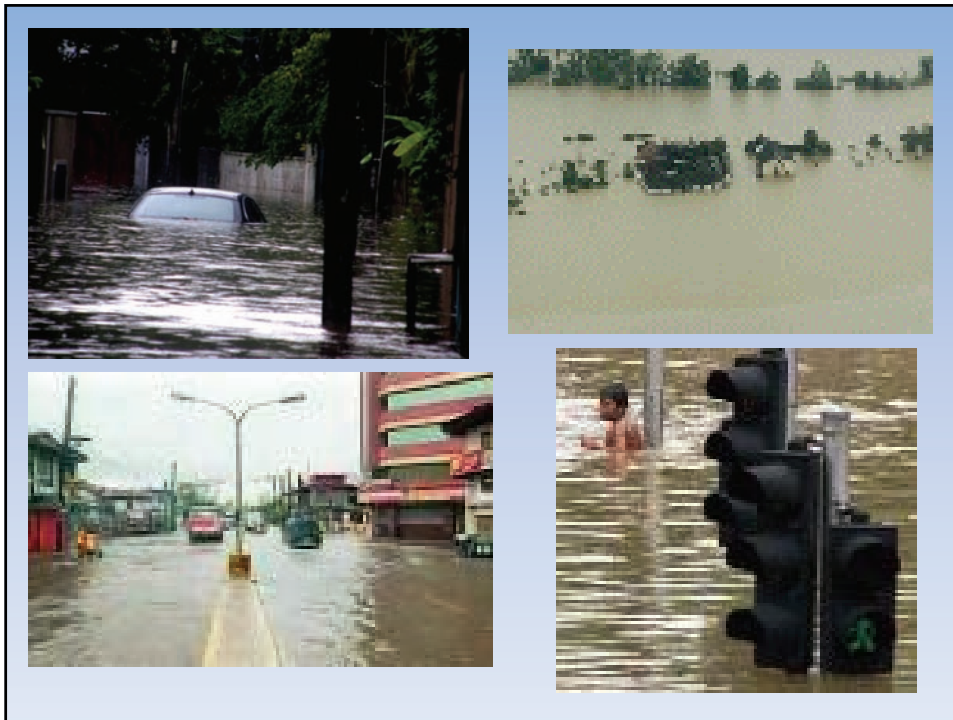


### Floods during the North-East Monsoon



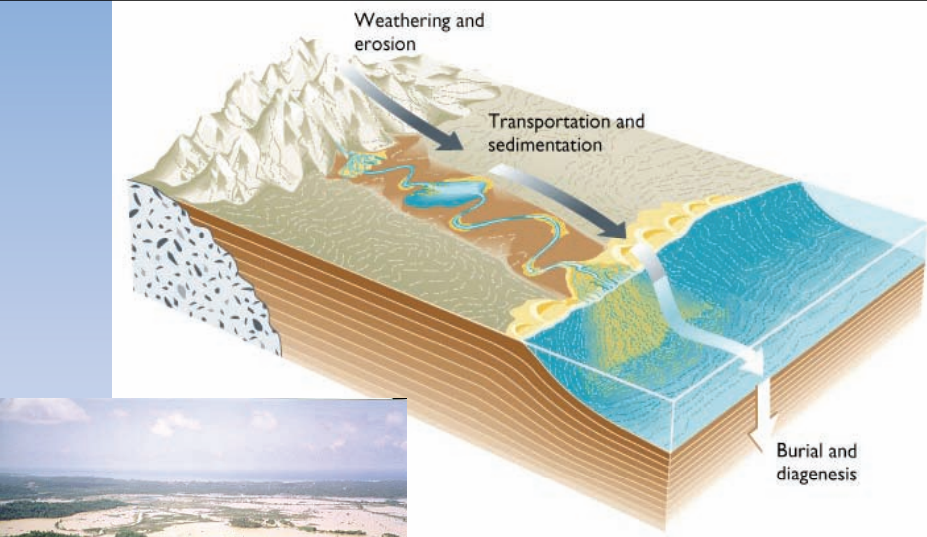
### Floods during the South-West Monsoon





## 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**



Weathering and erosion

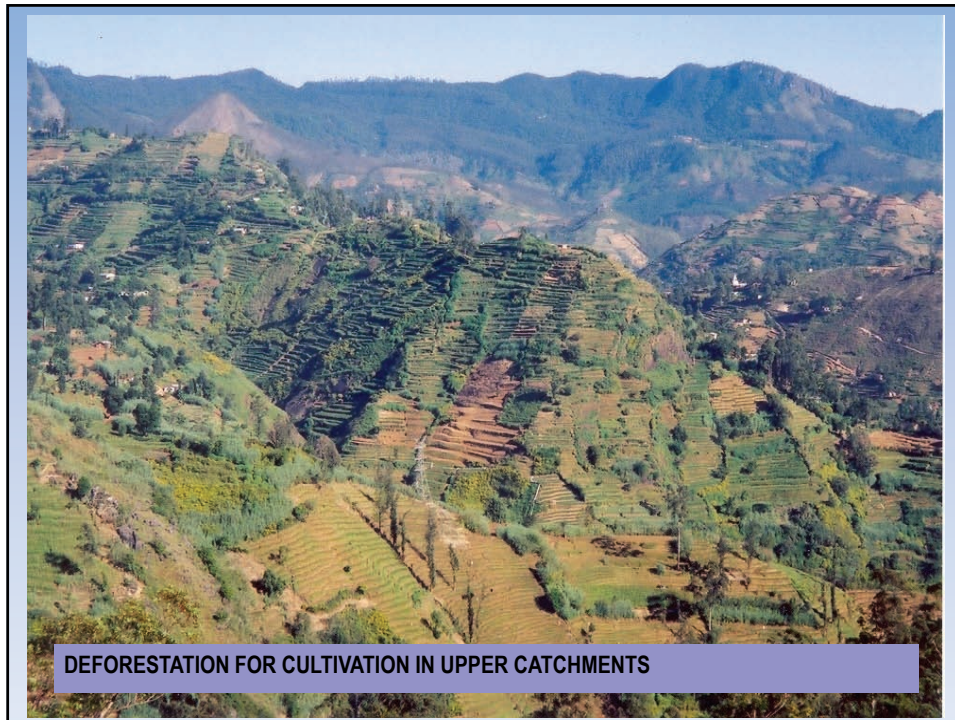
Transportation and sedimentation

Burial and diagenesis

(2) Geo-morphological existence of Sri Lanka-Three penne plains along with steep intermediate slopes







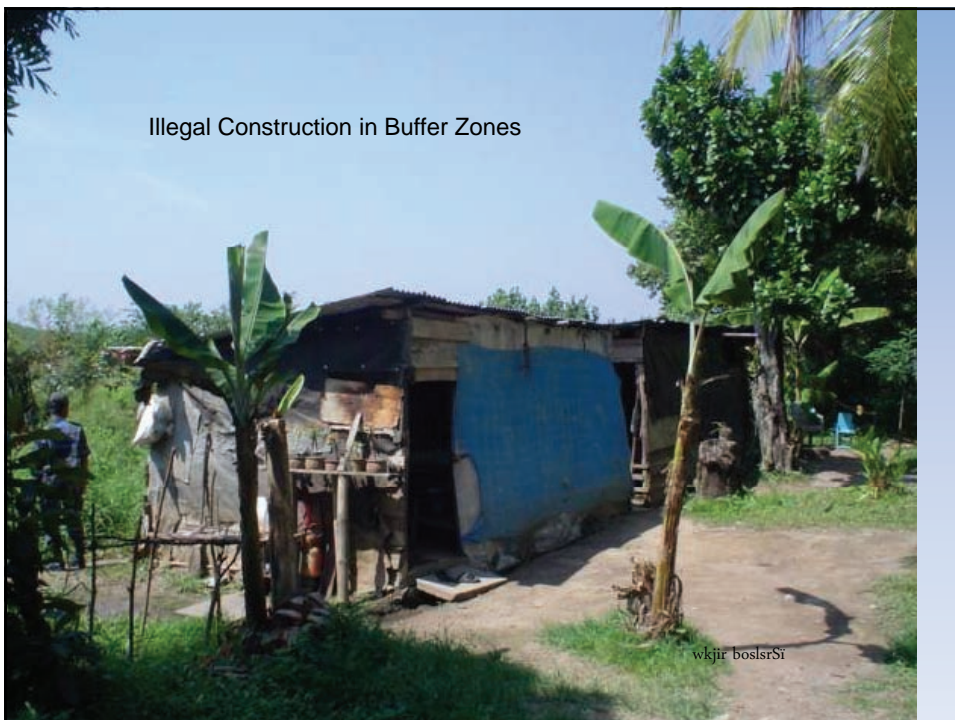
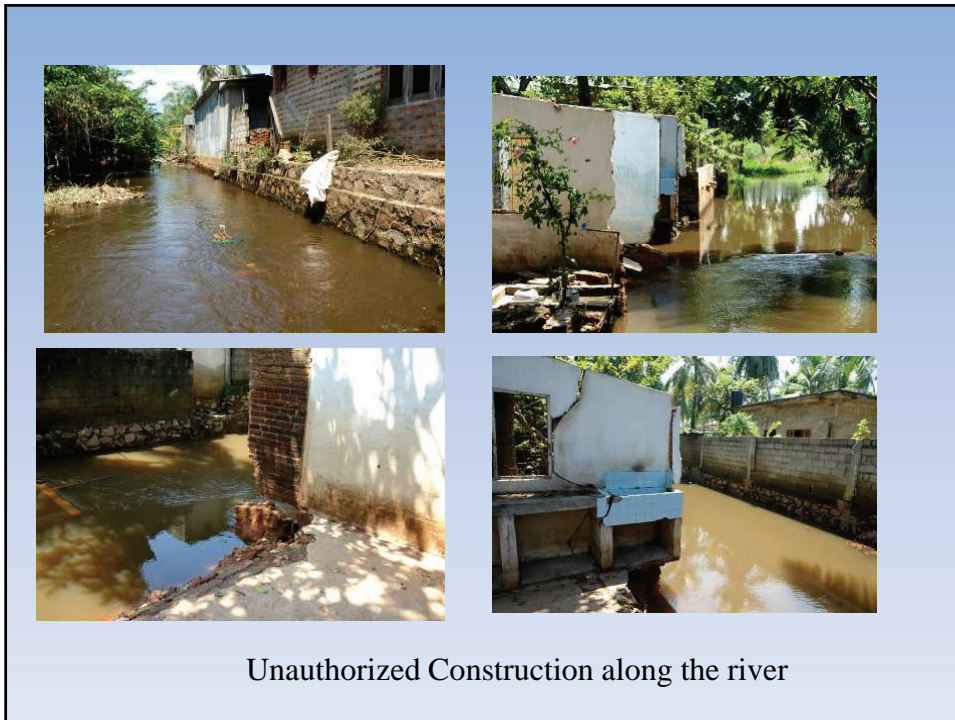


**SEVERE SILTATION DUE TO SOIL EROSION**

**BLOCKING OF WATER WAYS THROUGH INAPPROPRIATE CONSTRUCTION**







## CONSTRUCTION IN BUFFER ZONES



Flooding in Rathnapura



ILLEGAL LAND FILLING

LOW LAND RECLAMATION







### POOR MAINTANANCE OF CANALS



### COUNTERMEASURES

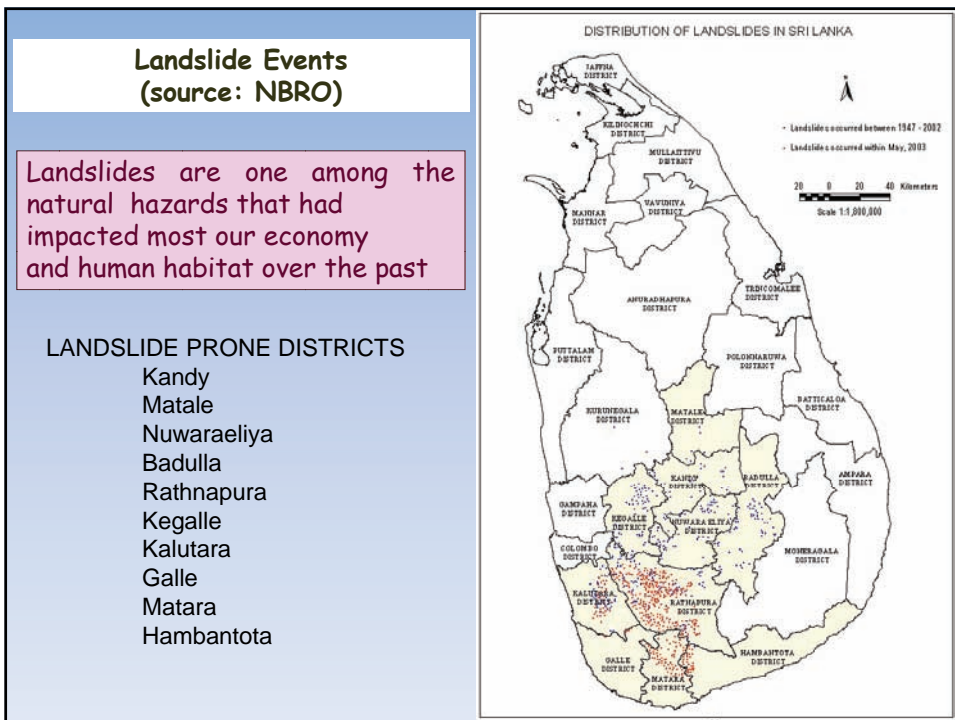


DESILTATION OF LAKES, RESERVOIRS, PONDS TO MINIMISE FLOOD DAMAGE





IMPACTS OF LANDSLIDES ON THE HILLY TERRAINS IN SRI LANKA





**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**

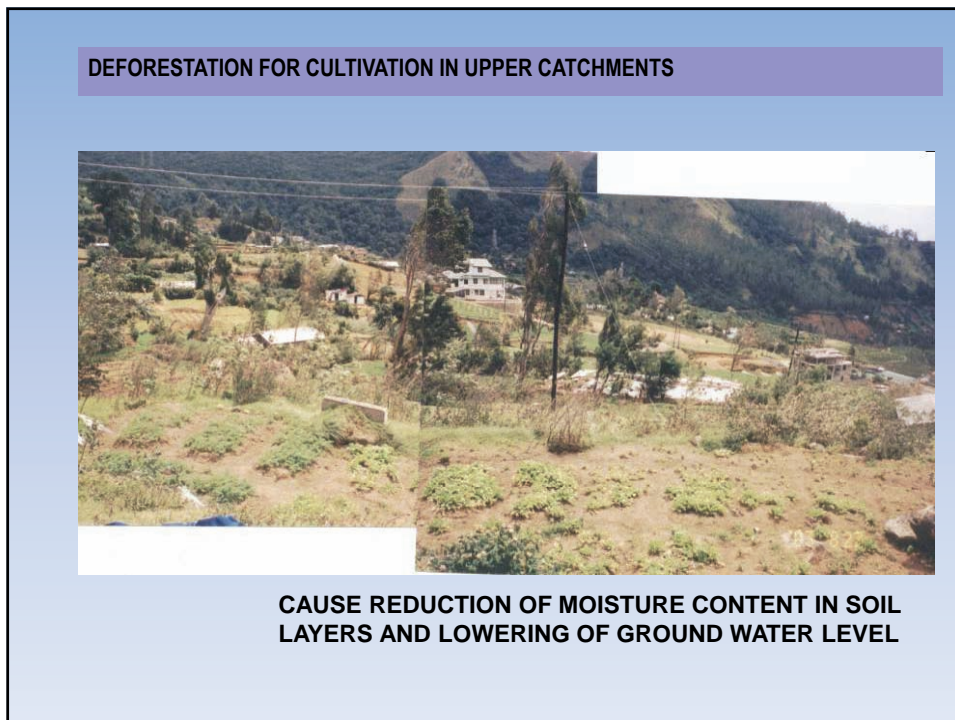
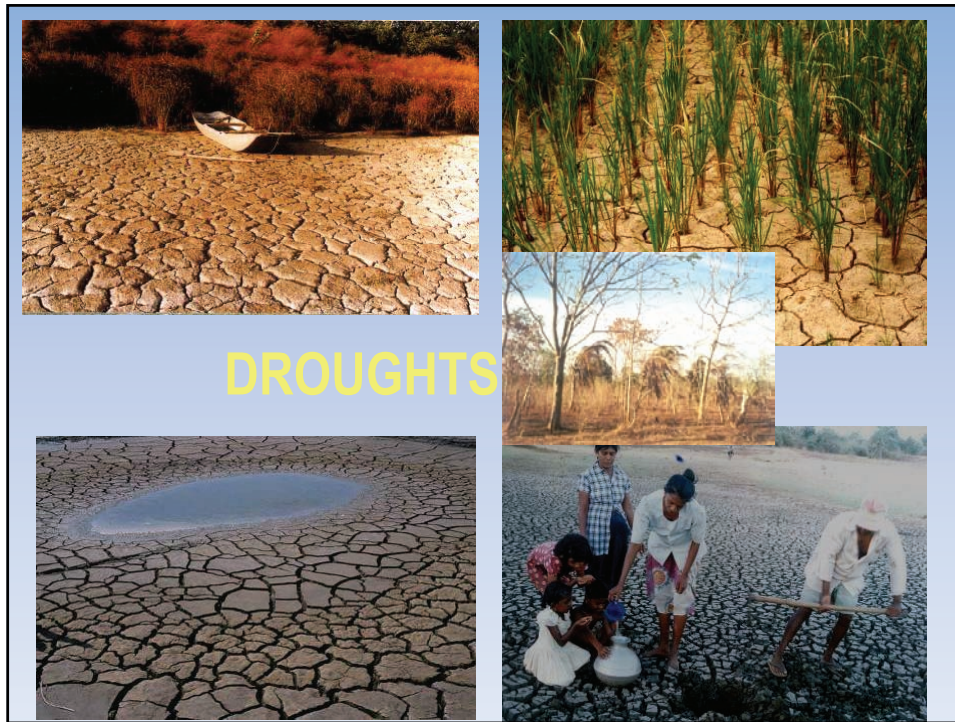
**negligence of land**

### **IMPACTS ASSOCIATED WITH LANDSLIDES**

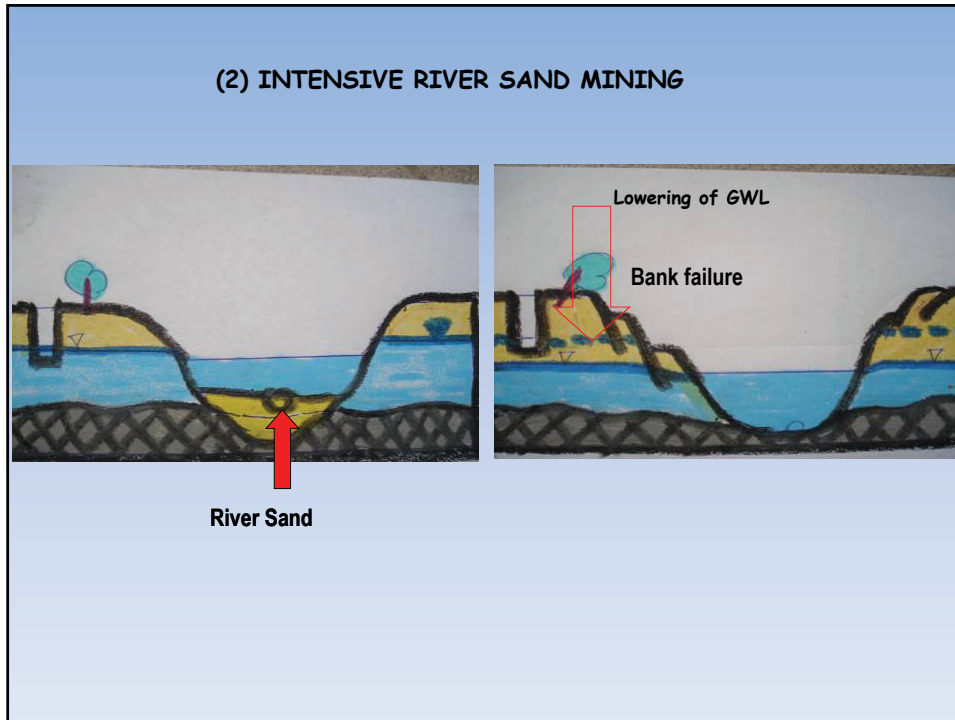
- Danger to life, property and infrastructure
- Soil erosion
- Increase of Sedimentation
- Flooding
- Impacts on agriculture
- Damage to forest cover and wildlife
- Social impacts (eg. Livelihood)

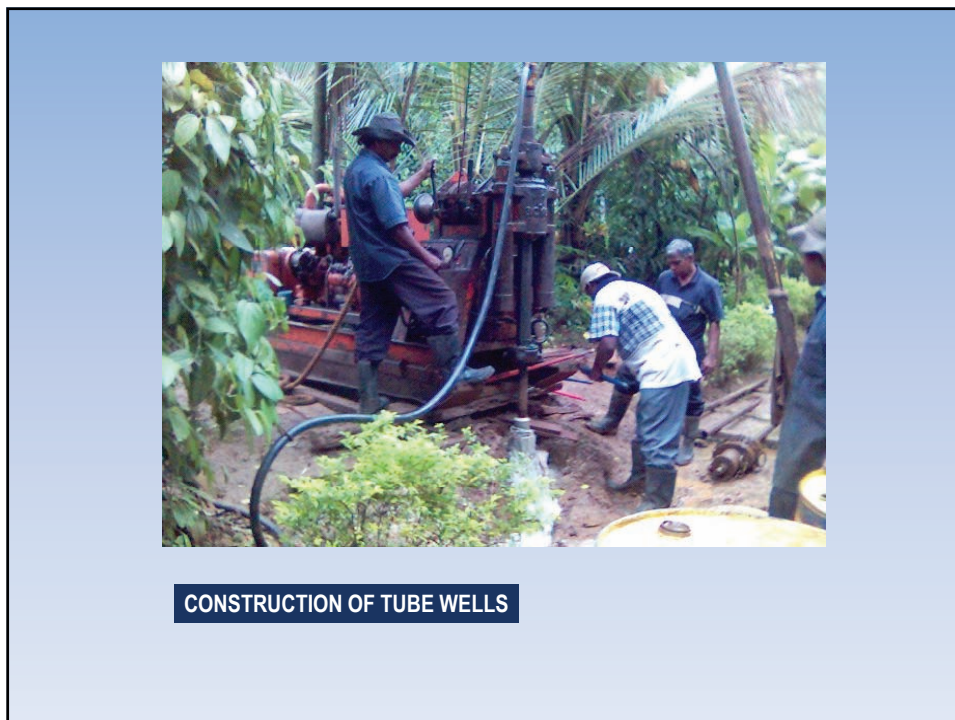
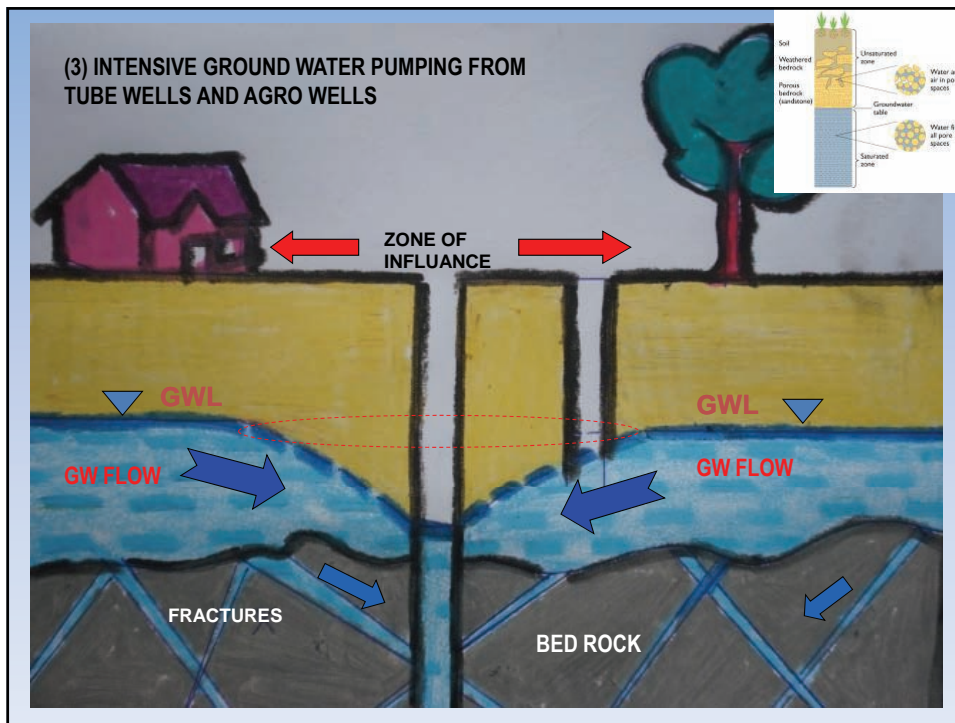
### **ACTION TAKEN TO MANAGE LANDSLIDE IMPACTS**

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





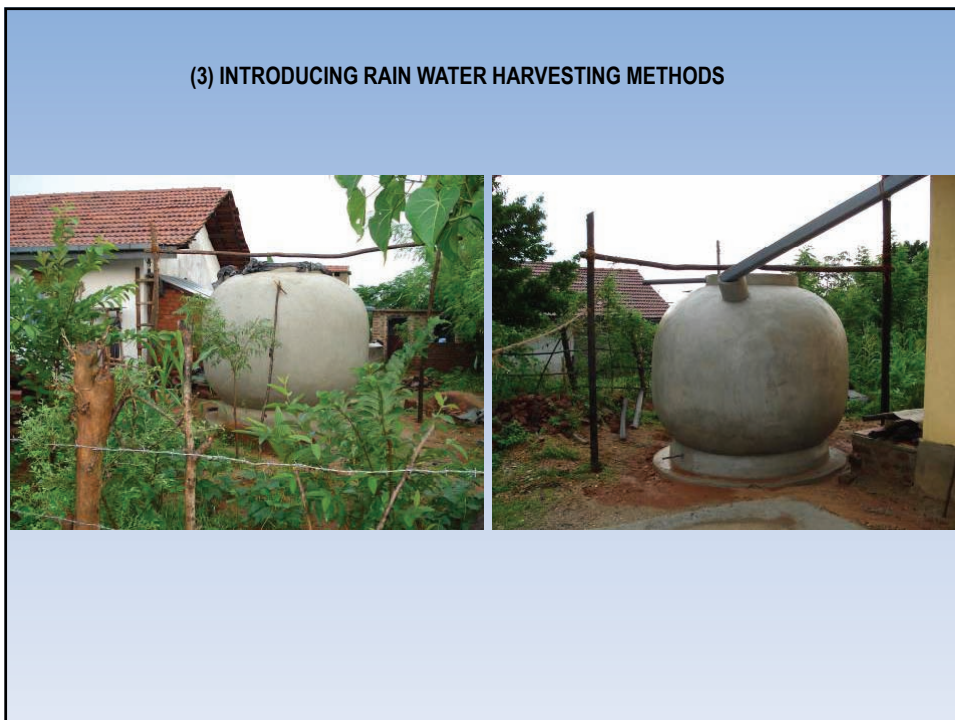






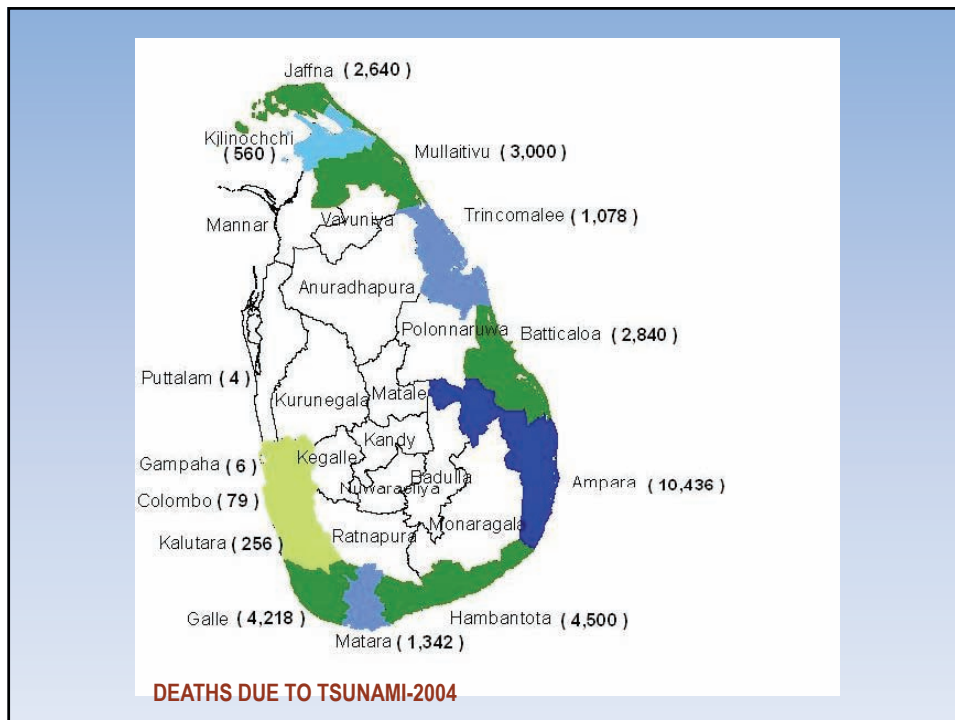
# MITIGATION OF DROUGHTS











## Earthquakes

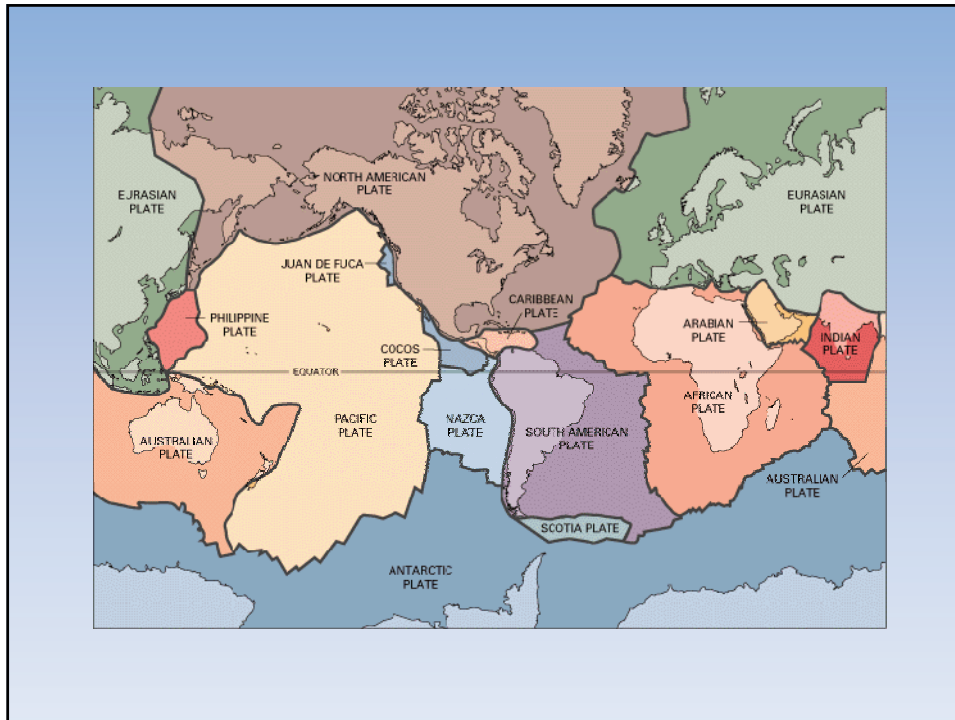
- Reported earthquakes:  
14<sup>th</sup> April, 1615 – no. of deaths 2000  
Minor earthquakes in  
1938,1993,1999,2000,2004,2009 and 2010

Source: Earth and Environment

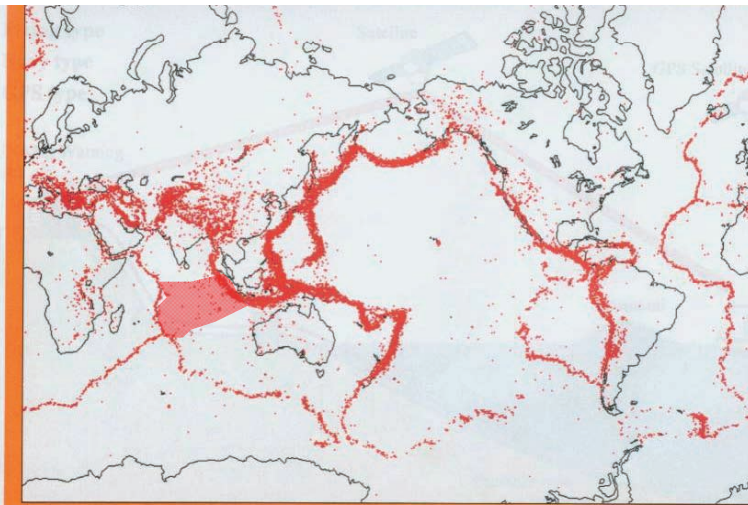
by Prof. Rohana Chandrajith and

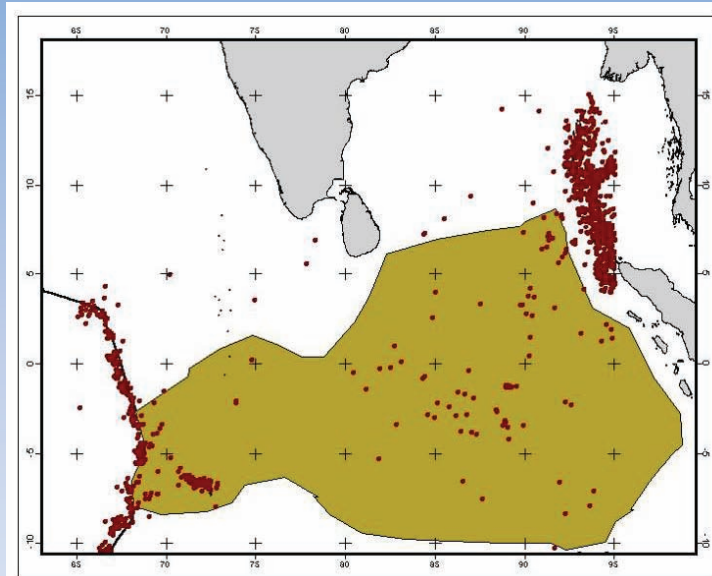
Prof. C.B.Disanayake

(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

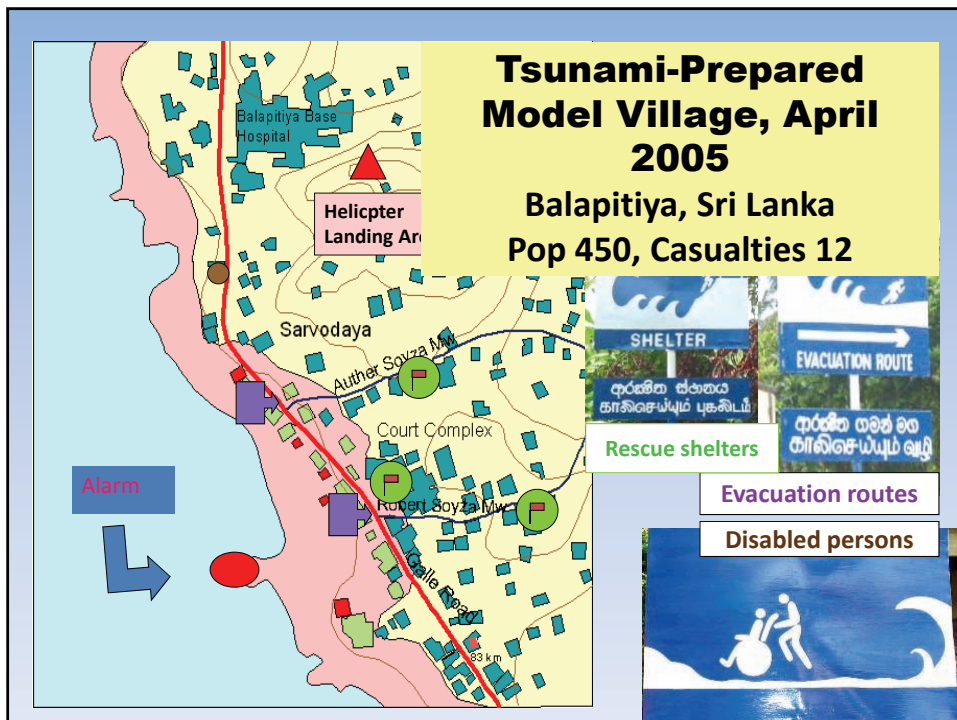
- Monitoring System through Instruments and Equipments
  - E.g. Buoy, Seismographs
- Data from Satellite Network and transmission stations
- Standby Monitoring staff
- Early Warning Systems
- Communication network
- Monitoring of behavior of sea currents

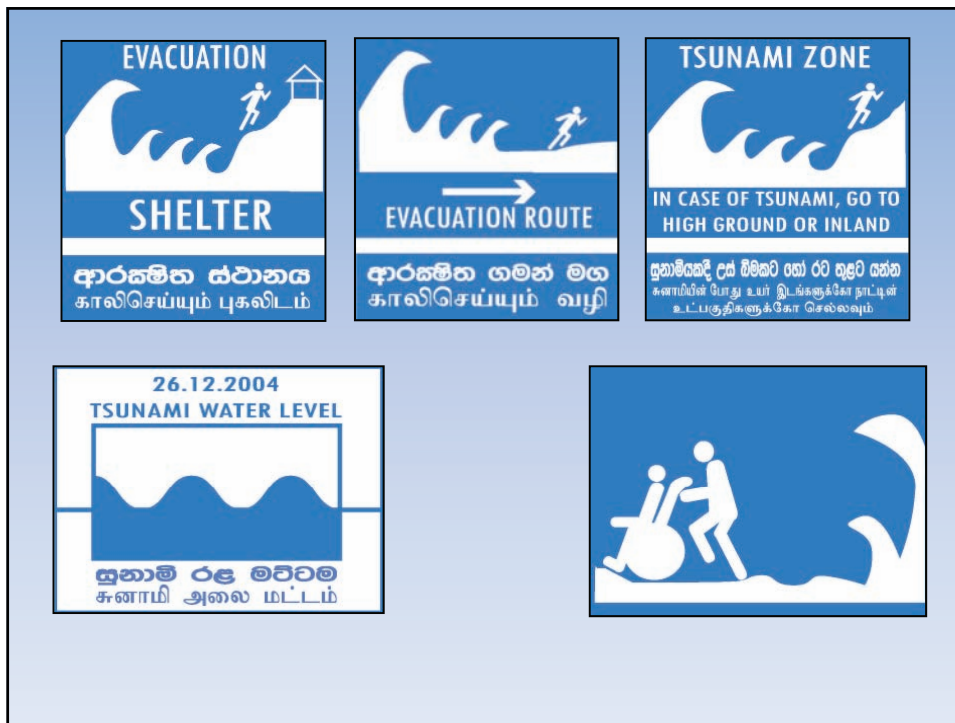




## 2.Preparedness for Evacuation

- Evacuation plans and procedures
- Previously identified places for evacuation
- Evacuation structures with suitable structural designs
- Signboards
- Conducting mock-drills for Tsunami evacuation





**wdo<sup>3</sup>/<sub>4</sub>Y .iudk wxl 1)n,msáh**



### **3. Mitigation**

- Constructing Wave breakers and barriers

### **4. Public awareness programs**

- Occurrence of Earth quakes
- 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.

