

# Issues and Challenges of Post Landslide Management in Sri Lanka

*(A case study of Meeriyabedda landslide in Badulla District)*

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## Abstract

*Landslide is a geophysical event that has become one of the most calamitous natural hazards in Sri Lanka. Approximately, over 50000 people have been directly affected by landslide during the last five years and thousands of people are living at risk situation today particularly in the Badulla, Ratnapura, Kegalle, Galle, Matara, Kandy, Kaluthara districts. Since many unexpected adversities are emerged during and after the landslides, it is very important to have a proper mechanism of post disaster management in order to address the resettlement and rehabilitation phases. The study aims to identify the failures of post landslide management while proposing new strategies to overcome existing issues and challenges. By considering the catastrophic landslide hazard occurred in Meeriyabedda of Badulla District in 2014, 92 families who lived in temporary camps and the vicinity of the damaged area was selected as the study area in this research. Both quantitative and qualitative methods which enable data collection through questionnaires, structural interviews, semi structural interviews and case studies are used. A mix method of descriptive and analytical was applied along with cartographic techniques for data analysis and discussion. The results revealed that, among the three phases of post landslide management such as immediate response and relief, short term recovery and rehabilitation and long term reconstruction and development, most of the issues and challenges could be identified in the phase of long term reconstruction and development. Institutional arrangements that need to be directed to identify and resolve the emerging issues particularly in the process of resettlement, have*

*not properly functioned due to internal and external factors. Therefore, it is recommended that, a proper institutional coordination and commitment must be in the scene until are reached the durable solutions in the phase of reconstruction and development.*

*Key words: Landslide, Post Landslide Management, Issues and Challenges, Badulla District*

## **1. Introduction**

A disaster is an occurrence disrupting the normal conditions of existence and causing a level of suffering that exceeds the capacity of adjustment of the affected community (WHO; 2002).

Natural disasters are very common compare to the anthropogenic disasters. A natural disaster is a threat of naturally occurring event will have a negative effect on humans. Any natural process that causes a direct threat to human environment is can be identified as a natural hazard while disaster is identifying as the effect of a hazard on society, usually as an event that occurs over a limited time in a defined geographical area. (Nelson; 2014)

Among the various natural disasters, landslides have become a very frequent phenomenon due to natural forces like slope of the gradient, soil type, and rainfall as well as manmade forces like irregular land use, settlement patterns etc. Landslide is a downslope movement of soil, rock and organic materials under the effects of gravity and also the landform that results from such movements (US Geological Survey; 2008).

Due to the fatal landslides, number of deaths and injuries as well as property damage report by destructing the normal conditions of human lives. And it adversely affects to various services such as transportation, electricity, water supply and other infrastructure facilities also. Displacement also occur as the impact of massive landslides by hitting to socio

economic lives of the people. Even though, Sri Lanka is a small island, it is often affect by flash floods. Recently, an unexpected landslides occurred and effect on human life, their economy and natural environment. Therefore it should be rethink about management of disasters in Sri Lanka.

In landslide history of Sri Lanka, two devastated landslide were occurred in Ratnapura and Matara districts in 2003. In addition to that, Haguranketa affected severely in 2007 from the landslide. Due to landslides occurred in Sri Lanka in 2003, 22,328 people were displaced while 2006 and 2007 landslides displaced 26,989 and 27,497 people respectively. Since displacement is a life changing event, the resettlement process should be accelerated by addressing all dimensions of internally displaced person's problems. Since the landslide impacts on human life and property, government and institutions have adopted different disaster management strategies for minimizing the effects as well as for the response and recovery of affected people and areas. Disaster management basically can be divided in to three phases such as;

- Pre disaster management phase
- During the disaster phase
- Post disaster management phase

The post disaster management phase encompasses three main tasks; such as recovery, rehabilitation and resettlement. Although it is the conclusive part of the

disaster management cycle there is a less attention for the post disaster management process in developing countries like Sri Lanka. Therefore it should be considered the post landslide management process for the speedy recovery of displaced people. Generally, the post landslide management mechanism concerns, seeking lands possible for resettlement and reestablish livelihoods through giving durable solutions for socio cultural issues and challenges. Several strategies taken by Sri Lankan government to accelerate the recovery of displaced such as, ensure appropriate guidelines are available for identification of lands for resettlement of people living disaster prone areas, systems to support reconstruction/repair, replacement of damaged properties, and other recovery needs are available through government, private sector agencies and civil society organizations including risk transfer mechanisms and etc. But still there are some failures can be identified specially in post disaster resettlement and rehabilitation process in Sri Lanka.

Rifferring the Meeriyabedda landslide in Badulla district, most of the issues and challenges could be identified under this case as it was not well addressed the requirements of the affected community. Therefore, this attempt is to recognize the issues and challenges separately and introduce new strategies for the proper post landslide management mechanism.

## **2. Statement of the problem**

The landslide occurred in Meeriyabedda area in Kotabathma Grama Niladhari division in Haldumulla Divisional Secretariat Division in Badulla District was one of catastrophic disaster in Sri Lankan history. This was happened on 29th October 2014 at around 7.30 am. It was recorded as one of the worst and huge landslides next to the Aranayaka in 2016.

Meeriyabedda landslide affected to 330 people of 92 families in Ampitikanda tea estate. Approximately 63 buildings including Houses, Hindi temple, Community Center, Dairy collection Centers, Boutiques, Telecommunication Center, and 3 Estate bungalows were destroyed due to the landslide (Disaster Management Center 2014).

As this landslide was one of catastrophic event of landslide history in Sri Lanka, the issues related to the poor post disaster management process in Meeriyabedda landslide were highlighted. Because of the huge impact of this landslide already it displaced 92 families and devastate their livelihoods, property, social and infrastructure facilities also. In addition to that, 15 families have been evacuated recently. Approximately 330 people displaced due to this catastrophic event and later on they were resettled temporary in Poonagala, Ampitikanda and Makaldeniya areas. Even two years after IDPs are still living in welfare centers and they have to face several socio economic and cultural issues at different level. This shows the failures in post disaster management mechanism including poor resettlement process regarding to landslides.

In this background, it is timely needed to address the issues of post disaster management including resettlement and rehabilitation. Within the frame of research problem, few questions can be formulated as follows.

- What is the nature of post landslide management in relation to Meeriyabedda landslide?
- What are the impacts on landslide induced internal displacement?

- What are the causes for issues and challenges in post landslide management?
- What are the new strategies to overcome the issues and challenges of post landslide management?

In the light of foregoing, the study has set three objectives for conducting the research;

1. To examine the impact of displacement due to the meeriyabedda landslide.
2. To identify the influential factors to post landslide management.
3. To seek the possibilities to overcome post landslide issues and challenges.

### 3. Literature Review

Abansi and Dizon (2013) describes “Post-disaster rehabilitation and recovery encompass support strategies that are geared towards the restoration of human-centered services and infrastructure, as well as the restoration of the physical and ecological integrity of the affected ecosystem”. As well as Keraminyage and Piyatadsananon (2013) described post disaster management process as the “top-down approach to design and implement post-disaster resettlement programmes are often influenced by spatial factors such as land availability and access to infrastructure facilities, failure to recognize socio-economic and cultural sensitivities of resettling communities have been noted as a common reason for unsuccessful resettlement programmes”.

One of key attempts is to introduce the resettlement model by Michael M Cernea in 1997. When concern about the Sri Lankan context, Deheragoda and Herath (2008) studied based on the topic of social impacts of landslide disaster with Special Reference to Sri Lanka.

Even though landslide are viewed from several perspectives, the issues and challenges of post landslide management has been touched very limited. One of research was done by Fernando and Kumari (2015) and they emphasized that, failures of post disaster management procedure in case of Meeriyabedda landslide. There is another study also based on the progress of post disaster management process of landslides in Sri Lanka: with special reference to two major landslides in Budulla district by addressing the failures in post landslide mechanism in Sri Lanka.

As it identified the issues faced by the IDPs of Meeriyabedda landslide, it illustrated that, what would be the factors reconsidered for proper post landslide management process. As well as it focused the issues and challenges of resettlement process by achieving the objectives of the study. After identified the issues and challenges, this study proposed new strategies to overcome these issues. Because of that, by going through this kind of research it can be introduced new suggestions and identify the durable solutions for reduce the failures in poor post landslide management process in Sri Lanka. In addition, this kind of research can be used as public opinion in policy making to prepare a better policies by appreciating the community support. Therefore finally it can be highlighted that, practically this kind of research would be important to the institutions related to the disaster management

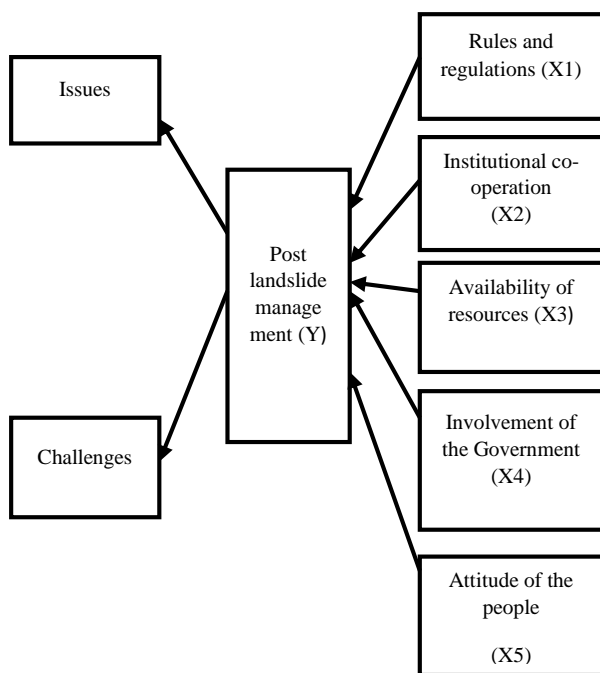
### 4. Methodology

#### 4.1. Conceptual framework

The issues and challenges of post landslide management could be considered as the dependent variable (Y). There might be several factors that could

be assumed to affect in positive and negative mean on post landslide management. Those factors here are established as independent variables ( $X_i$ - $X_n$ ) as shown in the Figure 5.1;

**Figure 4.1:** Dependent variable and assumed independent variables



#### 4.2. Hypotheses

Null and alternative hypothesis are created for this study shown as follows;

$H_0$  – “There is no impact of selected variables such as rules and regulations, institutional co-operation, availability of resources, involvement of the government and attitude of the people on issues and challenges of urban flood hazard management”

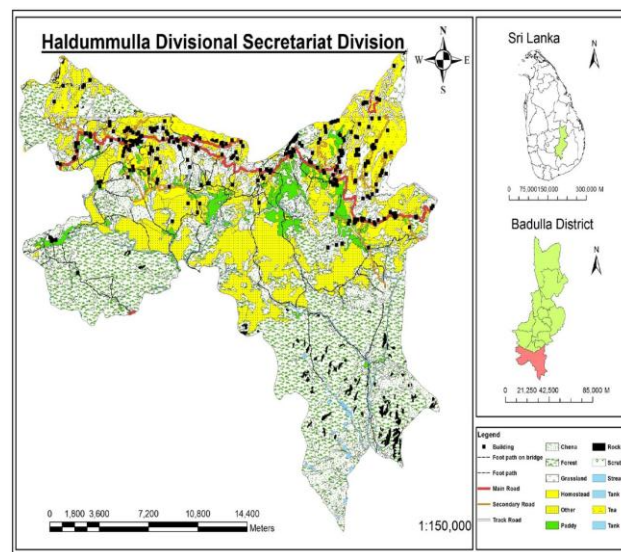
$H_1$  – “There is an impact of selected variables such as rules and regulations, institutional co-operation, availability of resources, involvement of the

government and attitude of the people on issues and challenges of urban flood hazard management”

#### 4.3. Sampling

Haldummulla DSD located, from North to Haputale DSD, from South to Monaragala and Rathnapura districts, from East to Monaragala district and from west to Nuwara Eliya district in Uva province in Sri Lanka. The extent of the Haldummulla DSD is 430.5 Km<sup>2</sup> and it includes 39 Grama Niladhari divisions. Majority of the area located in 305-1400m elevation (1000-3000 feet), minor parts of the area located in 150-305m elevation (500-1000 feet) in Haldummulla DSD (Resource Profile; 2015).

**Figure 4.2.** Haldummulla Divisional Secretariat Division



The total population of this study represents the all affected people from Meeriyabedda landslide in 2014. They have categorized as resettled, returnees and living with friends and relatives. Sample population of this study was selected from these three categories. It was suggested that; select 50% from the total population of living under three categories by using

the snow ball sampling. The sample size as shown in table 4.1.

**Table 4.1.** Sample Population

Resettled Population	Returnees	Live with relatives	Total Population
76 Families	12 Families	04 Families	92 Families
Resettled Population	Returnees	Live with relatives	Total Population
76/2 = 37 Families	12/2 = 6 Families	4/2 = 2 Families	45 Families

#### 4.4. Data collection

The primary and secondary data collected by using the following methods:

Primary sources – Questionnaire, Observations, Formal and informal discussions.

Secondary sources – books, journals, institutional reports, web sources.

#### 4.5. Analysis of data

Data analysis of the study may concern qualitative techniques as this research belongs to the quantitative research. Therefore, descriptive methods used for the data analysis by using;

- Graphs
- Pictures
- Tables

In addition to that, as this research mainly concerns the qualitative data, it used the qualitative data analysis techniques also such as content analysis. Accordingly, this research mainly based on the descriptive analysis.

## 5. Results and discussion

### 5.1. Nature of post landslide management

For the clear identification on nature of post landslide management, it divided into three categories as mentioned below.

- Emergency Response and Relief
- Short term: Recovery and Rehabilitation
- Long term reconstruction and development

Among those three phases, emergency response and relief as well as short term recovery and rehabilitation processes were succeeded than the long term reconstruction and development.

**Table 5.1.** Success of the Emergency Response

	Most Successful	Successful	Unsuccessful
Rescue	✓		
Evacuation	✓		
Camping process		✓	
Donation Distribution			✓

Emergency response and relief includes several activities such as rescue, evacuation, camping process and donation distribution. Among them, immediate rescue process implemented during just after the disaster and people have been evacuated with the guidance of DMC in Badulla district. As well as they requested public support from the people, who are capable to support for the tri-forces. The rescue process and evacuation were most succeeded in this case with the involvement of government agencies and

tri forces. After the evacuation affected community were moved to several temporary camps such as Poonagala Tamil School, Poonagala Sinhala School, Gapkade camp. The government were provided basic needs of the affected community like foods, cloths, sanitary facilities and other things which they want. But according to the affected community’s opinion, unequal distribution of donations was major issue that occurred in the emergency response phase as some of people were highly supported while others having less attention even for their basic needs.

**Table 5.2.** Success of the Short term Recovery and Rehabilitation

	Most Successful	Successful	Unsuccessful
Camping Process		✓	
Donation Distribution		✓	
Restoration of Basic Service, Infrastructure			✓
Restoration of Livelihoods			✓

Short term recovery and rehabilitation includes the restoration of basic services, infrastructure and livelihood. In here, camping process considered under the short term recovery also as IDPs were lived nearly two years in welfare centers after the disaster. Donations were equally distributed among the people in here than the emergency response as people said. But restoration of basic services such as communication and electricity as well as restoration of infrastructure facilities like roads, water supply were

delay to reconstruct because of inadequate attention of the government. Therefore, returnees also had to stay considerable time in welfare centers. Not only that, the government support for restoration livelihoods of IDPs also very less as the people mentioned.

**Table 5.3.** Success of Long term Reconstruction and Development

	Most Successful	Successful	Unsuccessful
Land selection for Resettlement			✓
Resettlement			✓
Accessibility to Livelihoods			✓
Post Resettlement Assistance			✓

All the activities regarding to the long term reconstruction and resettlement process related to the Meeriyabedda landslide were failed as shown by the above table. It took long time period for the land selection and other pre resettlement activities also. Therefore the resettlement procedure also delay and many failures occurred like poor accessibility to livelihoods and lack of socio cultural values. After the resettlement, it is essential to have post resettlement assistance from the government to recover as soon as possible. But there was no any assistance after the resettlement. Therefore easily it can be recognized as shown by the above tables, most of the issues of post landslide management were occurred in long term reconstruction and development procedure.

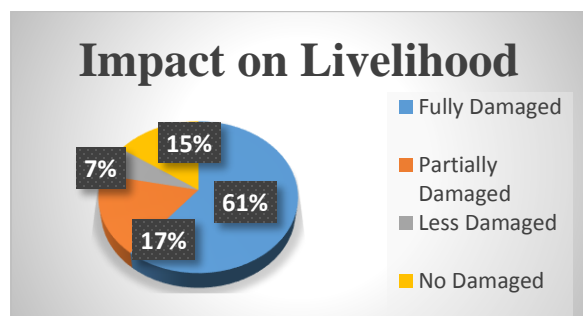
5.2. Impact on Landslide Induced Internal Displacement

The impact of landslide induced displacement can be categorized as follows.

- Social impact
- Economic impact
- Cultural impact

Social impact have been identified based on the impact on family, social relationship, education and health. Deaths, furiously injured and physical disable situations could be identified as the social impact on family. Accordingly 14 deaths were reported while furiously injured and physical disable people reported as 08 altogether. When concerning the economic impact, their livelihoods have been fully, partially and less damaged as shown by below chart.

**Figure 5.1.** Impact on Livelihood



Accordingly 28 families or the 61% have completely loss their livelihoods while partially and less damage reported 17% and 7% respectively. It have been discovered that, economic impact was higher than the socio and cultural impact in case of Meeriyabedda.

5.3. Issues and challenges of post landslide disaster management

The total process of resettlement and rehabilitation is examined under this theme. The discussion on this matter will be forwarded as follows.

- Issues of emergency response and relief phase
- Issues of short term recovery and rehabilitation process
- Issues of long term reconstruction and development process
- Issues regarding to these three phases as well the causes for the issues also identified for the minimum clarification. Accordingly,

**Table 5.4.** Issues and causes of Emergency Response and Relief

Issues	Causes
Unequal distribution of donations	Lack of strong institutional arrangements, Lack of responsibility provision
Inability to attending schools to school children	Failures in providing educational facilities at the initial stages
Socio cultural issues	Lack of socio cultural studies of the community Attitudes of the people
Delay of construction of the damaged roads and other infrastructure facilities	Lack of institutional support, Lack of responsibility provision

Source: Field Survey, 2016

Accordingly it can be identified that, most of the issues reported such as unequal distribution of donations, socio cultural issues, delay of construction of infrastructure facilities have occurred due to the lack of strong institutional arrangements. These issues were reported from both phases such as emergency response and short term recovery and rehabilitation phases as shown by the table 5.4 and 5.5.



**Table 5.5.** Issues and causes of Short term Recovery and Rehabilitation Phase

Issues	Causes
Unequal distribution of donations	Lack of strong institutional arrangements, Less of satisfaction of people
Conflicts between host and affected community	Lack of social consideration, Negative attitudes of the people to commitment
Socio cultural issues	Lack of socio cultural studies, Attitudes of the people
Lack of infrastructure facilities	Lack of consideration of basic needs of the people

Source: Field Survey, 2016

Addition to that, prominent issues and causes were identified under the phase of long term reconstruction and development also.

- Long delay in resettlement implementation
- Land selection, Houses designing and construction issues
- Unexpected disasters Eg: Wild Elephant threat
- Newly constructed houses have been abandoned for not having any means of livelihood opportunities at or near to the resettlement
- Newly constructed houses have been abandoned due to poor accessibility to existing public and social infrastructure

The major issue was the long delay in resettlement implementation as the result of poor institutional arrangements, lack of community participation and informal involvement of the government. The new resettled area has been also just identified disaster prone area and it proves the mechanism failures. These

are also occurred lack of interdisciplinary teams for specific functions. Among the three phases discussed above, the later one has several issues recorded. The study revealed that most of the issues emerged due to the lack of major institutional arrangements.

### 5. Conclusion and recommendation

Despite Haldummulla DSD is declared as a landslide prone area by the authorities, people have neglected the warning due to different reasons. Most significant factor is most of them did not have option to leave their place of origin. The awareness of the post landslide management is very less among the vulnerable community.

Most of issues as well as challenges were identified under the phase of long term reconstruction and development. The lack of strong institutional arrangements has caused to arise this situation. In addition, it can be concluded people’s attitudes also make considerable influence to increase the complexity of the issues and challenges of post landslide management. By going through the findings it can be recommended that,

- Establish a proper mechanism to enhance the institutional coordination and commitment.
- Update the laws of environmental protection and to implement them at any circumstances.
- Promote regular land use and limit the cultivations at steep slopes
- Modern methods for protecting the lands from soil erosion
- Maintain a proper hydrological system

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