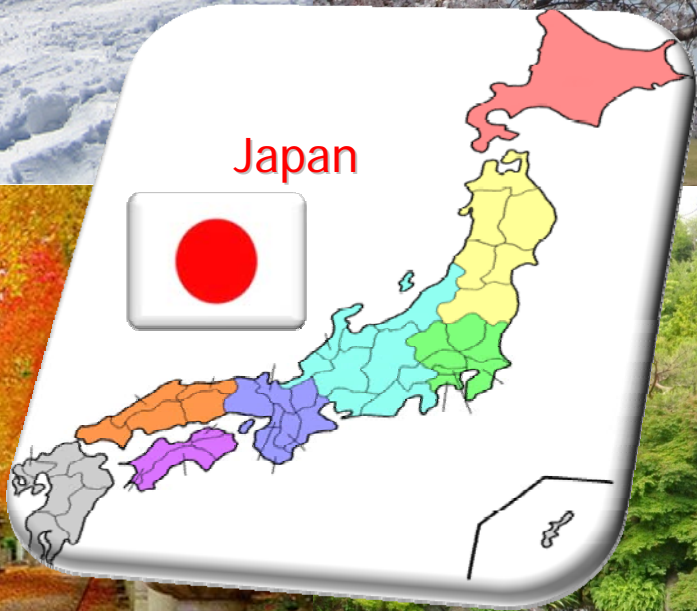
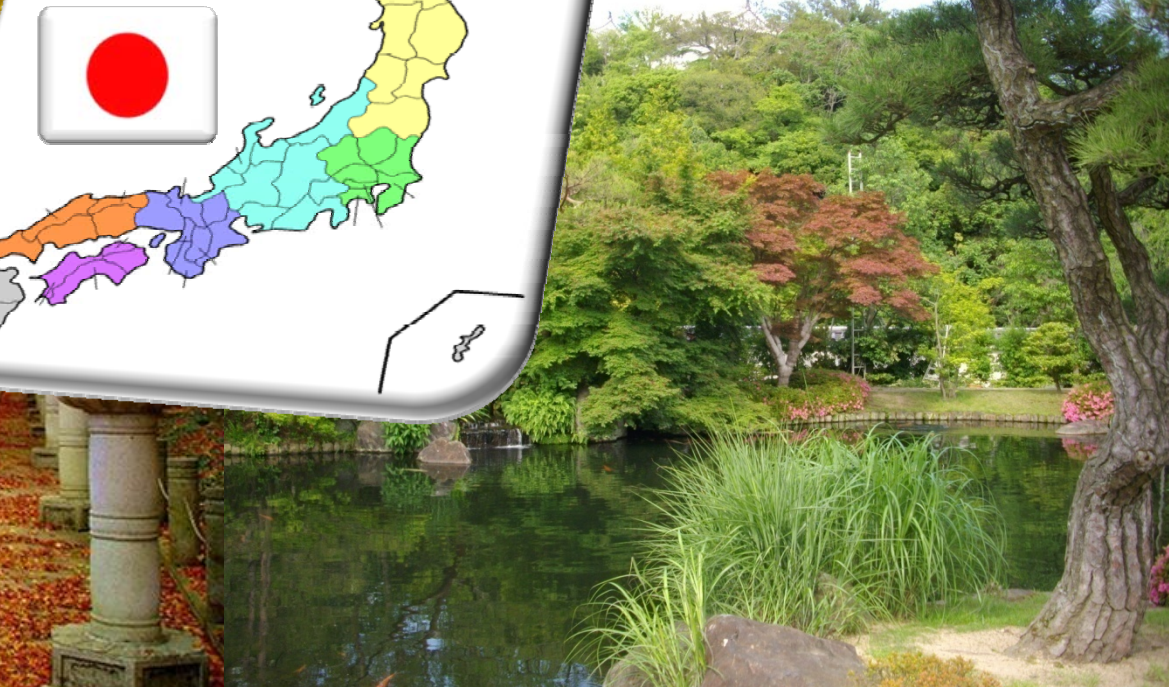


Final Presentation
By
Pradeep Kodippili
Assistant Director
Disaster Management Center
Sri Lanka.

*Comparative Study on
Disaster Management
in the Japan and Sri
Lanka.*

09-October 2009





இலங்கை - Sri Lanka




இலங்கை





Major Natural Disasters in Sri Lanka

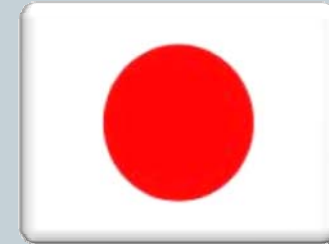
- ❖ Floods
- ❖ Cyclones
- ❖ Landslides
- ❖ Droughts
- ❖ Cyclonic storms
- ❖ Tornados

- 
- ❖ Lightning
 - ❖ Sea Erosion
 - ❖ Sea Surge
 - ❖ Tsunami
 - ❖ Epidemics
 - ❖ Animal Attacks

Natural Hazards in Japan



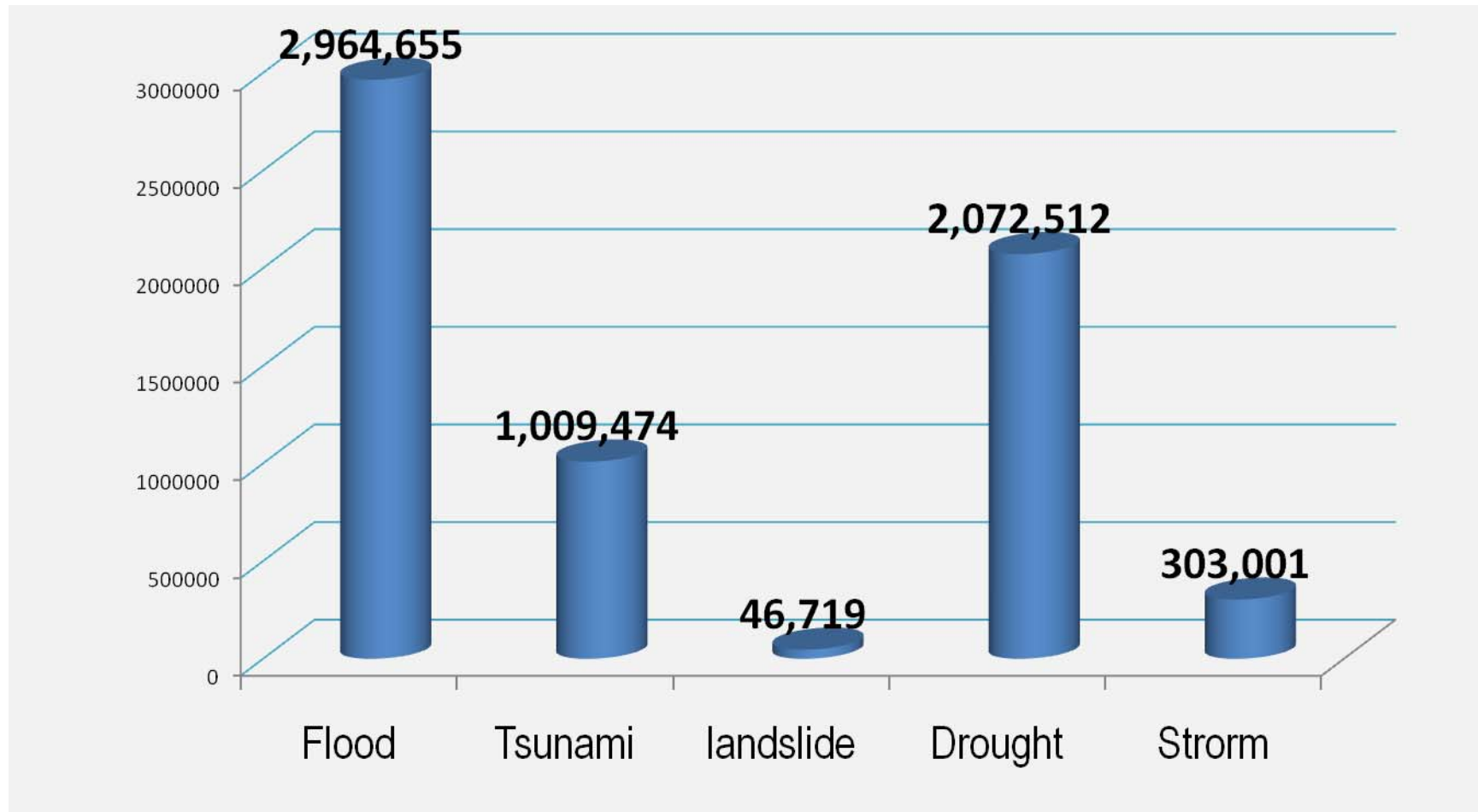
- Earth Quakes
- Tsunami & Sea Tides
- Typhoons
- Torrential Rains & Floods
- Heavy Snow Fall
- Volcanoes
- Storm Damage





The Hazard Profile

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





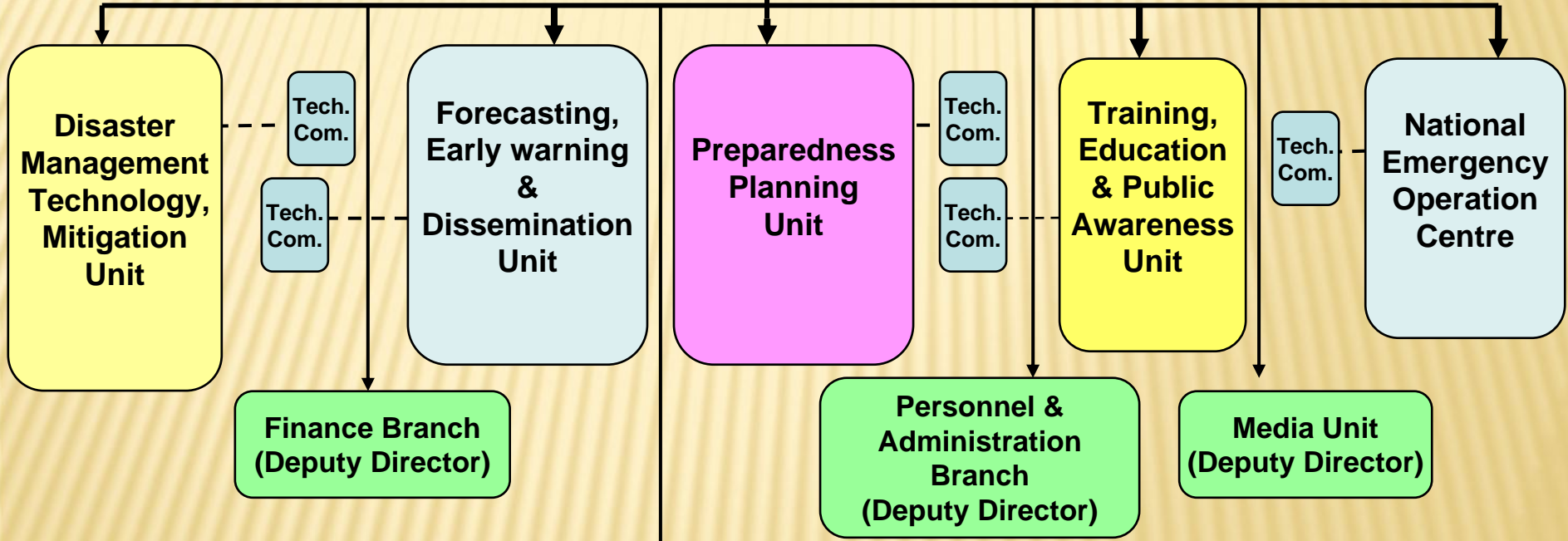
Organizational Structure



National Level

**Disaster Management Centre
(Director General)**

**National
Consultants**



Intermediate & Local Levels

**District Emergency Operation Centres
(DRM Coordinators)**

Disaster Management Assistants

Disaster Management System in Japan



National Level

Priminister

Central Disaster Management Council

Formulation and promoting implementation of the Basic Disaster Management Plan.

Designated Government Organizations & Designated Public Corporations

Formulation and implementation of the Disaster Management Operation Plan.

Prefecture Level

Governor

Prefecture Disaster Management Council

Formulation and promoting implementation of Local Disaster Management Plan.

Designated Local Government Organizations

Designated Local Public Corporations

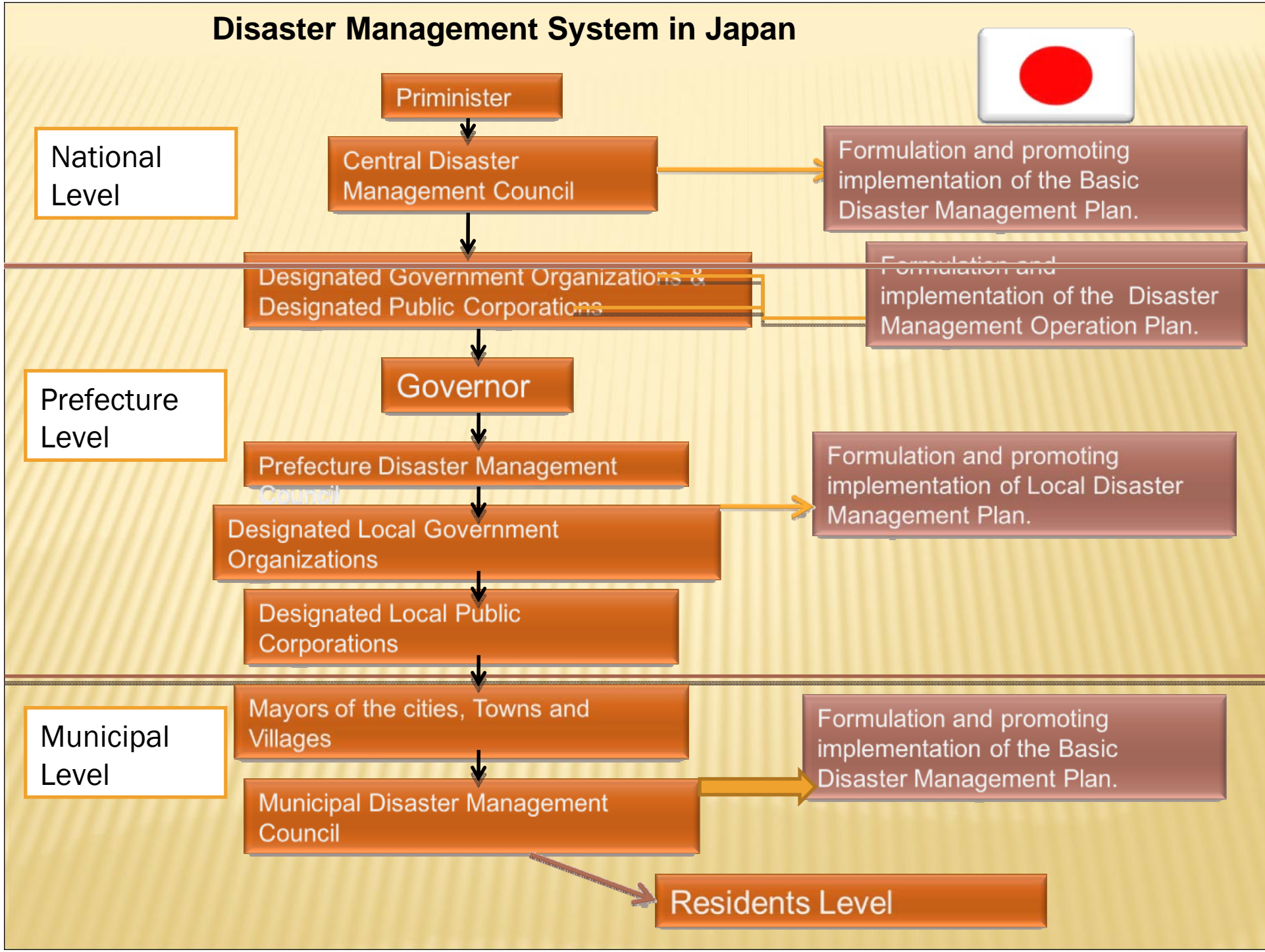
Municipal Level

Mayors of the cities, Towns and Villages

Formulation and promoting implementation of the Basic Disaster Management Plan.

Municipal Disaster Management Council

Residents Level





Floods





FLOOD MITIGATION – IN SRI LANKA

2008 DATA



District	No of Projects	Total Allocation Rs (Mn)
Colombo	08	44.42
Gampaha	03	28.7
Kalutara	07	30.505
Hambantota	01	26
Puttalam	01	2.25

MITIGATION ACTIVITIES – FLOOD PREVENTION IN SRI LANKA



DESILTING AND CLEARING THE INLET & OUTLET OF MUTWAL TUNNEL



BADDEGEDARA WATTA ROAD



Safe Evacuation Routes

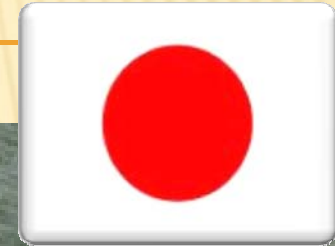


RATHNAPURA



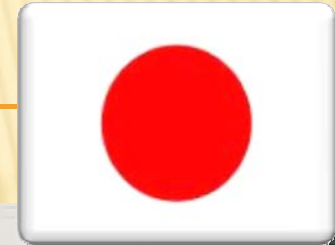
FLOOD IN JAPAN

Okazaki, 230 km west of Tokyo August 29,
2008



Okazaki, 230 km west of Tokyo August 29,
2008

FLOODS IN JAPAN



**Occurrence of widespread
submergence at the underground
facilities in urban areas**





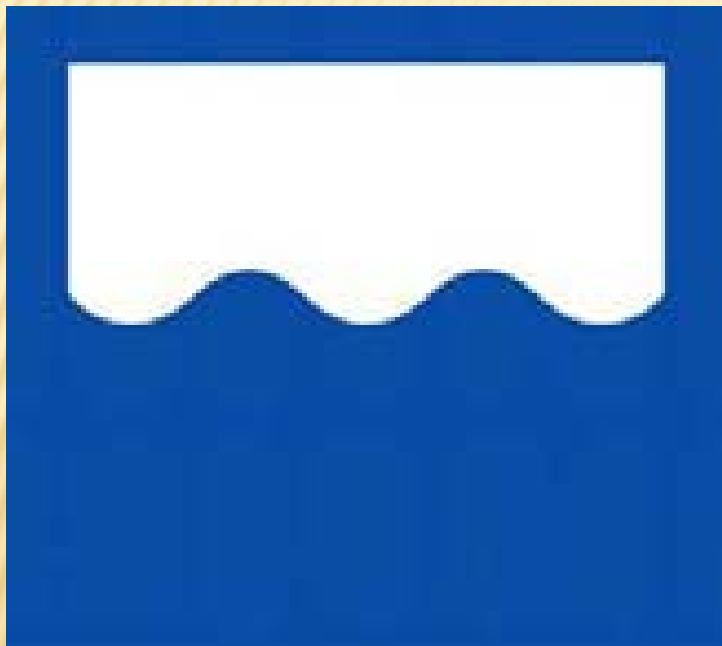
Major Rivers in Japan

River name	Length of the major flow (km)	Drainage area (km ²)
1 Shinano river	367	11900
2 Toyo river	322	16840
3 Ishikari river	288	14330
4 Teshio river	256	5590
5 Kitakami river	249	10150
6 Abukuma river	239	5400
7 Kiso river	229	9100
8 Mogami river	229	7040
9 Tenryu river	213	5090
10 Agano river	210	7710



Most rivers in Japan are steep with short distance from the source to the sea, resulting in rapid flow. Furthermore, most of urban areas are located in low-lying areas below high water level. Population and city functions are concentrated in areas

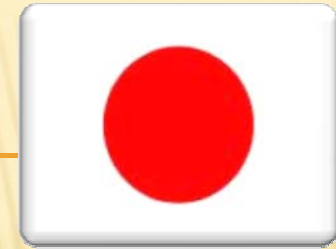
FLOOD MITIGATION IN JAPAN



levee construction

FLOOD MITIGATION IN JAPAN





Silting of the Rivers are very low due to Proper managed garbage disposal system.

ENCROACHMENT IS A BAD POINT FOR FUTURE FLOODING (SHIRONOSHITA – DORI 3)



DROUGHT



- ❖ Regionally significant drought occurs once in about every 3 - 4 years
- ❖ Severe drought occurs once in about 10 years



DROUGHT MITIGATION



District	Unit	Total Allocation Rs (Mn)
Kandy	50 Tanks	1.269
Hambantota	70 tanks	2.487
Kalutara	03 projects	10.7
Deraniyagala	01	10
Total		23.456

MANIKGODA ELA PROJECT



MORE
THAN
500
FAMILIE
S
BENEFIT
FROM
THIS



AGALAWATTA WATER TANK



MORE
THAN
300
FAMILIE
S
BENEFIT
FROM
THIS



UDAWELA WATER TANK



DROUGHTS IN JAPAN



- Uncertainty of rainfall
- Uneven distribution of fresh Water
- Climate Change



EARTH QUAKES IN SRI LANKA

On the evening of April 14th, 1615, a strong earthquake struck Sri Lanka

200 houses collapsed.
killing 4 persons.

Deep fissures opened in the earth, flames and sulphur are said to have been emitted from these fissures. It is thought that 2000 persons were killed in and around Colombo as a result of this earthquake.

Earthquake



Walapane – Hanguranketha - 2007



18:50PM



18:50PM

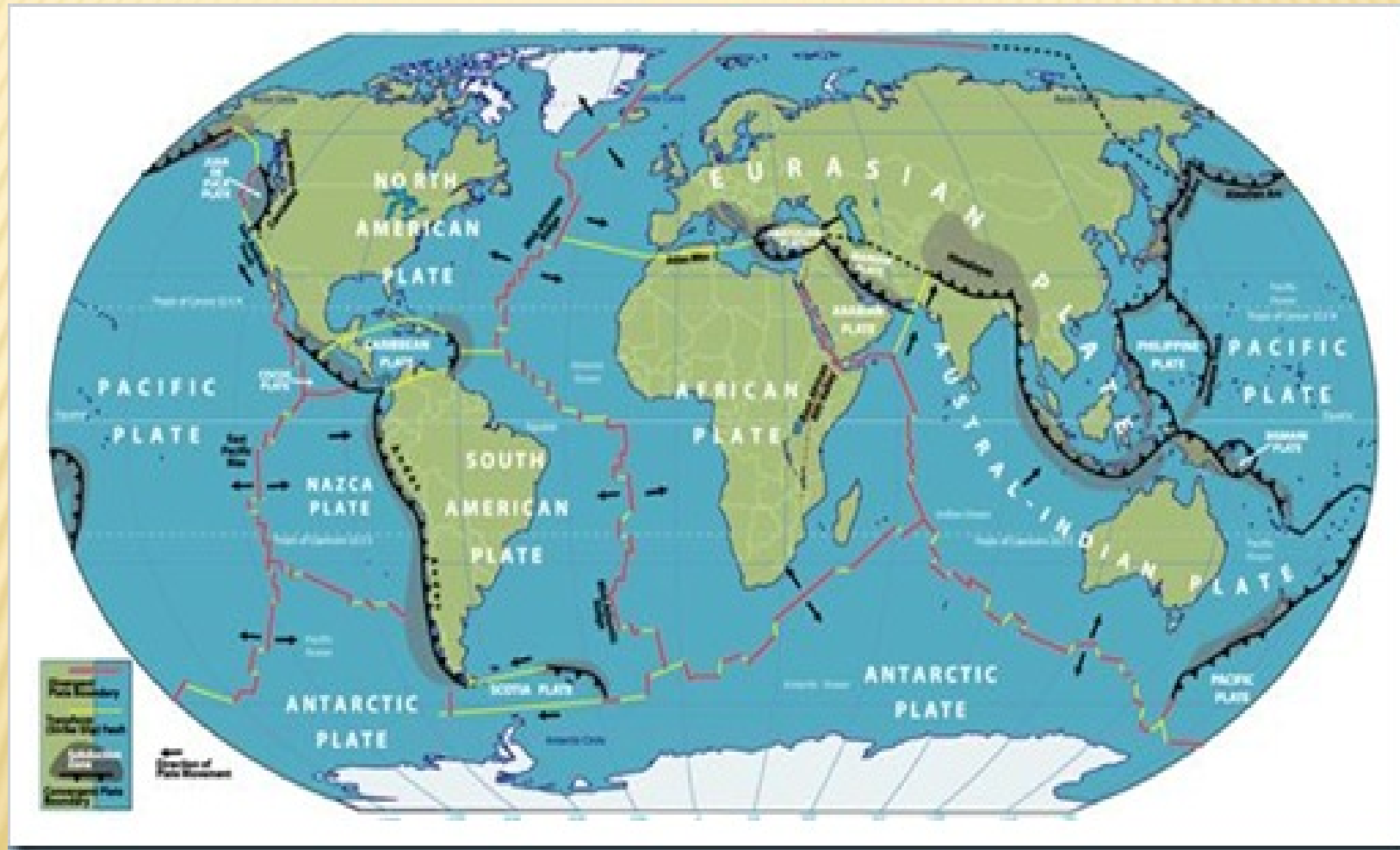
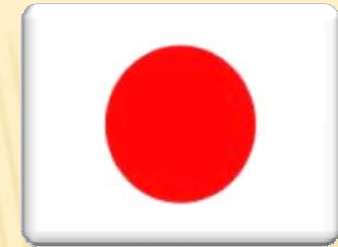
Wathumulla -2007

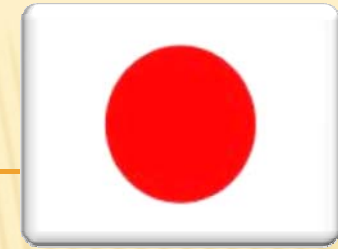
Building Codes as to Mitigate the Damage



Disaster Management Centre has established a Committee for Development of Guidelines for Construction in Earth Quake tremor Prone Areas.

Erath Quakes In Japan





MITIGATION ACTIVITIES FOR EARTH QUAKES

1. New Building Codes were applied in 1984
2. Continuous Research activities on the new building codes.
3. Researches on the Earth Quakes
3. Disaster Awareness to the public (Hazard Mapping/Town Watching)
4. School/University Disaster Educational Programs
5. International relationship to share the knowledge.

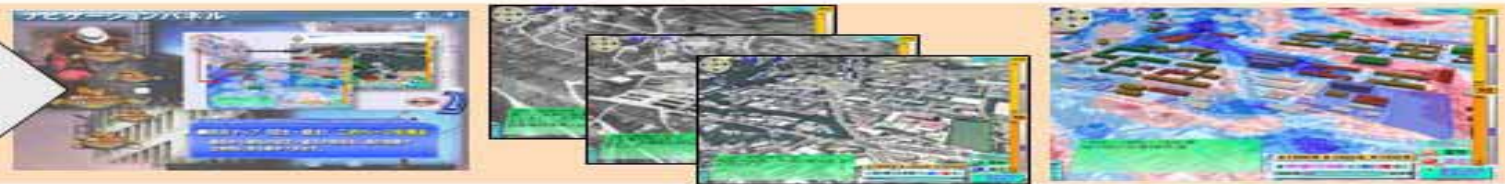




How will my house be shaken during EQ ?
Ground condition and shaking intensity



Why is the ground so shaken ?
Historical changes in topography



Is my house all right ?
Simulation of building collapse and furniture falling



How can I improve my house ?
Basis of seismic retrofit of houses and indoor safety



How can I make my house safer ?
Knowledge and education for disaster mitigation



How much potential does the community have to prevent disasters ?
Making of hazard maps and holding of workshops



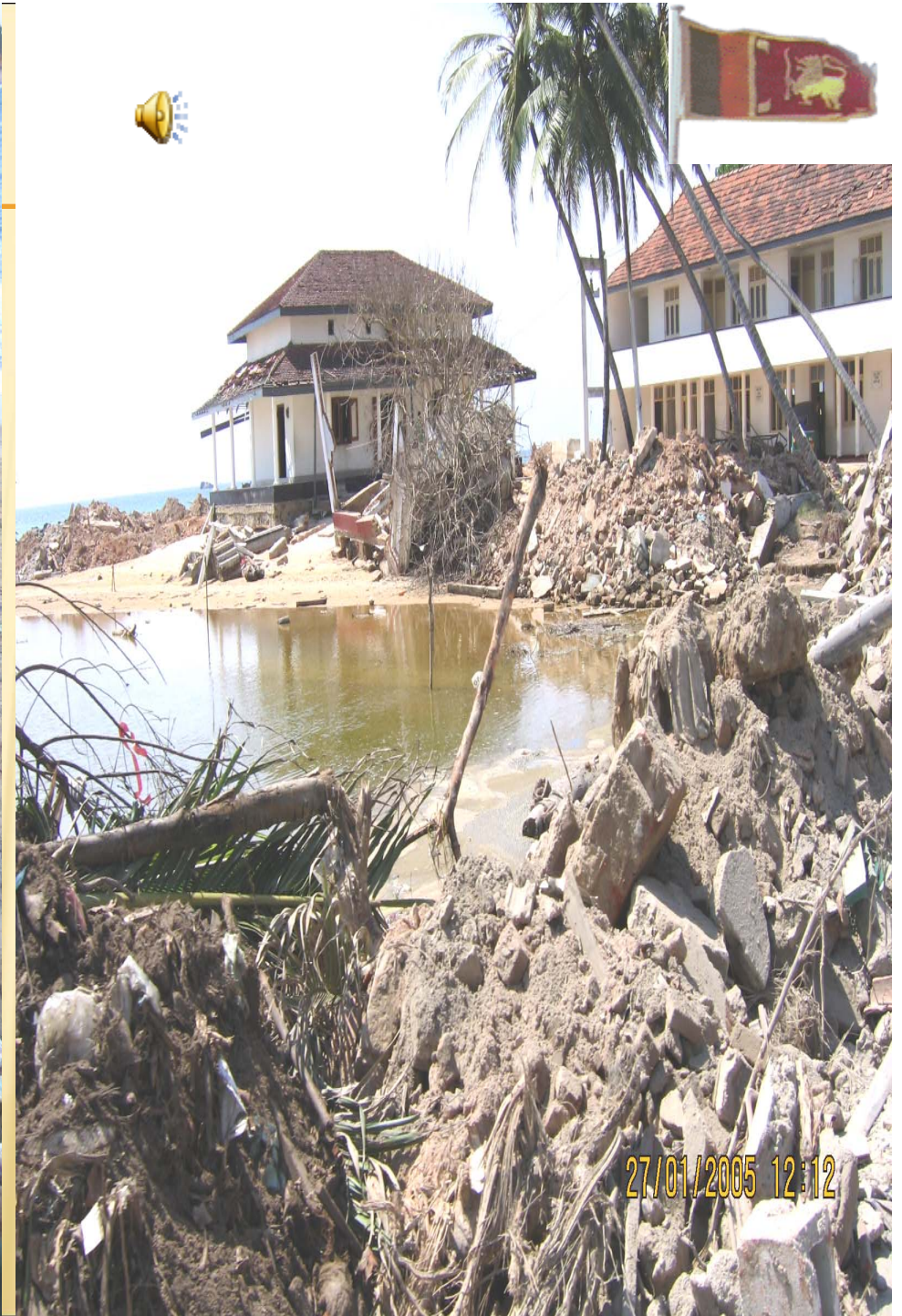
Carry out disaster mitigation practices with local characteristics !

Tsunami 2004



- ❑ Southern, Western, Eastern and Northern coastal belt is prone to Tsunami
- ❑ The unprecedented havoc caused by Tsunami had devastated two thirds of the coastal belt of Sri Lanka.
- ❑ More than 35,000 lives were lost and 100,000 houses were completely damaged in thirteen districts along the coastal belt. Approximately 5,000 people were missing.



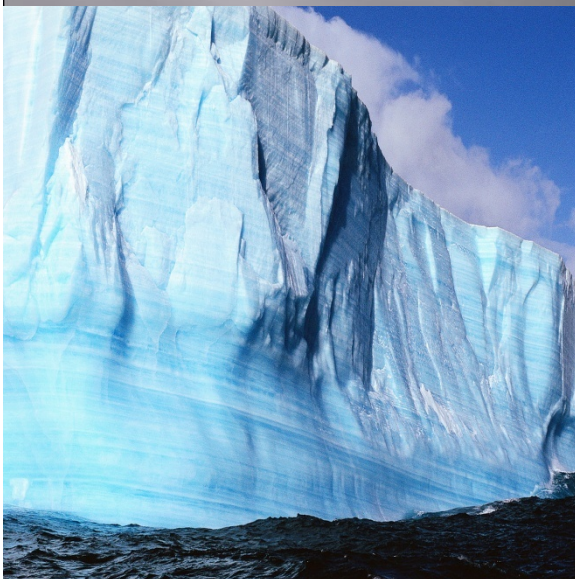
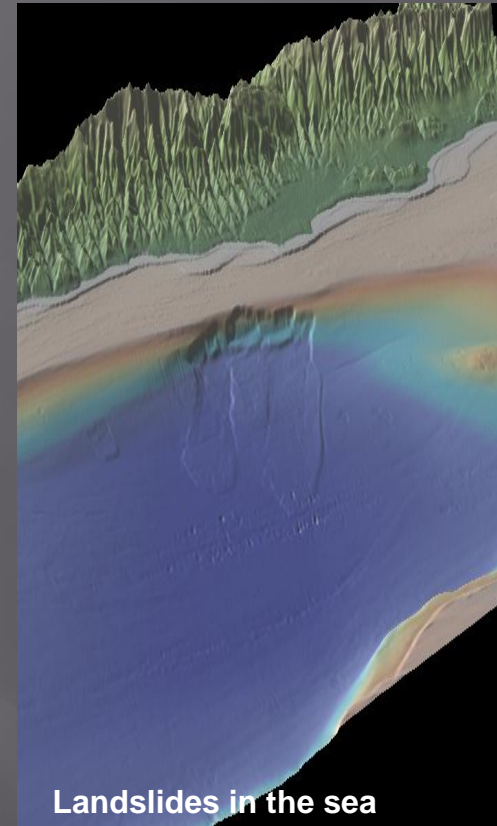




Tsunami in Payagala



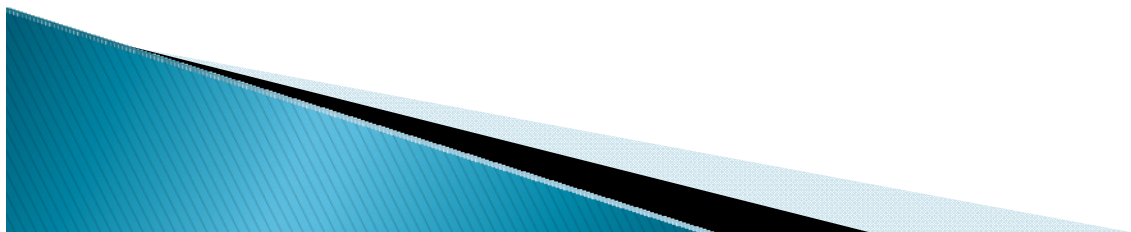
What Causes to Tsunami and Stom Surge





Establishment of Natural Barriers along the coast

District	Place	Total Allocation Rs (Mn)
Colombo	Moratuwa	2.479
Matara	Weligama	0.342
Puttalam	Chilaw	0.65
Total		3.421



Planting of trees along the coast.. –Moratuwa & East Coast



Natural Barriers



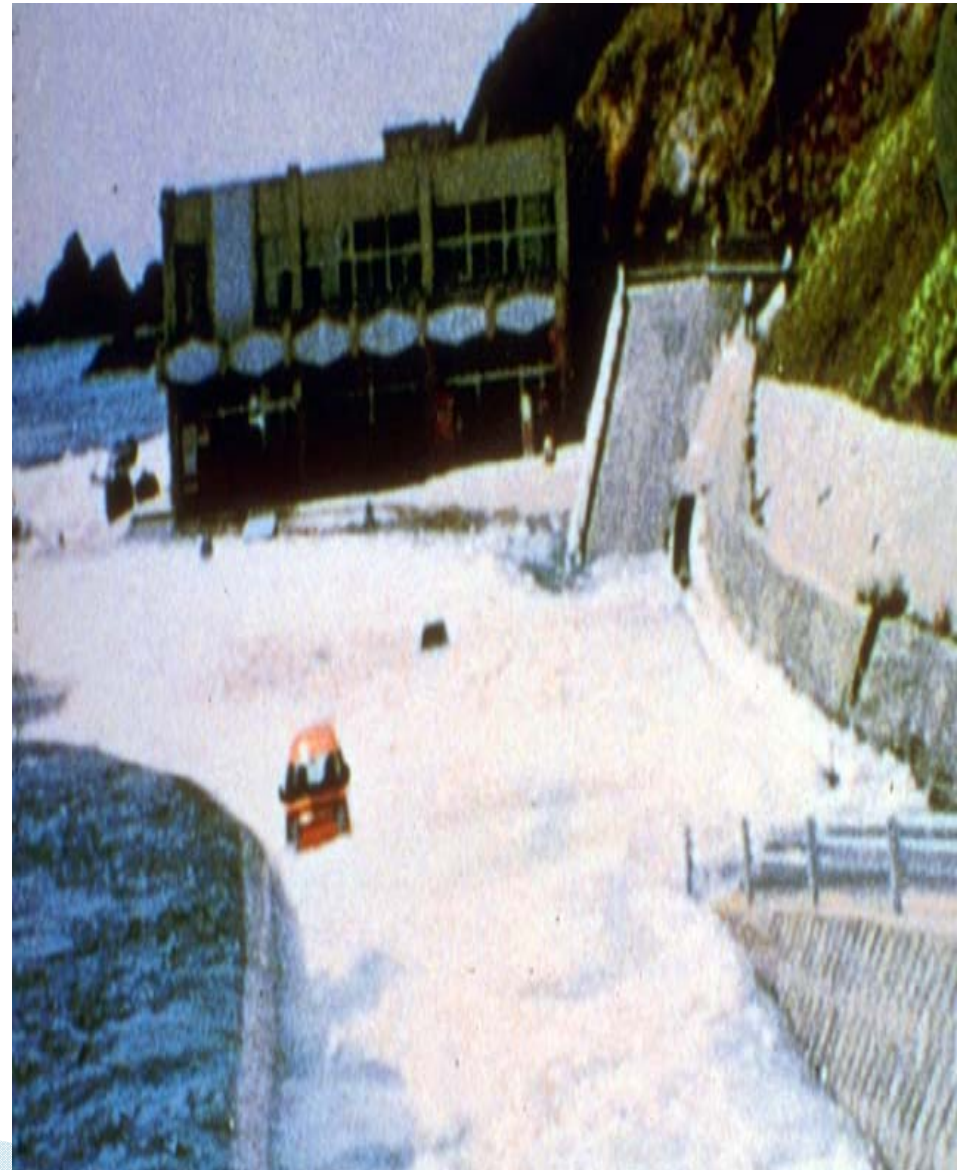
Mangrove Plant



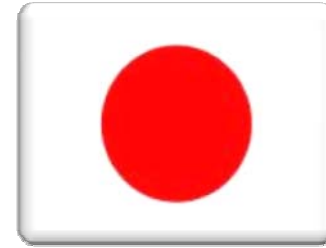
Panadus Plant

- ✓ Building of Bio-Shields with community Participation
- ✓ Planting of Mangroves and sea shore plants such as Pandanus sp. to provide a wave-break

Tsunami in Japan



Mitigation and Risk Reduction Activities in Japan

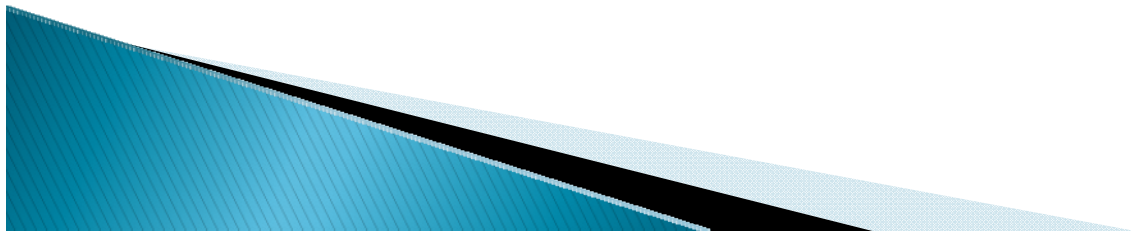


Structural Mitigation Methods in Japan

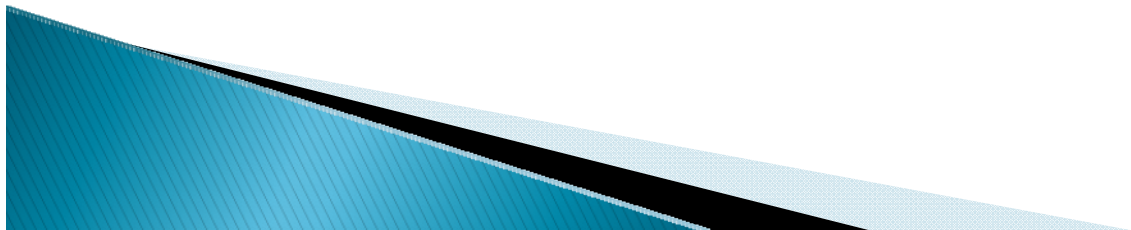
1. Tsunami Walls
2. Natural Coastal Barriers.
3. Tsunami Gates.
4. Safe Evacuation Routes.
5. Safe Evacuation Centers.
6. Properly Designed Safe Evacuation Signs.
7. Self manageable Evacuation Centers.
8. Proper Drainage System,

Non Structural Methods

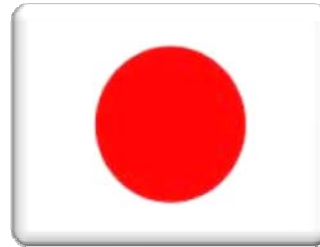
1. Advanced Early Warning Methods.
2. Better Public awareness and school education on Disasters.
3. Better Planings.



Tsunami Walls



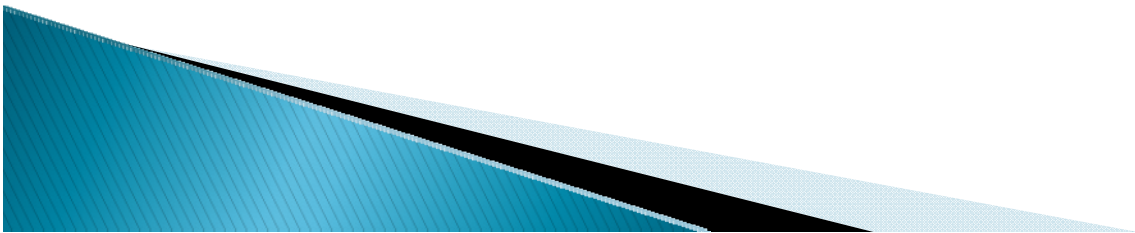
Natural Coastal Barriers.



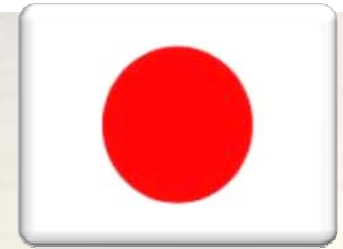
Pine trees along the Coastal area in the Japan



Tsunami Gates.

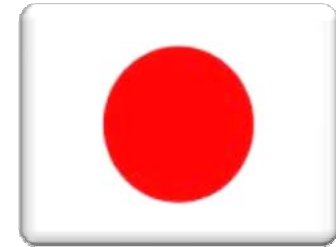


Safe Evacuation Routes.

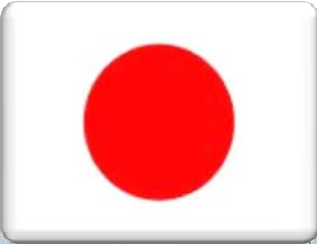


Safe Evacuation Centers

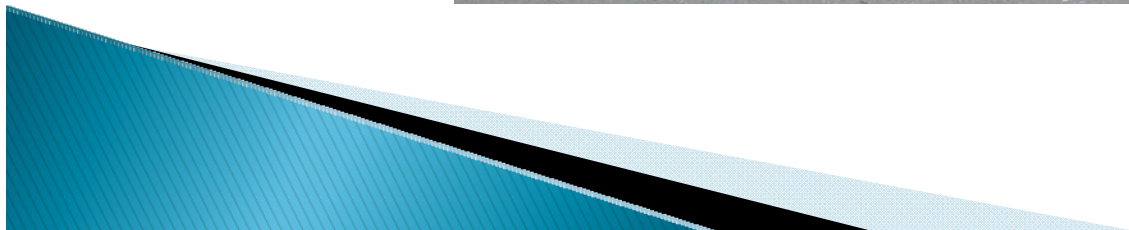
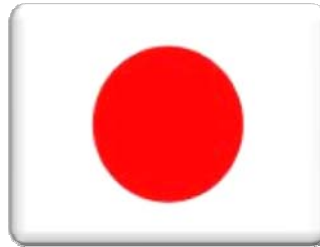
All the Emergency Items are available in the Safe evacuation centers



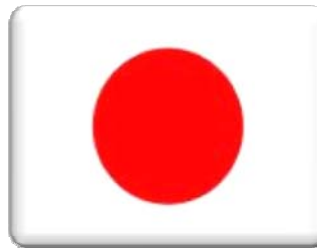
Evacuation Sign Boards located in the Inamura Village with self powered solar system



Mobile Rescue Services.



Digital Hazard Mapping

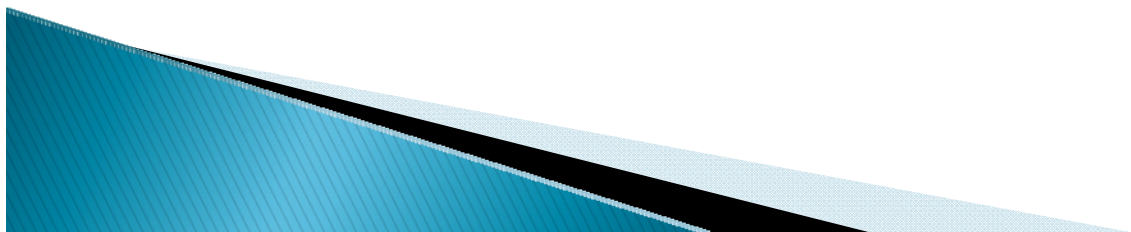


Limitations for the Tsunami Early Warning, Risk Reduction and Public Awareness

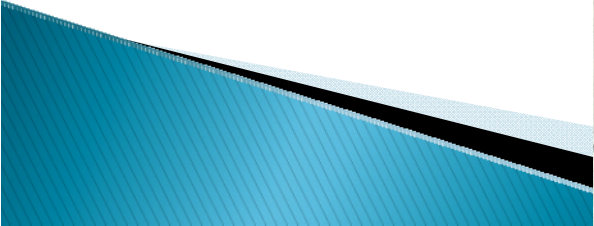
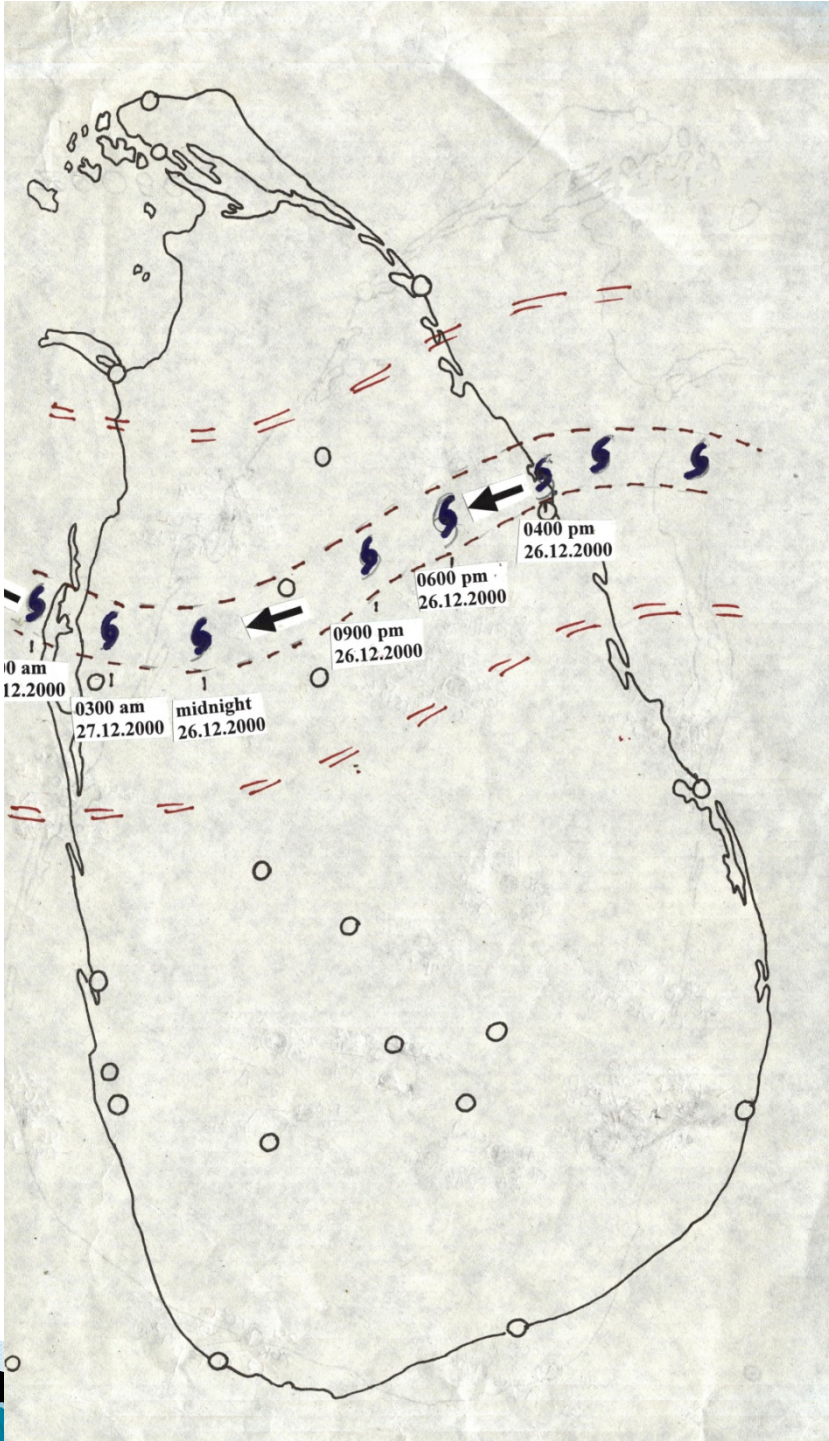


- Dependent on the Early Warning Data from other agencies
- Lack of Resources (High Tec)
- Authority for the Dissemination.
- Speed of the information from the relevant authorities.
- Lack of funds
- Encroachment of the public to the coastal areas.

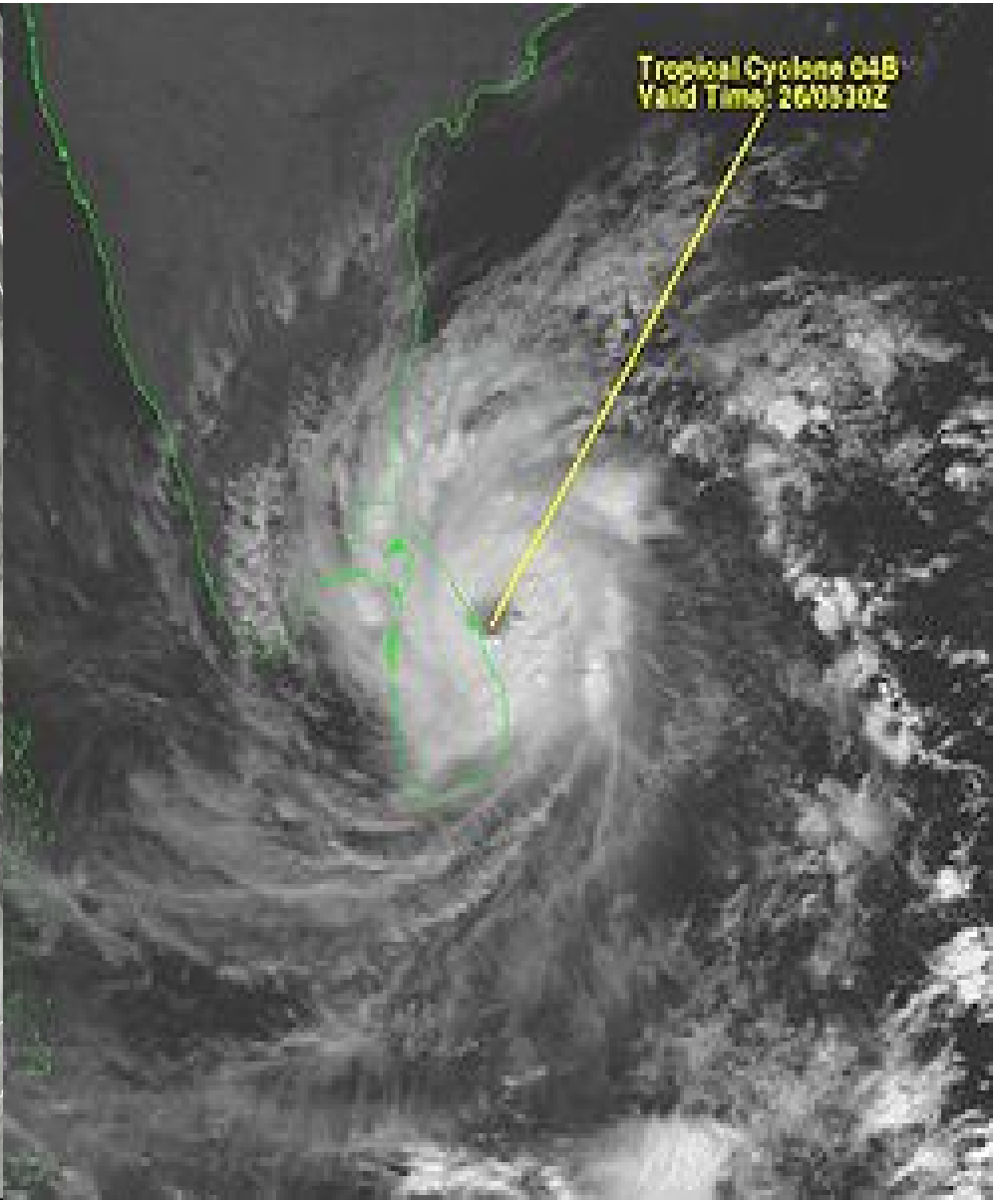
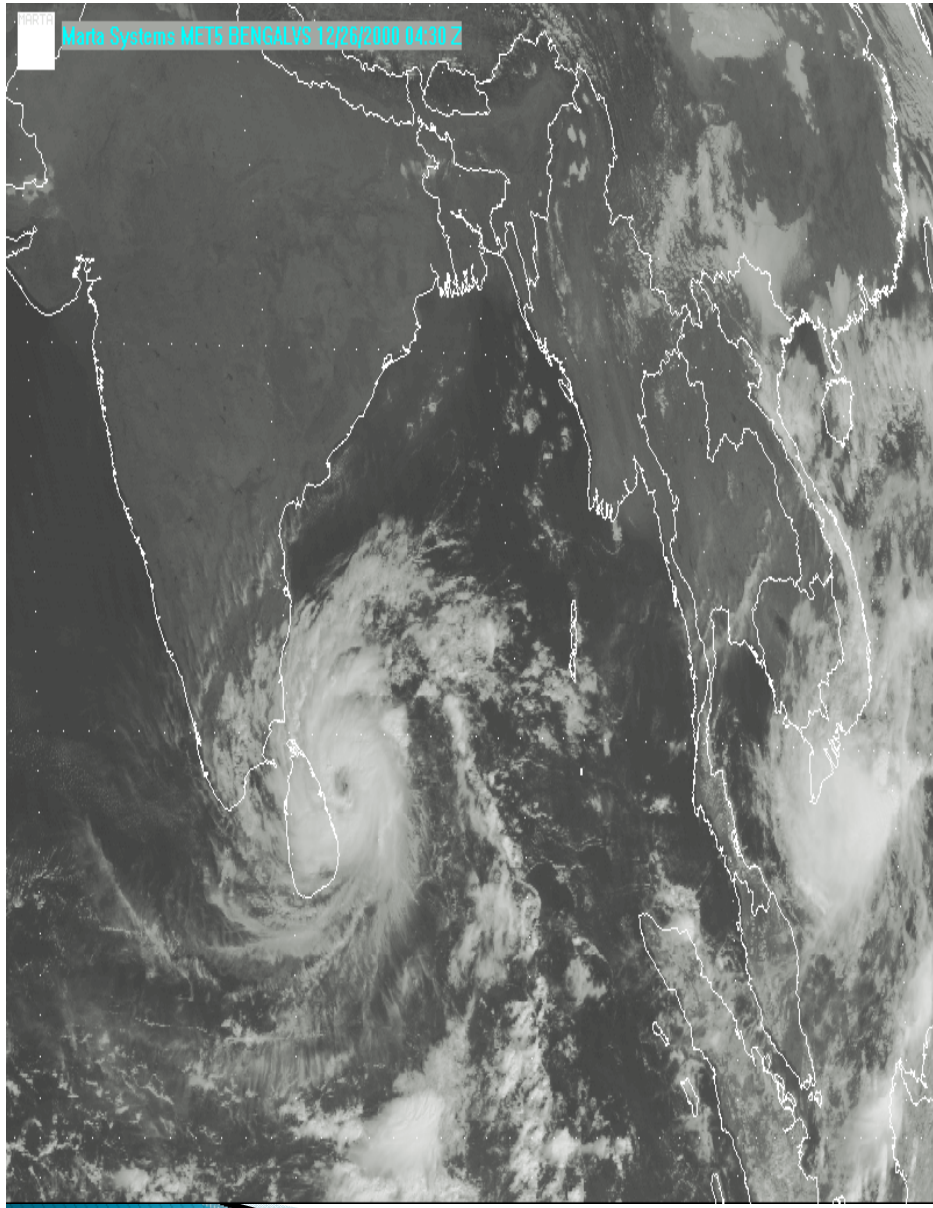
Contribution to the Sri Lankan DRR



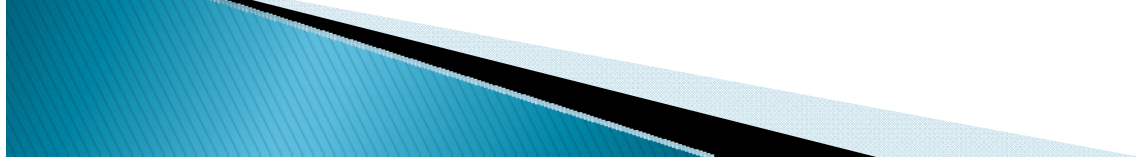
Cyclone December to March



Meta Systems METS BENGALURU 1326/2001 0430 Z

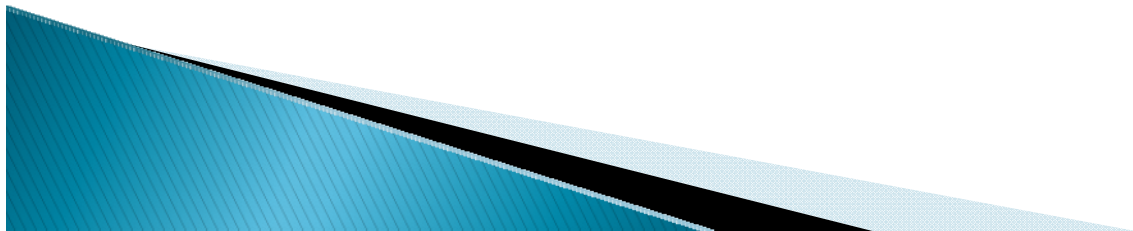


Tropical Cyclone 04B
Valid Time: 200510Z



Mitigation activities for Cyclones

- Evacuation Drills,
- New building codes
- Public Awareness including schools
- Proper Early warnings





Damage to property by elephants.

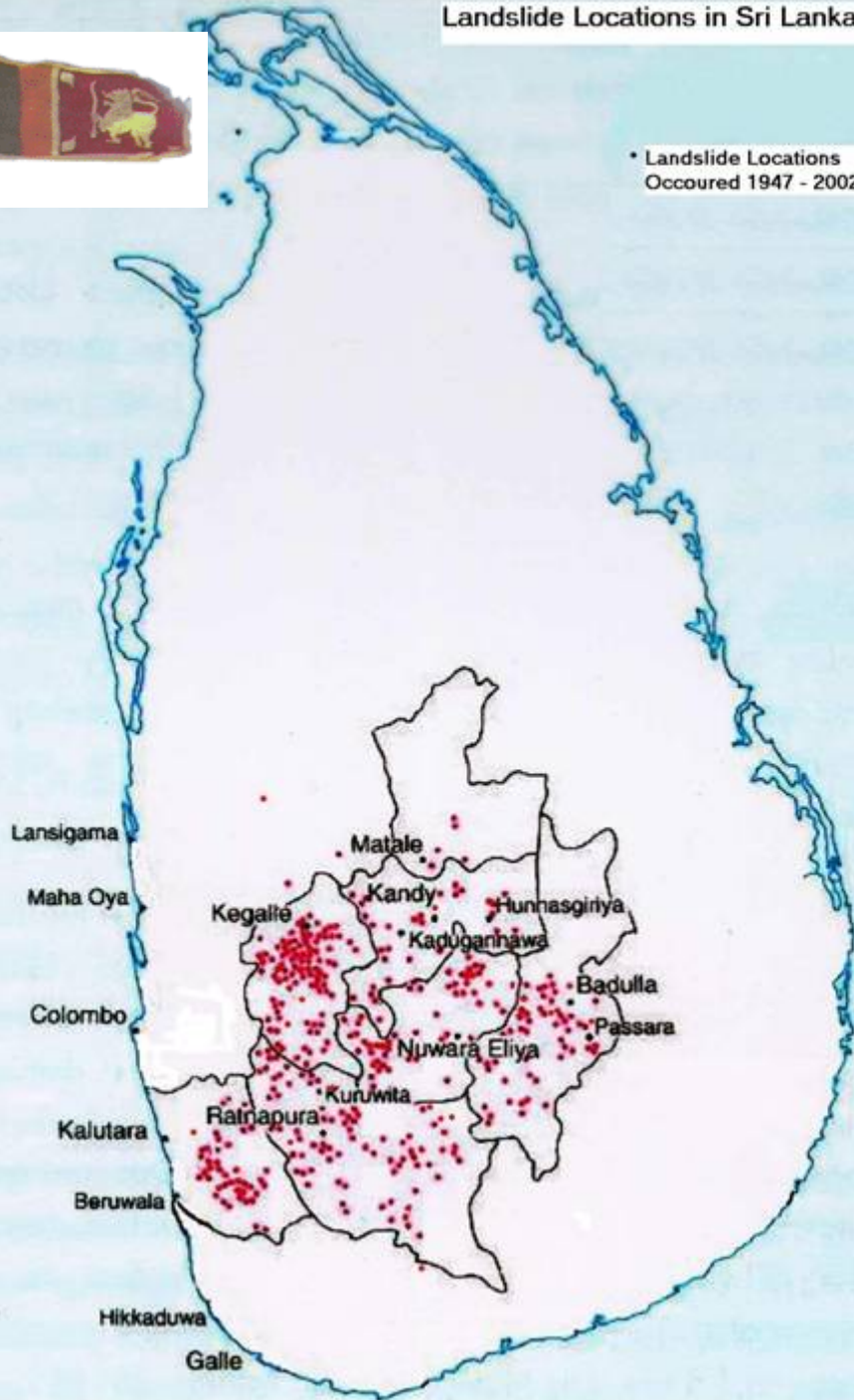
Year	Number properties
2004	532
2005	669
2006	708
2007	800+



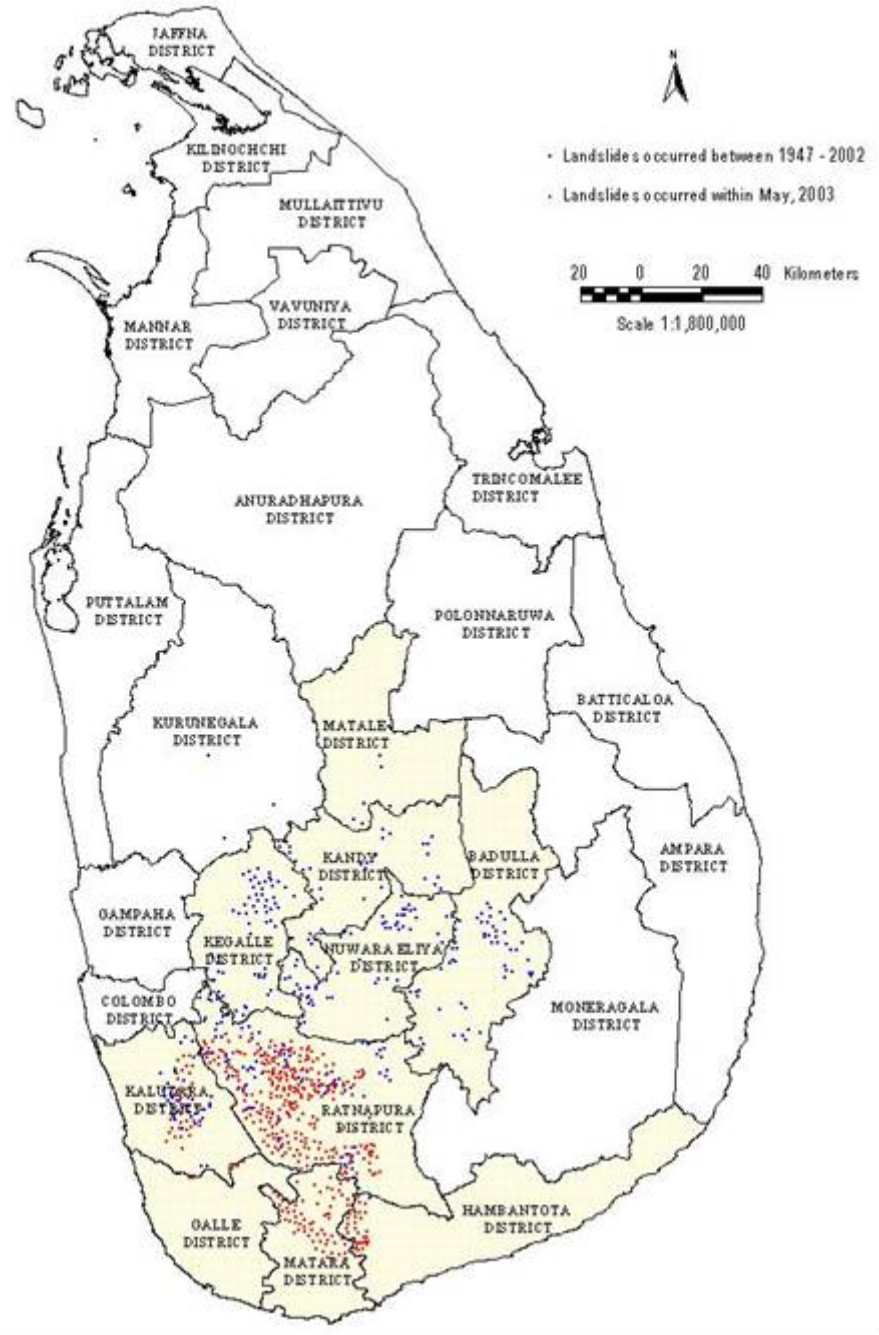
Landslide Locations in Sri Lanka



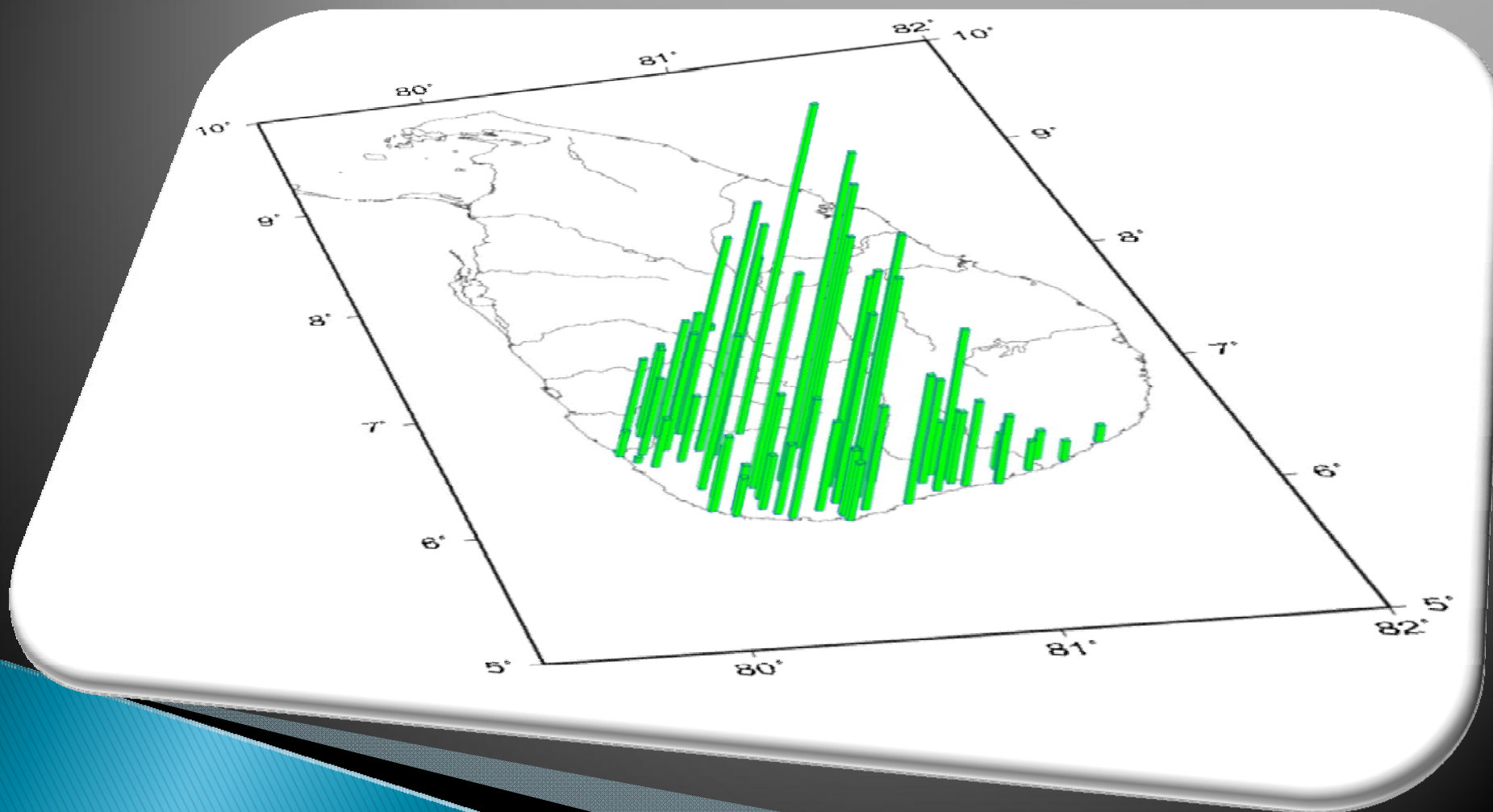
• Landslide Locations Occurred 1947 - 2002



DISTRIBUTION OF LANDSLIDES IN SRI LANKA



Observed Rainfall Value in Upper Mountain rea



Landslides



Ladupita, Kiriwanella-2007



Damaged House at Mahawewa at Walapane



Damaged house at Kirimetiya at Hewaheta

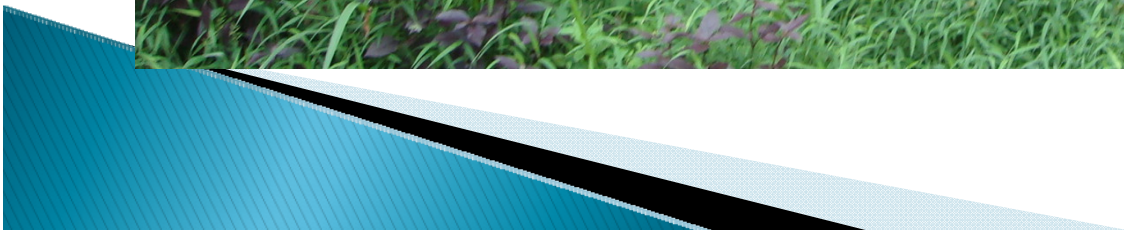


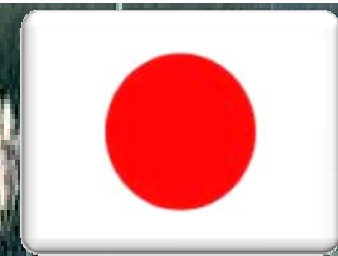
Watawela -1992/1993



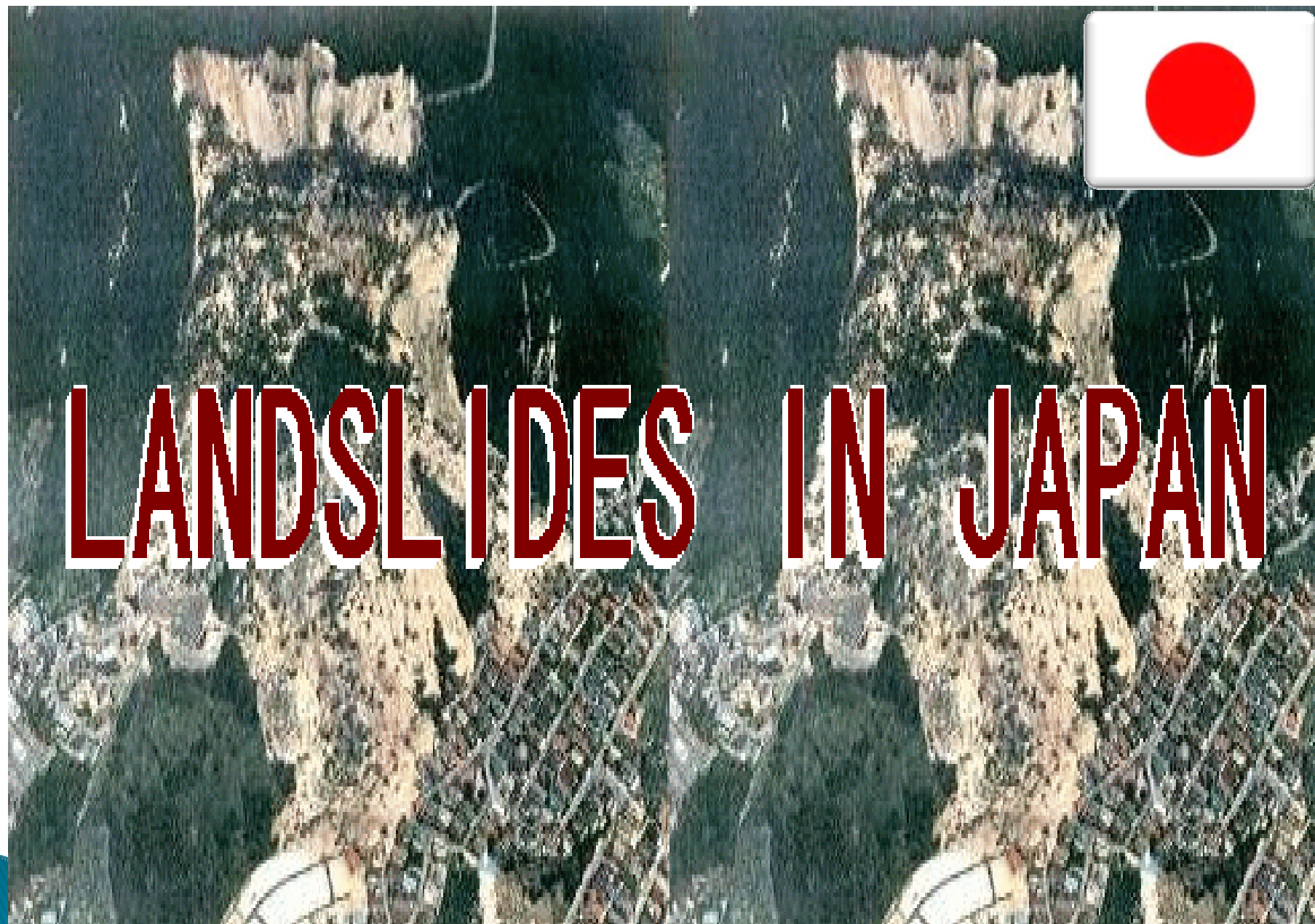
Koslanda -1997

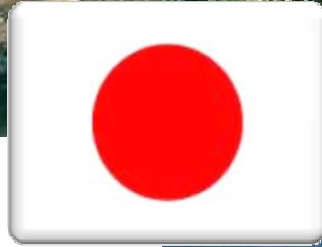
Number of land slide mitigation projects were conducted in the upper mountain area to reduce the risk





LANDSLIDES IN JAPAN





*Motochi Earth Flow, conditions
Immediately following the sliding*



Panoramic view of the Takisaka Landslide



Panoramic view of the Nurusawa Landslide

25% of Japans' land area is flat and low lying with plateaus, the Japanese people have suffered numerous landslide disasters since ancient times

Land Slide Mitigation Program In Japan



A drainage well using reinforced concrete segments



Surface drainage ditches



Ohdo Dam Landslide



Bishamon Landslide



Land Slide Mitigation Project at Nigawa area.





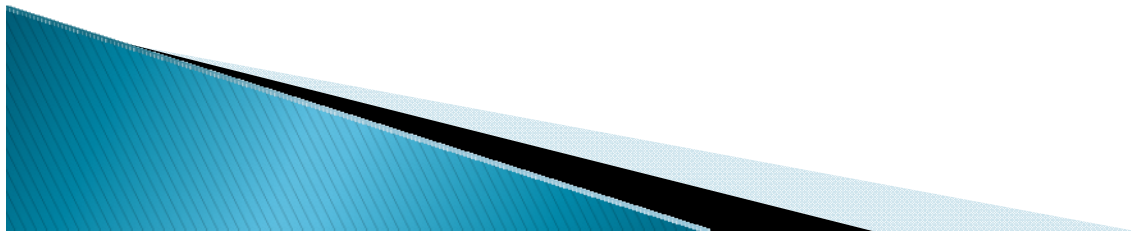
Limitations for the Landslide mitigation in Sri Lanka

1. Funds

2. Technology

3. Natural Factors

4. Encroachment of the People



BOMB EXPLOSION

MAN MADE DISASTERS







Man made cutting failure at Beruwala



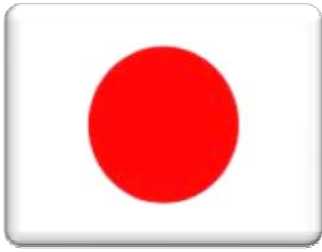
Imd, Ikao Pdwe,-2006



Imd, Ikao Pdwe,- 2006



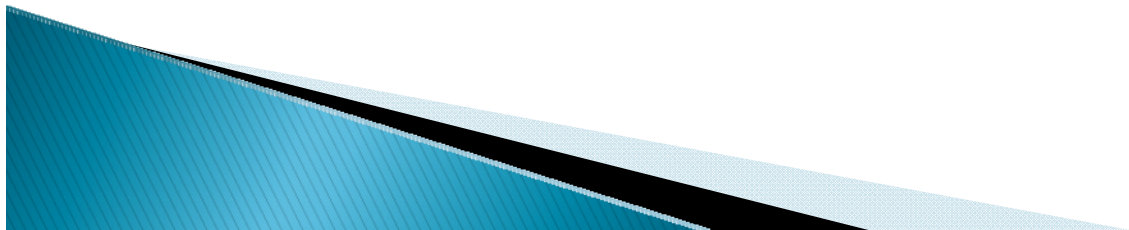
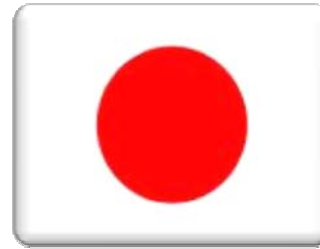
Imd, Ikao Pdwe,-2006



Nearly 150,000 people dead by the Atom bomb.



Never Want to Hear of
Such a Man made
Disaster in the world.



CROCODILE CAGES PROJECT AT MATARA

More than
3000
families are
benefitted



ESTABLISHMENT OF ELECTRIC FENCES AND LIVE FENCES



Spent more than 20 Mn
Rupees



- ✘ Electric fences are traditionally used as a barrier for Elephants.



How We reach to the People through

Early Warning Division

To Reduce the Risk?



Multi-Hazards Warning Dissemination System

Global Disaster Alert and Coordination System (GDACS) & USGS

SMS/e-mail

PTWS DOM NBRO NARA DOI GSMB CCD

Atomic Energy Authority

Regional & International Organizations

Receiving Early Warnings

Government Agencies, Critical Agencies & Stakeholders
Police
Media & General Public
Military
UN System, INGOs, NGOs

Dissemination of Warning

Multi-Hazards Early Warning Dissemination Unit of the DMC

Outputs

- Radio Comm
- SLT/ Dialog, SMS
- Fax
- Internet
- Satellite com
- Cell Broad.
- Police Com
- Military Com
- Warning Towers
- DEWNS
- Radio / TV

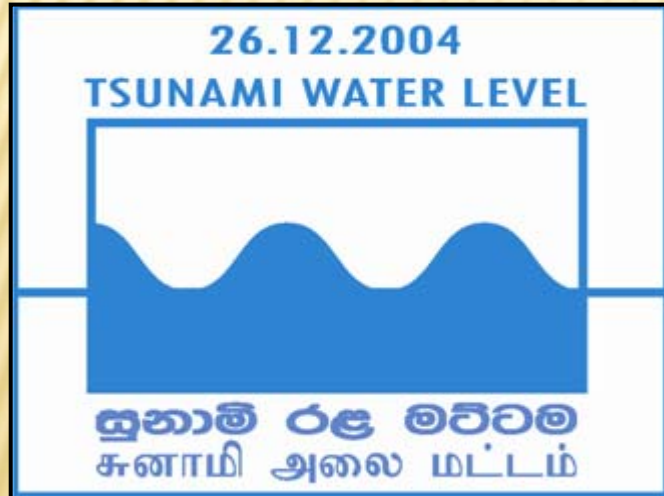
24/7 Emergency Operation Rooms

District Disaster Management Committee (DS OFFICE)
Divisional Disaster Management Committee (DIV SEC)

Village level DM Committees

Provincial Councils
District Secretariats
Divisional Secretariats
Local Authorities
Police Stations
Hospitals
Government Dpt.
NGOs, CBOs

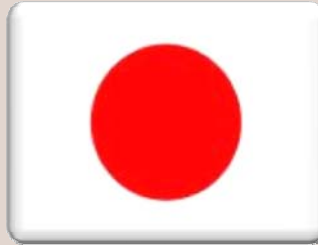
- Speaker Sys.
- Bells / Sirens
- Messengers
- Riders / Cyclers



Erection of warning signs





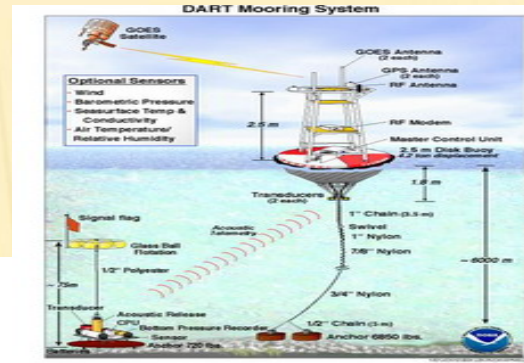


**How We reach to
the People through**

**Early Warning Division In JMA
To Reduce the Risk?**

Earth Quake Early Warning System In Japan

If The quake in the sea



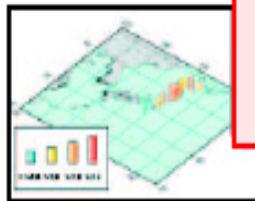
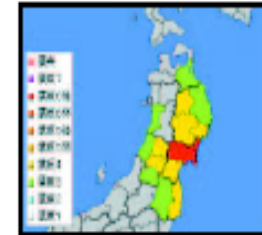
Tsunami Warning

Seismic Intensity Information



Tsunami Information
(Estimated tsunami heights and arrival times)

Earthquake Information
(Location and magnitude)



Tsunami Information
(Observed tsunami heights and arrival times)

Earthquake and Seismic Intensity Information
(Update)



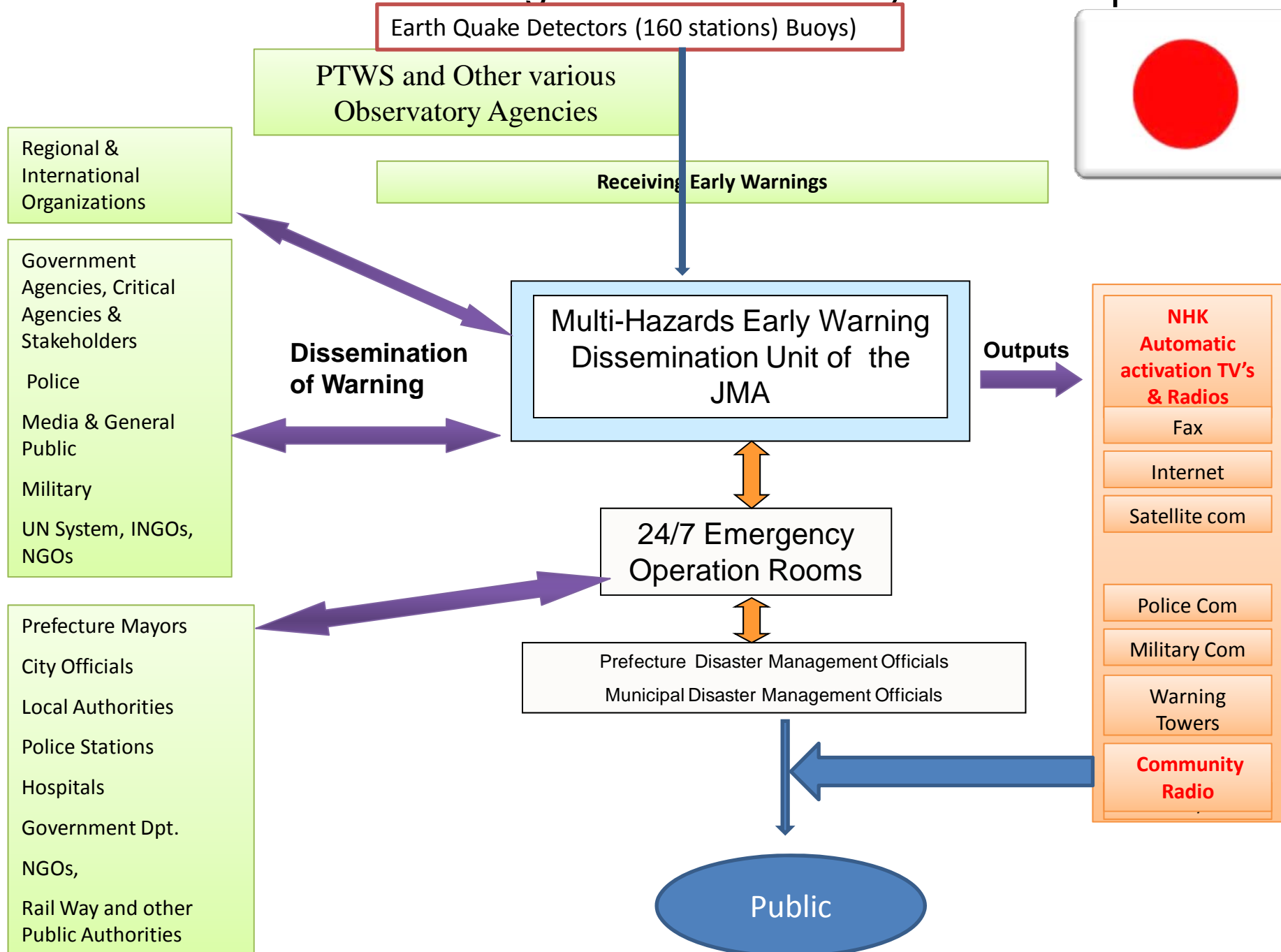
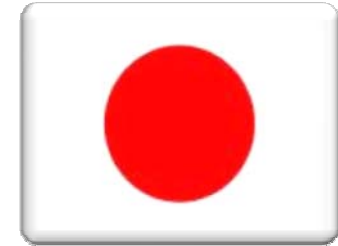
2min.

3min.

5min.



Multi-Hazards Warning Dissemination System in Japan



Inamura Nohi village









Emergency operation center

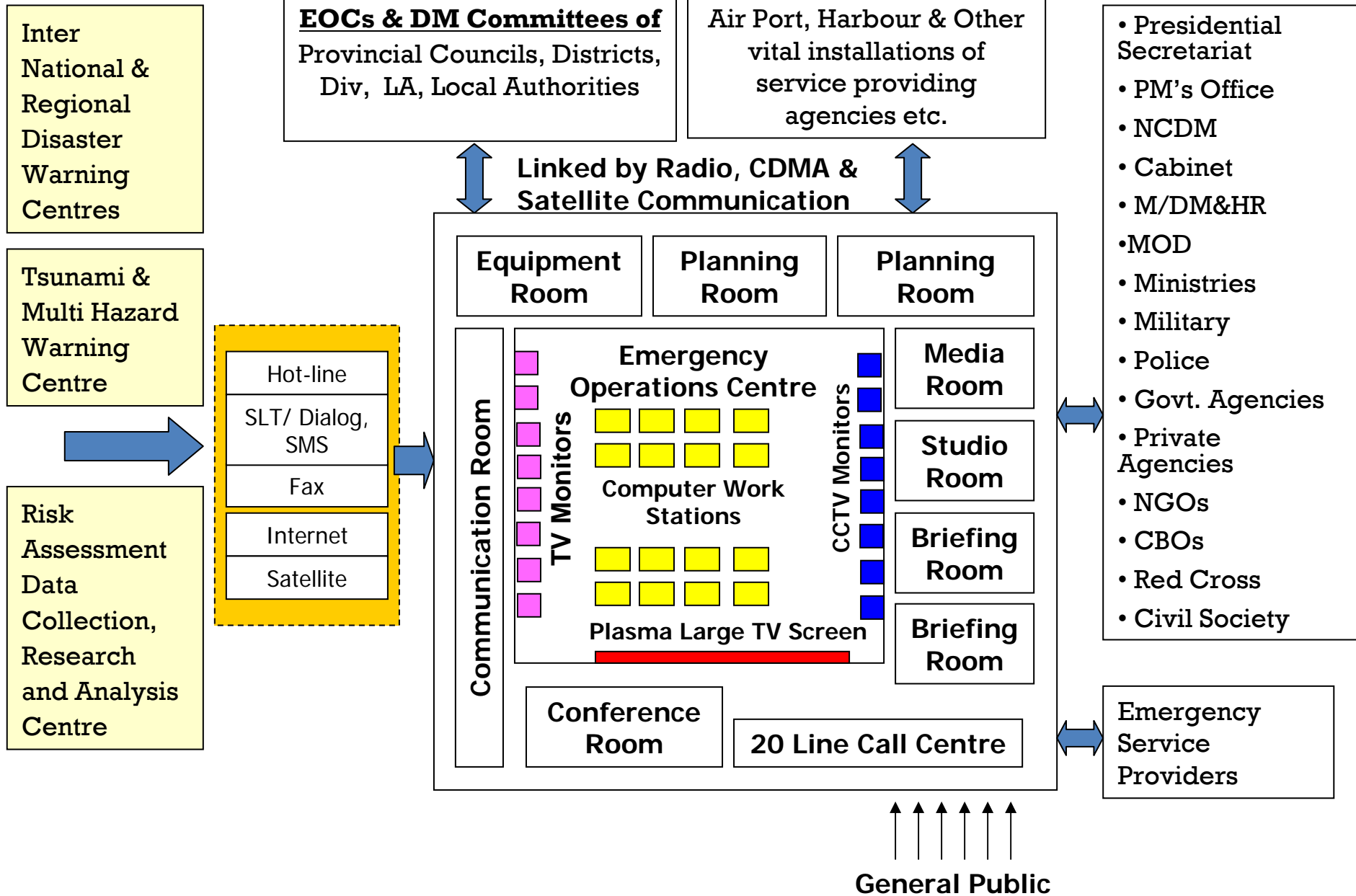


24 x 7 National Emergency Operations Centre



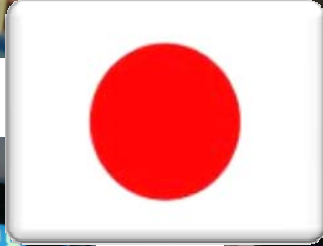
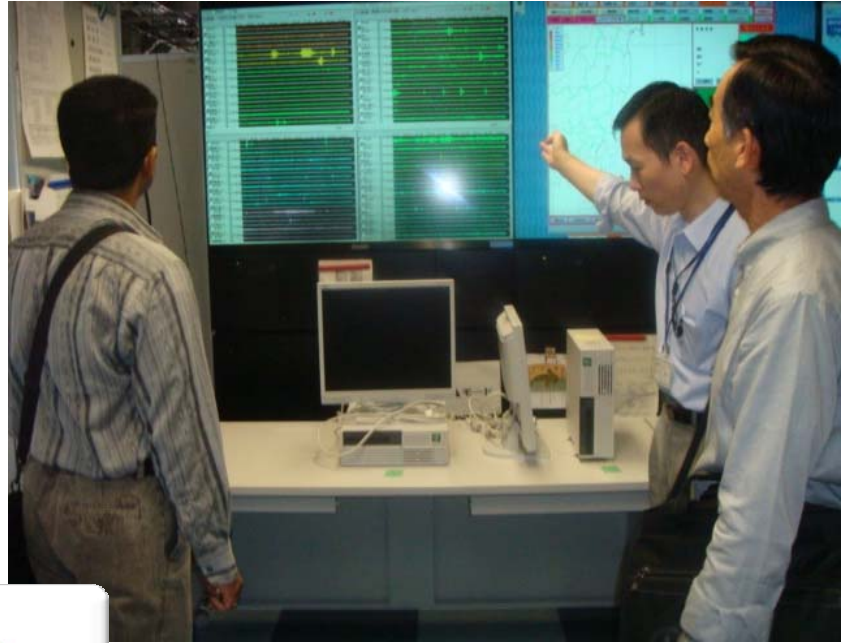


24 x 7 National Emergency Operations Centre



Emergency Operation Center In JMA









What we are doing
through the Training
and Public
Awareness Division.

Knowledge and Awareness Building in Communities Risk Reduction



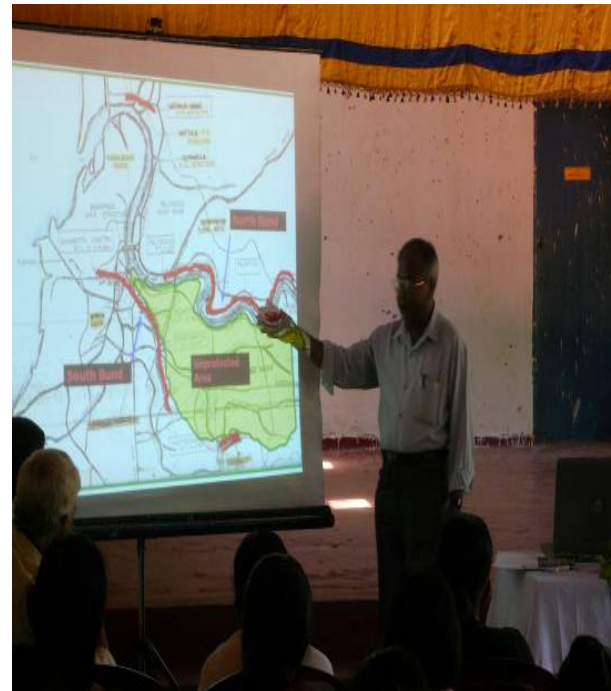


Participatory Work with Communities

Workshops and Lectures

On Mechanism of Disasters and Disaster Management

Purpose: To understand current situation of community disaster risk management system and disaster response



Field Survey (Town Watching)

Discussion on evacuation in case of emergency
Confirmation/Reconsideration of proposed evacuation route



Develop a Community-based Hazard Map (draft)

To Visualize the observations and findings through the discussion and field survey.



Hazard Mapping



- ✓ Participatory Hazard Mapping carried out with communities.
- ✓ Communities are selected for hazard mapping.
- ✓ This ensures cohesive ownership of the activity.
- ✓ It also allows identification of informal leadership to ensure sustainability of the intervention.
- ✓ Disaster prone areas are identified.
- ✓ Routes, Safe areas, RVs are marked.

Discussion on Current Problem & Action Plan



To discuss

- what are the problems,
- who is responsible to solve them,
- what actions are needed.



Participatory Hazard Mapping in Vulnerable Communities





Community Evacuation Drills



Mock Drills to ensure response capacities



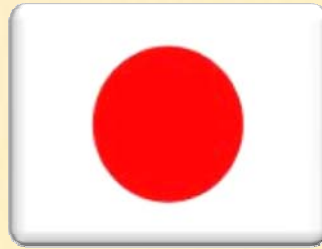
Community Response Capacity

Community response capacity enhance through the training of village level volunteers for the following;

- ✓ First Aid
- ✓ Life Saving
- ✓ Swimming
- ✓ Boat handling
- ✓ Leadership (Outward Bound Training)
- ✓ Search & Rescue
- ✓ Camp Management







Public Awareness for the Disasters in Japan

Role of Education System has been Modified to prepare the Community for all kinds of Disasters in Japan.

1. Elementary Education
2. High school Education
3. University Education
4. Community Education
5. International Education



Education Materials for the Disaster Education In Japan.

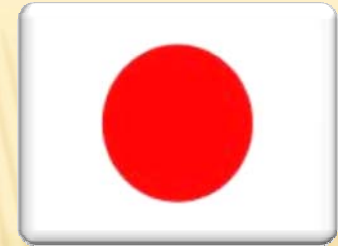
1. Awareness programs – Most of the Volunteers are sharing the knowledge with the public.
2. Drills – Attended the Tsunami Drill in Awaji Island
3. Training Centers and Museums—To train the public with real experience and the real Knowledge.
4. Town Watching- Most of the places of their cities are monitored by the residents to contribute the comments to the local governments and relevant authorities.
5. Education System- Very Important to give he past experience to the younger generations.
6. International Trainings- ADRC VR program is a very Good and Important example to the world



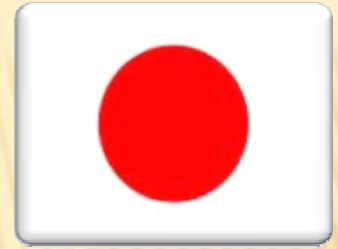
Public Awareness



University Students Sharing the Knowledge with the Public

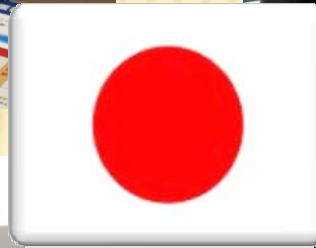


Drills – Awaji Island



Every Cities, these kind of Drills are conducted to share the real experience with the community and test the system of Disaster Relief, Rescue, Evacuation and etc.....

Training Centers and Museums—To train the public with real experience and the real Knowledge.



Findings...

- Scientific Back ground of the Storm serge and Tsunami
- Practical Experience of the disasters

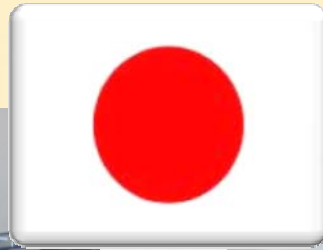


Post Traumatic stress disorder

In Japan

After all kinds of the Disaster PTSD treatments are given by the volunteers and other related organizations.





Real Experience was gained on Volcanology- Unzen Mountain



Town Watching



Elementary School Students and their parents are actively participating for Disaster Drills.



Fire Training in Japan in the schools





School Education On the Disaster Management- Interview for the Disaster Knowledge of the Public.



International Trainings to share the knowledge.





Preparedness and the Planning Division.



Preparedness & Response Plans

- ✓ National Level Plans
- ✓ Provincial Level Plans
- ✓ District Level Plans
- ✓ Divisional Level Plans
- ✓ Gramaniladhari Level Plans

Preparation of SOPs at National, District,
Divisional and Community Levels



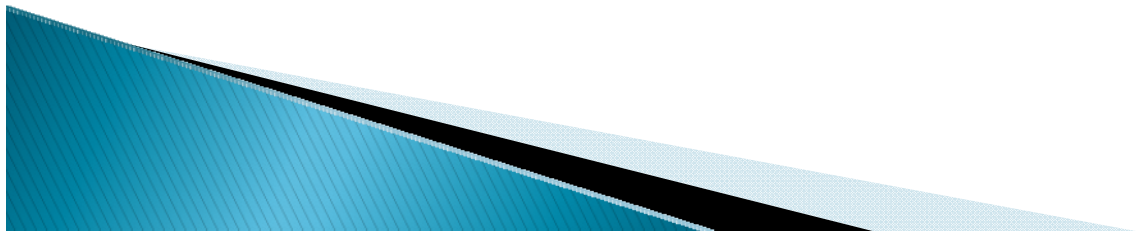


Disaster Management Plans

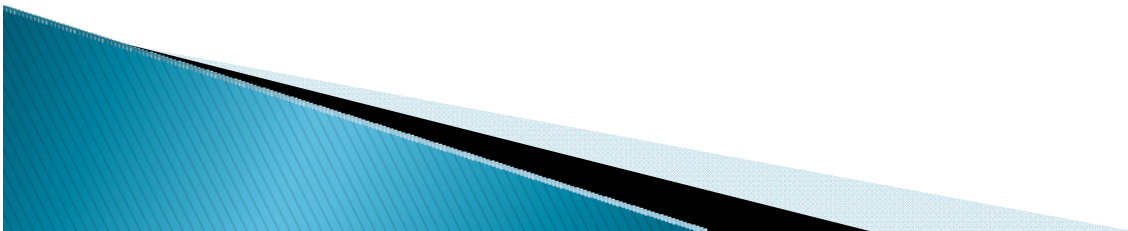
- ✓ School Preparedness Plans.
- ✓ Institutional Preparedness Plans
- ✓ Hospital Preparedness Plans for mass casualty transfer.



Preparedness for the Disasters in Japan



- ▶ Japan is one of the country has shown a most Advanced preparedness for the Disasters.
- ▶ DM Plans(National/Prefecture/City), Laws(Acts), Emergency First Aid, Emergency Response teams, Relief are already been established in proper way.
- ▶ Most of the community is trained for the disaster management activities. It will be the most important factor to organize at a disaster.



Common Places are equipped with fire control



Preparedness at a Evacuation Centre



Emergency Response Teams



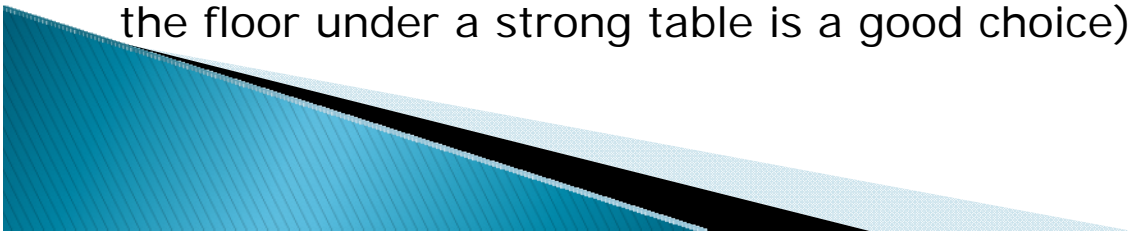
Emergency First Aid Is available in Public places.



Essential Supplies (Store enough for three-five days)

- ▶Water (four liters/one gallon per person per day. Change water every three to five months)
- ▶Food (canned or pre-cooked, requiring no heat or water. Consider special dietary needs, infants, the elderly, pets)
- ▶Flashlight with spare batteries and bulbs
- ▶Radio (battery operated with spare batteries)
- ▶Large plastic trash bags (for trash, waste, water protection, ground cloth, temporary blanket)
- ▶Hand soap and/or disinfecting hand cleaner gel that does not require water
- ▶ Feminine hygiene supplies, infant supplies, toilet paper
- ▶Essential medications as required; glasses if you normally wear contacts
- ▶Paper plates, cups, plastic utensils, cooking foil and plastic wrap (wrapped around plates so that they were re-usable) and paper towels
- ▶First Aid kit with instructions
- ▶ Yen in small bills (ATMs may not work after a disaster), with coins and phone cards for public phones.

Place emergency supplies and your telephone in places where they are less likely to be knocked over or buried by falling objects (on the floor under a strong table is a good choice).



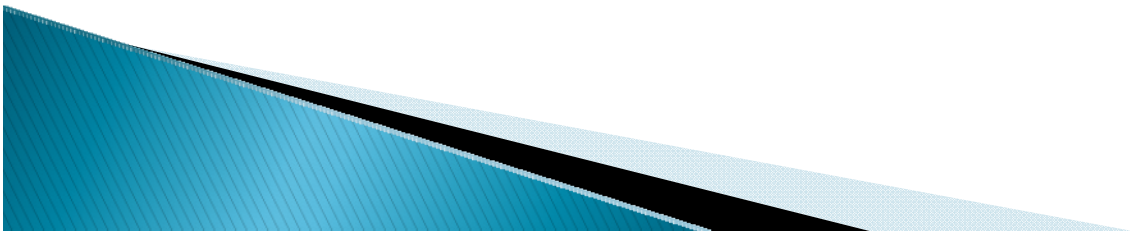
Conclusion of the VR Training

What can be learned more;

- **How to live with Disasters safely.**
- **Even a one life is Important than Millions of money.**
- **Do the Disaster Reduction activities as they needed.**
- **Prevention is better than Cure.**
- **Mutual Help.**
- **Public Awareness.**
- **Education and Disaster Management**
- **Volunteer Support to the society.**
- **Nation's Attitudes for Disaster Management.**
- **Share the knowledge to other countries.**

Japan, Japanese People and ADRC

- Attraction of the country
- Hospitality for the other nations
- Kindness for the people
- Caring of the people
- Corporation of the younger generation
- Gather international people together
- Helpful Nation for the world
- Protect the environment



One of Most Beautiful Country



Osaka, Japan
wesley wong
photography



Kyoto, Japan
wesley wong
photography



Kyoto, Japan
wesley wong
photography



Hospitality for the other nations



Kindness of the People



Caring



Caring



Corporation of the younger generation



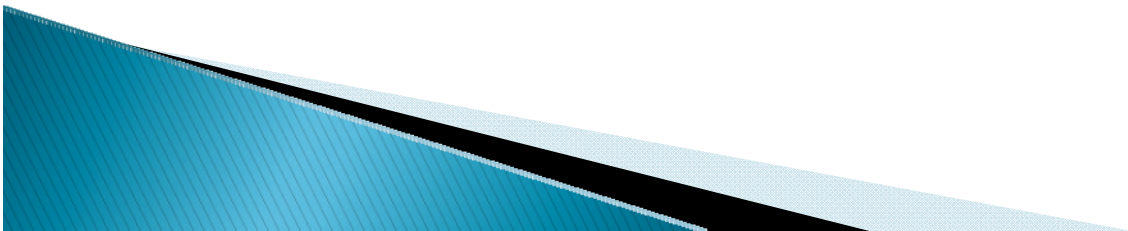


Gather international people
together



Suggestions for the Visiting Researcher Course in ADRC

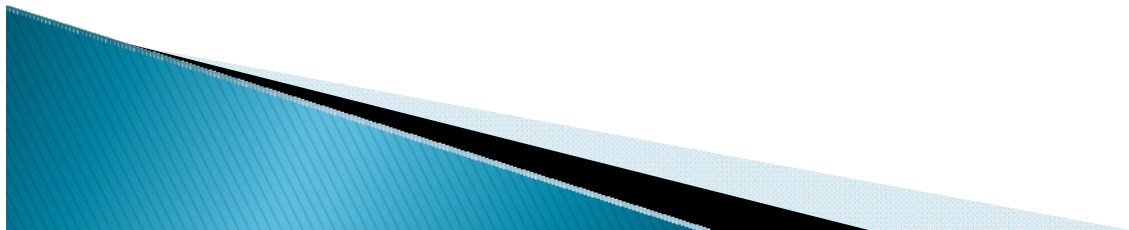
1. Increase the number of ADRC researchers to get more benefit on this valuable course.
2. Keep a good relationship with ADRC visiting researchers over the world.
3. Connect all the visiting researchers together and create a VR network.
4. Give Pressure to all the VRs to apply and contribute this knowledge to their countries.
5. Circulate these reports all around the world to share the knowledge.



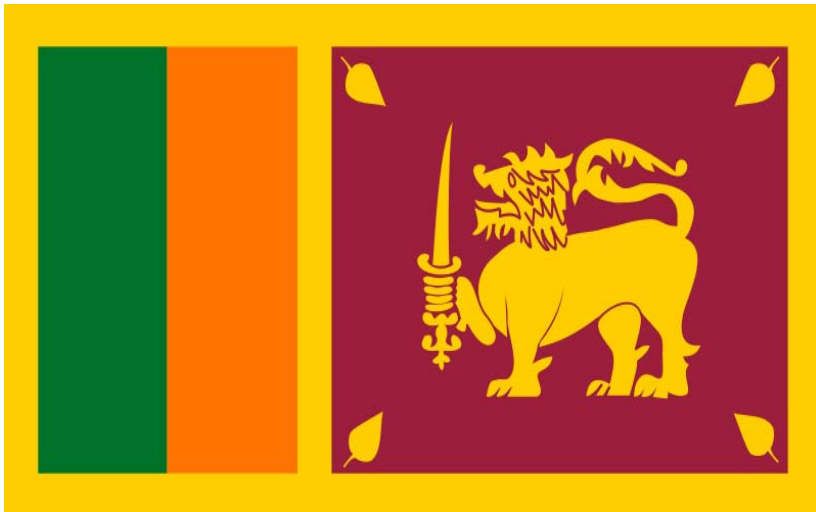
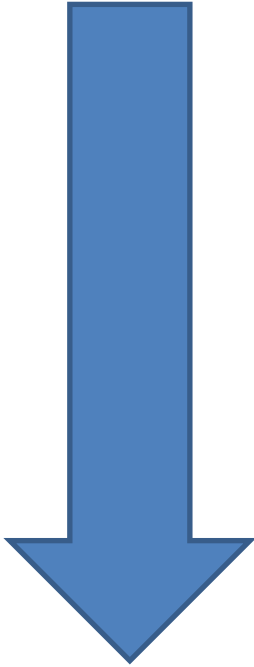


I have some
promise for
the ADRC

- I will be a Life time member in ADRC
- I will contribute this knowledge to my disaster management system in my country
- **You are welcome to Sri Lanka any time**



On Behalf of Sri Lanka and



**Thanks to
ADRC**



Thanks to Japan



**Thanks to All
of the ADRC
Staff**

Thanks to

- **Mishra –Nepal**
- **Jo – Philippine**
- **Malik - Pakistan**

Good Bye to the
Helpful Nation for the world



Thank
You

