



# Meeriyabedda Tragedy: Lessons for Future

PHCS Rathnasiri  
*Human Settlement Planning and Training Division, NBRO*

EE Wijegunaratne  
*Human Settlement Planning and Training Division, NBRO*

**ABSTRACT** : Meeriyabedda landslide that activated on 29<sup>th</sup> October 2014 destroyed 37 lives and 75 buildings located in the settlement warning stakeholders whose responsibility is vested in the Disaster Management of the country. More systematic approach of disaster management in Sri Lanka has been developed since 2005 right after the Great Indian Oceanic Tsunami that struck most of the countries located along South-East coastal belt of Asian continent in December 2004 including Sri Lanka. In this, institutional framework was established for Disaster Management sharing responsibility from apex level of the country making His Excellency the President of the Country as the chairman for the National Council for Disaster Management (NCDM). In this context, Meeriyabedda tragedy emphasis the need for re-examine Disaster Management approach of the country with reference to principles of disaster management under key phases of disaster management especially pre disaster risk reduction approaches. This paper discusses lessons for future Disaster Risk Reduction (DRR) approaches based on the principles of disaster management with special reference to the case of Meeriyabedda landslide.

**Keywords**; *Systematic approach of disaster management, Meeriyabedda tragedy, principles of disaster management, lessons for future*

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## 1 BACKGROUND

Recent landslide tragedy that took place on 29<sup>th</sup> October 2014 caused buried entire Meeriyabedda settlement losing 37 lives and 74 building units including 68 estate housing units. Although, occurrences of natural hazards are uncontrollable and unpredictable by nature, Disaster Risk Management focuses to reduce the impacts of such hazards following a systematic approach (UNISDR, 2009).

Systematic approach for Disaster Risk Management (DRM) in Sri Lanka was strengthening right after the Great Indian Ocean Tsunami that struck coastal areas of Sri Lanka and most of other South-Asian coastal countries on 26<sup>th</sup> December 2004 causing massive destruction. Subsequently, enactment of the Disaster Management Act No.13 of 2005 and establishment of the National Council for Disaster Management (NCDM) chaired by H.E the President of the country consisting with Hon. Prime Minister (Vice Chairman) and all the line Ministries gave due recognition to disaster management in Sri Lanka at apex level ([www.disastermin.gov.lk](http://www.disastermin.gov.lk)). Accordingly, institutions such as Disaster Management Centre (DMC), National Building Research Organization (NBRO), National Disaster Relief Service Centre (NDRSC) and Department of Meteorology (DoM) operates under the purview of the Ministry of

Disaster Management, are directly involved in the Disaster Management (DM) in Sri Lanka.

But, with the disaster events recently occurred with intensive rainfall emphasis the need to revisit disaster risk management approaches with reference to basic principles. In this paper, principles in disaster management are discussed especially its application in grass root level with special reference to the case at Meeriyabedda landslide tragedy.

## 2 PRINCIPLES IN DISASTER MANAGEMENT

This section discusses the findings of literature survey that was conducted to document theoretically established norms and principles in disaster management. Accordingly, this section presents basic definitions, key components and internationally accepted principles in Disaster Risk Management.

UNISDR, 2009 defines a disaster as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources”. Also, ADB, 2008 defines it as “an event, natural or man-



made, sudden or progressive, which impacts with such severity that the affected community has to respond by taking exceptional measures". Also, UNISDR, 2009 defines Disaster Risk as "the potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period" and Disaster Risk Management as "the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster".

As well as, ADB, 2008 described Disaster Management as "An applied science which seeks, by the systematic observation and analysis of disasters, to improve measures relating to prevention, mitigation, preparedness, emergency response and recovery".

Accordingly, activities under the components of prevention, mitigation and preparedness are to be implemented as pre-disaster management phase. Also, activities under the components of recovery and developments to be implemented as post-disaster management phase while activities under the component of response to be implemented under the phase of during disaster.

As elaborated by the DMC (<http://www.dmc.gov.lk/>), key activities comes under the major components of disaster management are described as below;

*Preparedness:* During the Preparedness phase, governments, organizations, and individuals develop plans to save lives, minimize disaster damage, and enhance disaster response operations. Preparedness measures include preparedness plans; emergency exercises/training; warning systems; emergency communications systems; evacuations plans and training; resource inventories; emergency personnel/contact lists; mutual aid agreements; and public information/education. *Response:* Response activities follow a disaster. These activities provide emergency assistance for casualties, reduce the probability of secondary damage, and speed recovery operations. Response measures include activating public warning; notifying of public authorities; mobilizing emergency personnel/equipment; emergency medical assistance; manning emergency operations centers; declaring disasters and evacuating; mobilizing security forces; search and rescue; and emergency suspension of laws. *Recovery:* Recovery activities continue until all systems return to normal or better.

Recovery measures, both short and long term, include returning vital life-support systems to minimum operating standards; damage insurance/loans and grants; temporary housing; long-term medical care; disaster unemployment insurance; public information; health and safety education; reconstruction; counseling programs; and economic impact studies. Information resources and services include data collection related to rebuilding, claims processing, and documentation of lessons learned. *Mitigation:* Mitigation activities actually eliminate or reduce the probability of occurrence of a disaster, or reduce the effects of unavoidable disasters. Mitigation measures include building codes; vulnerability analyses updates; tax incentives and disincentives; zoning and land use management; building use regulations and safety codes; allocations and interstate sharing of resources; preventive health care; and public education. Information resources and services important in mitigation activities include GIS-based risk assessment; claims history; facility/resource identification; land use/zoning; and building code information. Use of modeling/prediction tools for trend and risk analysis is also important.

United Nations International Strategy for Disaster Reduction (UNISDR) is the prime International Agency work on DRR in their member countries where they have being working under the mandate "to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organizations and activities in socio-economic and humanitarian fields" (<http://www.unisdr.org>). With the support of the UNISDR upon the request of UN General Assembly, different policy frameworks for Disaster Reduction have been formulated and agreed at the World Conferences on Disaster Reduction. Accordingly, one of the important and immediate past policy framework was the Hyogo Framework for Action (2005-2015) which was adopted at the World Conference on Disaster Reduction that was held from 18 to 22 January 2005 in Kobe, Hyogo, Japan. Policy theme of this framework was 'Building the Resilience of Nations and Communities to Disasters' and five priorities for action was defined by the Hyogo Framework as describes below;

Priority 1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation. Priority 2. Identify, assess and monitor disaster risks and enhance early warning. Priority 3. Use knowledge, innovation and education to build a culture of safety



and resilience at all levels. Priority 4. Reduce the underlying risk factors. Priority 5. Strengthen disaster preparedness for effective response at all levels.

With the completion of 10 year period of implementing Disaster Reduction activities under the Hyogo Framework by 2015, Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted at the World Conference in Sendai, Japan as the prime policy document where all the member countries are agreed to work for DRR in their countries accordingly. The Sendai Framework for Disaster Risk Reduction (2015-2030) highlight four priority areas for actions as describe below (<http://www.unisdr.org>);

Priority 1. Understanding disaster risk, Priority 2. Strengthening disaster risk governance to manage disaster risk, Priority 3. Investing in disaster risk

reduction for resilience, Priority 4. Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

According to two policy frames, it is vital to focus attention and get necessary actions on; understanding disaster risk, enhance early warning, reduce disaster risk investing on risk reduction and better preparedness, in both national and local context trough strong institutional set up.

Under the principles in Disaster Management, it should be considered different models that have been introduced to ensure effective Disaster Risk Reduction. One of such widely accepted model is the ten essentials for a disaster resilient cities introduced by UNISDR in 2008. The ten essentials introduced are described in the table 01 given below.

Table 01: Ten essentials for a disaster resilient city, UNISDR, 2008

No.	Essentials	Description
01	Institutional and Administrative Framework	Put in place Organisation and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction preparedness.
02	Financing	Assign a budget for disaster risk reduction and provide incentives for homeowners, low income families, communities, businesses and the public sector to invest in reducing the risks they face.
03	Risk Assessment	Maintain up to date data on hazards and vulnerabilities. Prepare risk assessments and use these as the basis for urban development plans and decisions, ensure that this information and the plans for your city’s resilience are readily available to the public and fully discussed with them.
04	Infrastructure	Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change.
05	Safety of Critical Element; School & Hospitals	Assess the safety of all schools and health facilities and upgrade these as necessary.
06	Planning	Apply and enforce realistic, risk compliant building regulations and land use planning principles. Identify safe land for low income citizens and upgrade informal settlements, wherever feasible.
07	Training & Awareness	Ensure that education programmes and training on disaster risk reduction are in place in schools and local communities.
08	Environment	Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.
09	Preparedness	Install early warning systems and emergency management capacities in your city and hold regular public preparedness drills.
10	Reconstruction	After any disaster, ensure that the needs of the affected population are placed at the center of reconstruction, with support for them and their community organizations to design and help implement responses, including rebuilding homes and livelihoods.

Following section describes sequence of key requirements to be ensured; especially in pre disaster period, in order to reduce the risk associated with a settlement enhancing its resilience based on above described concepts, definitions and policy

frame works. Most importantly, it is focused on DRR in local context; Divisional Secretariat and local authority level, where action plan is vital for the implementation as most of the short comings are recorded in practical application. In this, it is



assumed that special attention should be given to the implementation of pre-disaster risk reduction options in order to take necessary actions to protect the lives of vulnerable community and expedite the post disaster rehabilitation and reconstruction work.

### 3 KEY REQUIREMENTS FOR A SUCCESSFUL DRR APPROACH

Key requirements to ensure a successful DRR are described below which was formulated through brainstorming on the basic principles discussed in the above section;

1. Conduct a proper hazard assessment and knowing the exposure to hazards considering magnitude and frequency of occurrences.
2. Conduct Vulnerability and Risk Assessment; identification of elements at risk by level of vulnerability and the level of risk each vulnerable element is exposed to.
3. Formulation of DRR options for each risk category; both structural and non-structural measures as required. Also, cost benefit analysis of each option to be conducted and prioritized.
4. Community awareness and preparedness plan; extensive community awareness to be performed on the level of risk they are exposed and potential risk reduction options and role of the community. Especially, introduction of early warning system, hazard identification and evacuation plan will be vital.
5. Action plan for DRR; structural and non-structural measures for implementation, budgetary allocation, implementation mechanism, monitoring and evaluation plan and responsibility sharing etc.
6. Post disaster rehabilitation and reconstruction mechanism; restoration of basic services, temporary resettlements sites and management plan, resettlement mechanism with permanent shelter.
7. Institutional and administrative framework; there should be a responsible institution for each activity while overall coordination to be vested under one organization.
8. Accordingly, it should be ensured that the above 7 requirements are fulfilled for any disaster vulnerable settlements in order to minimize the risk. Following, section describes the action taken to mitigate the landslide risk associated with the Meeriyabedda settlement with reference to the report on Action Review Survey for Emergency Response on Meeriyabedda Landslide Case conducted under

JICA Technical Cooperation for Landslide Mitigation Project (TCLMP) with collaboration and cooperation with NBRO and DMC. Also, available documents were referred for further information.

### 4 OUTPUT OF THE ACTION REVIEW SURVEY FOR EMERGENCY RESPONSE ON MEERIYABEDDA LANDSLIDE CASE CONDUCTED UNDER JICA TECHNICAL COOPERATION FOR LANDSLIDE MITIGATION PROJECT (TCLMP)

This action review survey has been conducted under the objective to review actions taken by selected stakeholders including the community to find the gaps in emergency response and early warning system and come up with recommendations for further development of emergency response and early warning system. As revealed by the survey, actions taken to reduce the landslide risk at Meeriyabedda are summarized below;

#### Action 01:

In 2005, NBRO gave recommendations to evacuate 75 families living in the Meeriyabedda settlement after the identification of high hazard situation in the area.

#### Action 02:

In 2009, an awareness program was conducted by SLRCS, DMC and NBRO for the community living in high hazard areas with the participation of 300 families. Hazard mapping, evacuation drill and explanation of mechanism of landslide through role play has been mainly discussed.

#### Action 03:

In 2011, a letter was issued by the NBRO to implement the recommendations given in 2005.

#### Action 04:

In October 2014, the following sequences of actions were recorded;

26<sup>th</sup> October 2014 – Observations of some cracks and continued monitoring the cracks

27<sup>th</sup> October 2014 – Observations of the color of water changed into brown

28<sup>th</sup> October 2014 – Observations of some signals of landslide (small cracks). Communication between relief officer, DMC and NBRO officers Badulla and evacuation order was issued by GN, relief officer and estate management.



29th October 2014 - Landslide occurred at 7.30 a.m. instructed to evacuate community, Search and Rescue operations were initiated and led by the tri-forces.

Although, above major actions were performed during the past 10 years of period after the identification of landslide risk by NBRO in 2005, the landslide was activated on 29th October 2014. The entire Meeriyabedda settlement was buried and destroyed 37 people and all 75 estate building units.

## 5 Assessment of Key Actions by Key Requirements for DRR

Key actions taken for the DRR in Meeriyabedda were in reference to the key requirements for the DRR are described in the Section 3 which was developed based on principles in Disaster Management. Output of the assessment is described in the Table 02 given below;

Table 02: Level of achievements of key requirements DRR during pre-disaster period of Meeriyabedda

No.	Requirements for DRR	Key actions taken in Meeriyabedda in relation to the requirements for DRR
1	Conduct a proper hazard assessment and knowing the exposure to hazards	With the identification of level of hazard and elements at risk by NBRO in 2005 a clear recommendation had been issued to evacuate families living in housing units.
2	Conduct Vulnerability and Risk Assessment	
3	Formulation of DRR options for each risk category	Only recommended DRR option was to relocate 75 housing units in a safer location which was made by NBRO in 2005 and reminded in 2009 emphasizing its implementation as soon as possible.
4	Community awareness and preparedness plan	In 2009, an awareness program was conducted by SLRCS, DMC and NBRO for the community. In this, hazard mapping, evacuation drill and explanation of mechanism of landslide through role play had been performed
5	Action plan for DRR	There are no any records on action plan to relocate vulnerable families
6	Post disaster rehabilitation and reconstruction mechanism	There are no any such plans are recorded relevant to pre-disaster period
7	Institutional and administrative framework	National Council for Disaster Management (NCDM) is the apex level responsible body for execution of Disaster Management activities in the country chaired by H.E the President of Sri Lanka. Ministry of Disaster Management operate under the NCDM and all the line ministries, chief ministers and Governors of all provincial councils and opposition party in the parliament also members of the NCDM (Act No. 13 of 2005).

## 6 CONCLUSION AND RECOMMENDATIONS

This study was conducted under the main objective to assess the pre-DRR approaches that had been performed in the Meeriyabedda with reference to the basic requirements of the DRR. Accordingly, key requirements for DRR were evolved through extensive literature survey carried out on basic principles of Disaster Management and brainstorming sessions conducted among the scientific staff of NBRO. In addition, pre-DRR approaches followed in the Meeriyabedda were identified based on the Action Review Survey for Emergency Response on Meeriyabedda Landslide Case conducted under JICA Technical Cooperation

for Landslide Mitigation Project (TCLMP) with collaboration and cooperation with NBRO and DMC.

Accordingly, key seven requirements for DRR are; conduct a proper hazard assessment and knowing the exposure to hazards, Conduct Vulnerability and Risk Assessment, Formulation of DRR options for each risk category, Community awareness and preparedness plan, Action plan for DRR, Post disaster rehabilitation and reconstruction mechanism and Institutional and administrative framework. The assessment conducted with reference to Meeriyabedda settlement entirely buried by the landslide on 29th October 2014 reveals the following information and issues related to pre-DRR approaches followed based on key



requirements for DRR. According to the assessment, first three requirements have been fulfilled as hazard assessment and identification of risk elements had been done properly and informed to respective authorities for necessary actions in 2005. Also, only DRR option to relocate the families in a safer location was recommended. But, rest of the key requirements for a DRR had not been achieved causing entire Meeriyabedda settlement destroyed. In this, with the information revealed by the JICA survey, although the community observed possible signs of landslide two days before the landslide they have not felt the necessity to evacuate or had no any idea on evacuation routes or centres. As well as, there are no any records on action planning for the relocation; identification of potential lands, fund allocation and implementation responsibilities etc. Also, it is obvious that any post-disaster rehabilitation and reconstruction mechanism had been not formulated as Meeriyabedda landslide victims are still living in a temporary location for more than one year since the tragedy. Also, it is to conclude that although administrative and institutional framework for the implementation of disaster management activities in Sri Lanka has been established making disaster management as the every ones business under the provisions of Disaster Management Act No. 13 of 2005, there have been no any records of proactive approaches followed to formulate and implement action planning for relocation of the community or introduce proper evacuation mechanism before the disaster occurrence.

Finally, it is highly recommended to revisit DRR approaches of Sri Lanka mainly, its implementation at grass root level and make necessary amendments.

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