

## **Social Impacts of Landslide Disasters with Special Reference to Sri Lanka**

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### **Abstract**

*Disaster can be explained as an occurrence disrupting the normal conditions of existence and, causing a level of suffering that exceeds the capacity of adjustment of the affected community. Any disaster event is tagged with tremendous impact to the society or community. Thus, Social Impacts of Landslides can be defined as “the consequences to human populations of any Landslide incident that alter the ways in which people live, work and spend their leisure time, relate to one another, organize to meet their needs and generally cope as members of society including changes to the cultural norms, values, and beliefs that guide and rationalize their cognition of themselves and their society”. Hence, any consequence caused as a result of a landslide, which eventually leads to alter the day to day life-styles, livelihood patterns, cultural integrity and social networks of affected family/s or a neighbourhood can be classified as a Social Impact.*

### **Scope of the Problem**

*Of the 65,000 sq. km of the land area of the island of Sri Lanka, nearly 12,000 km<sup>2</sup> spread over seven of its administrative districts are highly prone to landslides. Scientific studies have revealed that the frequency of landslides is on the increase particularly because of the unplanned intensive cultivation, non - engineered constructions, deforestation, neglect of land, and ever increasing human intervention. Although humans create and contribute to landslide events, they are also the sufferers of these dreadful events. This paper will focus on the Social Impacts of Landslide Disasters in Sri Lanka with special reference to May -2003 and January -2007 incidents in Matara and Nuwara Eliya Districts respectively.*

**Objective** *of this paper is to explore the Social Impacts of Landslides with reference to Deaths, Displacement, Personnel & Social Insecurity, Health Issues, Issues of Women & Children, Psychological Reactions, Involuntary Resettlement, Legal Issues and Recovery & Reconstruction Needs. This paper includes information gathered and experiences gained from the research conducted among the May 2007 landslide affected families in the Deniyaya area of the Matara District and the field observations carried*

*out among families that experienced similar disasters in mid January 2007 in Walapane and Hanguranketha areas of the Nuwara Eliya District of Sri Lanka.*

*A Questionnaire Survey was carried out among the affected families just one week after the May-2003 landslides in the Southern Sri Lanka. In the **Research Methodology** techniques such as field observations, recording of case studies, collection of spatial data and geographical coordinations of the affected areas using Global Positioning Systems (GPS - MLR - SP24) were also used in this research headed by the author of this paper, in collaboration with several members of the academic staff and about 70 under graduates of the Department of Geography of University of Sri Jayewardenepura Sri Lanka. Field observations and informal interviews were conducted a few days after the January - 2007 landslide incidents in central Sri Lanka among the affected families and formal meetings were held with officials to collect information.*

#### **Major Issues Addressed**

*The population and social structures of the landslide affected areas were seriously affected mainly by the number of human deaths. During the period 1869 to 2003, there were about 178 reported landslides all over Sri Lanka, causing over 455 deaths. The impacts of landslides have worsened during the last 25 years and 85% of deaths have occurred during this period. The worst ever landslide disasters in the history of Sri Lanka were reported in May-2003 with 188 deaths and 139,000 displaced. Further, the landslides of January - 2007 in Sri Lanka have claimed 21 lives while over 4,200 have been displaced. In the past 25 years from 1982 to 2007 landslides have killed 403 persons and affected over 150,000 families while around 28 billion rupees (US\$ 28 million) had been incurred on relief and reconstruction efforts. Landslide disasters in May-2003 were solely accountable for 96% of the above expenditure.*

**Conclusion** *Social impacts of landslide disasters in Sri Lanka are immense and the effects more pronounced during the last 25 years. Thus landslide mitigation strategies that harmonize with the natural environment need to be implemented vigilantly in landslide prone areas.*

**Key Words:** *Disasters, Landslides, Social Impact Assessment, Health Needs in Disaster, Displacement in Disaster*



## **(1) Introduction**

Anything that befalls humans of a ruinous or distressing nature: a sudden or great misfortune, mishap, misadventure, a calamity is normally called a disaster. Scientifically, disaster can be defined as "an occurrence disrupting the normal conditions of existence and, causing a level of suffering that exceeds the capacity of adjustment of the affected community (Loretti 2000). Such disasters are categorised as Natural, Man-made or Hybrid.

Landslides are basically grouped into the category of natural disasters as such events are by and large triggered-off by natural phenomena such as heavy rains, lightening, earthquakes etc. But most of the occurrences are due to man-made causes such as wrong land use practices, alterations to the landscapes etc. Social as well as economic losses due to slope failures are great and apparently are growing as the built environment expands into unstable hillside areas under the pressures of expanding populations. Human activities disturb large volumes of earth materials in construction of buildings, transportation routes, dams and reservoirs, canals, and communications systems, and thus have been a major factor in increases in damages due to slope failures. Landslides are responsible for considerably greater economic and casualty losses than is generally recognized; they represent a significant element of many major disasters in which the magnitude of their effects is overlooked by news media. Thus, in most parts of the world including Sri Lanka, landslides have caused major Social Impacts on people, their homes and possessions, social networks and lifelines.

Deheragoda and Karunanayake (2003) have cited in Landslides Disaster May 2003: Research Report on Kotapola Divisional Secretary (DS) Division, Matara District, that of the 65,000 sq km of the land area of the island of Sri Lanka, nearly 12,000 km. spread over seven of its administrative districts are highly prone to landslides. Such landslide prone areas encompass about 20% of the island of Sri Lanka where over 30% of its total population live. Scientific studies undertaken by National Building Research Organization (National Building Research Organization 2001) reveal that the frequency of landslides is on the increase particularly because of the unplanned intensive cultivation, non - engineered constructions, deforestation, neglect of land, and ever increasing human intervention. The losses due to landslides have been staggering. In 1989, following heavy rains, more than 55 lives were lost, 10,000 families were rendered homeless and a number of development plans had to be abandoned (National Building Research Organization 1996). In subsequent years (1993, 1994, 1997, 1999 and 2001) more and more occurrences of varying magnitude have been reported, particularly from the high altitude areas of Central and Sabaragamuwa Provinces of Sri Lanka.

In May 2003, over one and half million people in the districts of Ratnapura, Nuwara Eliya, Kalutara, Galle, Matara and Hambantota in Sri Lanka were severely affected by both floods and landslides. The most significant fact is that the Matara District, which had not been considered earlier as a potential landslides prone area was severely affected by catastrophic landslides in 2003 and accounted for over one third of the losses and 47,642 families out of the total affected in the country. According to National Disaster Management Centre (2003) the total material loss, Island wide is estimated at over Rs. 2.7 billion or US\$ 27 million. A similar phenomenon was reported in Kandy, Nuwara Eliya and Sabaragamuwa districts in January - 2007 creating a huge Social, Economic and Physical Impact. The worst affected areas were Walapane and Hanguranketha in the Central Province where 21 deaths were reported while over 80,000 people were displaced in 80 camps. According to the Ministry of Disaster Relief Services of Sri Lanka, a sum of Rs. 5 million (*approximately US\$ 50,000*) had been allocated for relief assistance, immediately after these disasters.

## (2) Social Impacts

Disasters exceed the capacity of the affected communities for adjustment and as a result exert tremendous Social Impacts on them. For example, disasters have killed *nearly* 77,000 people the world over in 2003 alone. However, these figures refer only to immediate casualties and do not speak of the casualties of secondary effects. When taking a wider view of the worldwide disasters in the period between 1994 and 2003, nearly 5,680 disasters were reported. During the same period about 673,000 were killed, over 5.5 billion people were affected and an estimated damage of US\$ 700,000 million was reported the worldover (International Federation of Red Cross and Red Crescent Societies) (2004). Taking the world as a whole Asia remained the continent most frequently struck by disasters with 41% of the total number of disasters recorded, 71% of people reported killed, 90% of people reported affected and 57% of estimated damage. A similar trend can be witnessed in Asia in relation to the impact of landslide disasters during the same period (*Table 1*).

**Table 1.**

### World Disasters During 1994 - 2003

Disaster Impact	All Disasters			Landslide Disasters		
	World Total	Asia Total	% of the World Total	World Total	Asia Total	% of the World Total
1. Total Number of Reported Disasters	5,677	2,328	41	186	105	57
2. Total Number of People Reported Killed	673,070	480,001	71	8,679	6,162	71
3. Total Number of People Affected ( <i>In Thousands</i> )	2,582,251	2,342,913	90	3,194	2,813	88
4. Total Amount of Disaster Estimated Damage ( <i>US\$ Millions</i> )	691,426	390,099	57	427	212	50

*Source: International Federation of Red Cross and Red Crescent Societies (2004)*

Due to their fragile nature, Social Impacts are characterized and defined in many perspectives. In the context of this paper the following definition is adopted after U.S. Inter-organizational Committee on Principles and Guidelines for Social Impact Assessment (2003). Accordingly, Social Impacts of Landslides can be defined as: “*the consequences to human populations of any Landslide incident that alter the ways in which people live, work and spend their leisure time, relate to one another, organize to meet their needs and generally cope as members of society including changes to the cultural norms, values, and beliefs that guide and rationalize their cognition of themselves and their society*”. Hence, any consequence caused as a result of a landslide, which eventually leads to alter the day to day life-styles, livelihood patterns, cultural integrity and social networks of affected family/s or a neighbourhood can be classified as a Social Impact.

### **(3) Social Impact Assessment**

The assessment of Environmental and Social Impacts has been an integral part of the project feasibility studies for quite sometime. The Social Impact Assessments (*SIA*) originated as a socio-economic component of Environmental Impact Assessment (*EIA*) studies, and has since expanded and developed considerably, in both the developed and developing countries. Such SIAs are normally been carried out as an exercise to assess potential positive and negative impacts of any proposed project together with the overall EIA report. In spite of improvements in recognition, prediction, mitigative measures, and warning systems - the physical, material and economic losses and casualties, and thereby the negative Social Impacts due to landslides - appear to be growing as a result of increasing population pressure on the landslide-prone areas. Very often the post-disaster impacts are studied and analyzed by focusing on their physical, environmental, economical and social consequences.

In the case of disasters (*including landslide disasters*) and project failures, Post - Disaster Social Impact Assessments are required to ascertain the social consequences of the destruction. Similar Post Disaster assessments are also carried out to ascertain the economic, environmental and physical consequences or impacts of such disasters. By its very nature most of the physical, environmental and economic impacts are on one hand tangible, thus can be assessed in monetary terms and the compensation or insurance claims can also be determined, in relation to losses incurred through physical destruction, material loss, opportunity cost and cost of reconstruction and rehabilitation including the cost of relocation or resettlement.

But the assessment of the Social Impacts is a comparatively difficult task because the impacts of some of the losses are invisible and non tangible on one hand, and not spontaneous on the other. For example, the loss of life of the chief of household would have a different cumulative social and psychological influence on the rest of the family members than losing a younger member or relative of the same family. Similarly, loss of a mother will have a tremendous negative social impact on the whole family, particularly on the children. Further, incidents like loss of lives, livelihoods and property, displacement, breakdown of social networks etc. are normally followed by mental stress and trauma, human suffering and misery, change in lifestyles, livelihoods and feeling of in-betweenness etc. The Sociological impacts of such incidents are usually built up at a very slow pace, normally as a very slow process.

#### **(4) Damage Overview & Recovery Needs**

The studies in the landslide ravaged areas of Kotapola and Deniyaya DS Divisions - Matara District in May- 2003 (Deheragoda and Karunanayake 2003) and field observations in Hanguranketha, Walapane and Gampola DS Divisions of Nuwara Eliya and Kandy Districts (*January - 2007*), revealed that damage overview and recovery needs form an essential precondition to mitigate the Social Impacts among the affected communities. The following factors are to be considered with utmost priority in the case of assessment of Damage Overview and Recovery Needs (Petley and Bullmar 2006).

##### **4.1. Deaths**

The population and social structures of the landslide affected areas were seriously affected by the number of human deaths. During the period 1869 to 2007, there were about 178 reported landslides in all over Sri Lanka, causing over 476 deaths (*Table 2*). However over 85% of these deaths have occurred during the last 25 year period due to the high intensity of landslide incidents with greater human, material and social consequences (*Table 3*).

The worst ever landslide disasters in the history of Sri Lanka were reported in May 2003 with about 188 deaths. The devastation caused by floods and landslides in May - 2003, was unprecedented going by the institutional memory of the state and the personal memory of the people (*Table 4*). Women and children made up a large share of the victims, as many women were caught unawares in houses when the landslide occurred (Deheragoda and Karunanayake 2003). At the same time, recent landslides of 2007 of Pusellawa, Walapane and Hanguranketha claimed 21 lives.

## 4.2. Displacement and Shelter

Strong community cohesion is a common feature of small isolated rural communities, and particularly in landslide prone Central, Sabaragamuwa and Southern Provinces of Sri Lanka, where there is a very close-knit social structure and social support mechanism through the extended family system, which has served as an important coping mechanism for emotional, social and financial needs during the post landslide disaster recovery phase. However, the loss of human lives and the scale of material damage and displacement have been so great in 1964, 1977, 1986, 1989, 1993, 1998, 2002, 2003 and 2007; that in many affected communities these support structures have also been destroyed. Over one and half million people in the districts of Ratnapura, Nuwara Eliya, Kalutara, Galle, Matara and Hambantota were severely affected by both floods and landslides during the third and fourth weeks of May - 2003. Deheragoda and Karunanayake (2003) found that two months after these disasters about 640,000 people or 138,973 families were still displaced in the affected districts. For the past 25 years from 1982 to 2007 landslides have affected almost 150,000 families and majority of them were 2003 - landslide disaster victims (Table 3).

**Table 2**

### Reported Landslides Occurrences in Sri Lanka (1869 - 2007)

Year	No. of Landslides	Deaths	Year	ofNo. Landslides	Deaths
1869	1	-	1989	17	55
1886	2	-	1992	6	-
1888	4	-	1993	9	31
1893	1	-	1994	5	8
1895	1	1	1995	4	-
1902	2	-	1996	8	1
1903	4	2	1997	6	15
1925	2	-	1998	1	-
1957	15	-	1999	10	3
1964	10	44	2000	1	-
1977	1	26	2001	1	2
1982	3	20	2002	11	13
1984	9	18	2003	20	188
1985	1	10	2007		21
1986	22	18	<b>TOTAL</b>	<b>178</b>	<b>476</b>
1987	1	-			

**Source:** Based on National Building Research Organization (2002), Deheragoda & Karunanayake (2003) & Field Observations in Kandy and Nuwara Eliya Districts by the Author - 2007.

**Table 3: Impact of Recent Landslides in Sri Lanka (1982 - 2007)**

Year	Affected Area	No. of Families Affected	Expenditure on Relief Assistance (SLRs.)	Deaths
1982	Kandy, Kegalle, Ratnapura, Matale	593	469,475	20
1984	Kalutara, Badulla, Ratnapura, Kegalle	535	589,552	18
1985	Kandy, Ratnapura, Kegalle	32	31,988	10
1986	Ratnapura, Nuwara-Eliya, Moneragala, Badulla, Kegalle	1,975	4,272,888	18
1987	Badulla, Nuwara-Eliya	158	296,617	-
1989	Kegalle, Ratnapura, Nuwara-Eliya	1,733	4,599,250	55
1990	Badulla	370	158,600	-
1991	Badulla	70	66,100	-
1993	Badulla, Gampaha, Kegalle, Kandy	870	4,419,500	31
1994	Nuwara-Eliya, Ratnapura, Kandy	284	628,520	08
1995	Ratnapura, Kandy, Nuwara-Eliya	484	2,547,336	-
1996	Nuwara-Eliya	75	52,400	1
1997	Badulla, Moneragala, Hambantota, Kalutara, Kegalle, Matara	626	1,576,912	15
1998	Ratnapura	-	-	-
1999	Ratnapura, Bulathkohupitiya, Passara, Dehiowita, Ayagama	2	-	03
2000	Kalutara	-	-	-
2001	Madukanda	-	-	02
2002	Balangoda, Badulla, Haldummulla, Demodara	7	-	13
2003	Ratnapura, Hambantota, Matara, Galle, Kalutara and Nuwara- Eliya.	139,000	2,780,670,700	188
2007	Hanguranketha, Walapane, Kandy, Mahiyanganaya, Pussellawa	4202	20,00,000	21
	<b>TOTAL</b>	<b>151,016</b>	<b>2,800,379,838</b>	<b>403</b>

*Sources: National Building Research Organization (2002), National Disaster Management Centre (2007a), National Disaster Management Centre (2007b), UN Office for the Coordination of Humanitarian Affairs (2003) & United Nations Development Programme - Bureau for Crisis Prevention and Recovery (2004).*

*Note: US \$ 1 = SLRs. 112/=*



**Table 4:**  
**Impact Profile of May 2003 Floods and Landslides Disasters in Sri Lanka by District**

Disaster Indicator	Affected Districts						Total Sri Lanka
	Matara	Hambantota	Galle	Kalutara	Ratnapura	Nuwara-Eliya	
1. No. of Families Affected	47,627	2,241	27,479	27,021	34,473	132	138,973
2. Total Deaths	64	22	16	11	122	1	236
3. Total Missing	N/A	-	-	-	-	-	17
4. No. of Housing Units Totally Destroyed	2,389	413	1,737	1,102	3,376	286	9,294
5. No. of Housing Units Partly Damaged	7,005	1,216	10,448	2,300	9,291	-	30,260
6. No. of Families Displaced & living in Camps	N/A	-	-	-	-	-	3,391
7. No. of Wells Affected	8,051	-	5,973	4,268	7,452	-	25,744
8. No. of Affected Wells Remaining to be Cleaned	581	-	500	132	3,000	-	4,213
9. No. No. of Toilets Remaining to be Reconstructed	4,068	934	2,483	930	9,000	-	17,415
10. No. of Major Irrigation Schemes Affected	9	6	6	2	6	-	29

*Source: Deheragoda and Karunanayake (2003)*

#### 4.3. Personnel and Social Security

***Single-headed Households:*** Widows and single-headed households present a particular vulnerability in the landslide affected areas all over the world, particularly in the poverty-stricken rural areas, as they have to deal with their psycho-social distress as well as caring for children on their own. The loss of a mother has particularly negative physical and psychological impact on small children and infants, while the loss of the male head of family constitutes a serious blow to the economic livelihood of the household, significantly reducing its coping ability since the employment opportunities for women outside the household are limited. These personnel and social security issues have been witnessed in Sri Lanka in both 2003 Matara District (Deheragoda and Karunanayake 2003) and 2007 in Kandy and Nuwara Eliya Districts respectively.

***Security of Women:*** In the affected areas a common concern is that single women, widows and women headed households (*i.e. without a male guardian*) are reportedly reluctant to go to the camps for affected people, if these are located outside their local area, since they will be among unrelated men and strangers. This is a serious social concern particularly for mothers and young women. During the survey by Deheragoda and Karunanayake (2003) in landslide affected Diyadawa area in the Kotapola North Divisional Secretariat Division of Matara District in 2003 several cases of sexual abuse and harassment against such lonely women were reported (*See Case Study No. 1*).

International experience shows (International Federation of Red Cross and Red Crescent Societies 2006b), that protection of women and children is frequently violated under disaster and conflict conditions. Considering the prevalent social norms, it is important that the privacy in washing and changing clothes, breast feeding children and sanitation facilities should be ensured for the displaced women and girls. Pregnant women in the camps should also be ensured access to reproductive health care in view of the potential effects that the psychological and physical strains will have on maternal health.

#### **4.4. Health Needs**

Most of the affected families had to stay in refugee camps due to loss or damage to their houses and also due to the fear of the occurrence of further landslides. Environmental pollution, overcrowding, poor food and water supplies, and inadequate hygiene and sanitation in a disaster setting and in refugee camps, can lead to communicable diseases, including water-borne and vector borne diseases. There is also a need to raise awareness in camps of the risks of infectious diseases, epidemics, sexually transmitted diseases etc.

At the same time, routine provision of health care programs such as Immunization, Maternal and Child care, Family Planning, Nutritional supplement distribution and other public health services to the displaced and affected families in the midst of damaged infrastructure is also a big challenge to the public health sector. Pregnant women in the camps too have to be ensured access to reproductive health care in view of the potential effects which the psychological and physical strains will exert on their maternal health.

#### **4.5. Understanding the Reactions of Affected Persons**

People's feelings relating to disasters are ordinary reactions to extraordinary situations. When people experience high levels of stress, they respond with very individual patterns of predictable reactions. Reactions fall into four categories: cognitive, emotional, behavioural and somatic (Aysan and Oliver 1997; Swatzyna 1998).

*Cognitive Reactions* include recurring dreams or nightmares about the disaster; reconstructing the events surrounding the disaster in one's mind, in an effort to make it come out differently; difficulty concentrating or remembering things; questioning spiritual or religious beliefs; and repeated thoughts or memories of the disaster, or of loved ones who died in the disaster, which are difficult to forget (*See Case Study No.2*).

Field observations during the Social Survey and Case Studies carried out among the landslide affected families in May 2003 - Matara District provide ample proof of similar behaviour. The research team in its findings reported the witnessing of situations like feeling numb, withdrawn, or disconnected; experiencing fear and anxiety when things remind the individual of the disaster, particularly sounds and smells; feeling a lack of involvement or enjoyment in everyday activities; feeling depressed much of the time; feeling bursts of anger or intense irritability; and feeling a sense of emptiness or hopelessness about the future among many of the respondents. Such *Emotional Reactions* were observed by the research team among persons who lost everything as a result of the landslide disaster in Diyadawa Village - Kotapola North DS Divisions Matara District in May 2003 (Deheragoda and Karunanayake 2003) (*See Case Study No. 1*).

The *Behavioural Responses* of being overprotective of one's own and one's family's safety; isolating oneself from others; becoming very alert at times and startling easily; having problems getting to sleep or staying asleep; avoiding activities that remind one of the disaster, avoiding places or people that bring back memories; having increased conflict with family members; keeping excessively busy to avoid thinking about what happened; and being tearful or crying for no apparent reason were also commonly reported by those who responded to the Social Survey in the Diyadawa village in Kotapola North DSD - Matara District and in particular by those who had directly undergone the tragic experiences (*See Case Study No. 1*).

*Somatic Reactions* include insomnia, headaches, stomach pain, muscular tensions, increased heartbeat, and fluctuating body temperature, all of which may worsen as stress accumulates, culminating in acute illness.

Some of the examples of other psychological excitements are illustrated in Table 5.

**Table 5**  
**Probable Mechanism and Potential Injuries due to Landslides**

Mechanics	Potential Injuries
Mechanical Trauma	- Wounds, fractures, amputations
Compression Injuries	- Contusions - Crush-injuries
Mechanical Suffocation	- Closed airways - Respiratory insufficiency
Thermic Trauma	- Burns - Inhalation trauma - Respiratory insufficiency
Rapid Coldness	- Hypothermia
Psychological Excitement (* <i>Claustrophobia is an anxiety disorder that involves the fear of enclosed or confined spaces</i> )	- Psychological imbalances - Panic disorders - PTSD – Post Traumatic Stress Disorder - Claustrophobia *

*Source: der Heide (2006)*

Psychological support for these communities is a must, but such help still remains an inaccessible luxury not only for the affected community in Diyadawa but also for people in similar stressful, critical traumatic or life-threatening situations elsewhere in Sri Lanka. Definition of psychological support clearly indicates that assistance can be provided by almost anyone able to feel and show empathy by understanding the experience of those affected by traumatic events, and seeing the world through their eyes (Danish Red Cross 1993). Empathy is also the capacity to listen carefully and ask clarifying questions. "Active listening" is a basic skill. It requires that the helper listen carefully and show the person respect, create the environment for the person to talk and react to the incident. This process takes time. Friends and family provide most psychological support. Many countries use semi-professionals or "para-professionals", caring individuals with a limited amount of focused training. This requires well-qualified supervisors and a clear system of referrals to professional institutions and resources. A small percentage of affected individuals may be served by mental health professionals (Fernando and Fernando 1997).

*Psychological Response:* Disasters do not necessarily render victims helpless and inactive, and even in sudden-onset events, few people panic. This has implications for planning based around the psychosocial resources available within the community, which may greatly enhance communities' capacity to react. In the case of landslide disasters in Kotapola DS Divisions, the affected community was the first to rise against the challenge. The Case Studies of Diyadawa (*Kotapola North GN Divisions, Matara District*) by Deheragoda and Karunanayake (2003)

revealed how effective the communities' indigenous capacity to cope was. Furthermore women's gendered role in South Asian society as nurturers and carers for the young and the old have enabled them to develop particular skills for survival. These skills are often overlooked by policy makers and relief operators. A focus on and an analysis of the gender relations and social norms of different societies and communities is essential for the understanding of survival mechanisms and the development of viable disaster management and disaster mitigation processes (Fernando and Fernando 1997).

The US Federal Emergency Management Authority has identified five trends in psychosocial responses to disaster, which highlight the capacity of communities to help themselves as well as indicating priorities for responding personnel (International Federation of Red Cross and Red Crescent Societies (1998).

- I. First, victims are not left helpless by the disaster, and are often active rather than passive in their response. Emergency managers should anticipate and plan for goal-directed behaviour.
- II. Second, most victims will reflect typical stress symptoms, at least in the short term, but many will recover with the support of family, friends and community networks.
- III. Third, particular social groups, especially women and children, may be more vulnerable to the psychological and social effects of disaster.
- IV. Fourth, a common feature is the emergence of networks of social support, both formal and informal, in which victims participate following a disaster. Such "therapeutic communities" are characterized by a rise in informal and volunteer help, increased community morale and increased altruistic behaviour. By nurturing the rise of therapeutic communities after disaster, emergency managers can facilitate the growth of an effective healing environment.
- V. Fifth, successful community-based and participatory approaches to disaster management often recognize local human capacity as well as vulnerability. Empowering those most affected by disaster through a role in decision-making, planning and response can have psychosocial and practical benefits.

The people exposed to disaster in Diyadawa have come close to death, which have shaken their belief in themselves and their values to the foundations according to Deheragoda and Karunanayake (2003). Life may be perceived as chaos, decreasing their ability to react adequately to the new situation, manage their lives and meet basic needs. Rebuilding the foundation will create meaning from chaos, and much of the foundation in life is built on human relations. It is important that victims know that the

reactions they experience in an emergency are not unique, and that they are ordinary reactions to extraordinary situations. Without this reassurance, victims may feel they are "going crazy" or becoming incapable.

#### **4.6. Shock and Trauma**

Even though not catastrophic as man made disasters, curative health sector should be ready to manage the dead and injured victims of any landslide event and it will be more pronounced with the inaccessibility caused by the damaged road network. Table 5 illustrates the possible mechanisms of potential injuries due to landslide disasters.

During both the 2003 landslide disaster in the Matara District and the 2007 landslide disaster in the Nuwara Eliya District; the very high death toll and the number of severe injuries in addition to widespread material damage have resulted in long-term social and psychological consequences among surviving family members, particularly widows, single-parent children, orphans, and the elderly. Severe shocks and trauma are widespread among such bereaved families, particularly among children, and comprehensive psycho-social support is required, adapted to the social-cultural background of the affected communities. This will be a serious constraint for the well-being of affected people unless psycho-social and medical support is rendered by qualified personnel.

In the relief camps, the Government of Sri Lanka (*GOSL*) agencies and relief organizations attempted to settle households from each local community together. Many affected people seem to be reluctant to leave their areas, since their livelihood (*land and livestock*) is not only severely disturbed by the landslides but also by their displacement. In some cases, male household members have reportedly brought their wives and children to the relief camps while they return to their village to protect whatever possessions they have been left with. This situation was also witnessed in the landslide disaster hit areas of Kotapola North, Diyadawa, Mugunumulla, Nawalahena and Deniyaya Grama Niladhari (*GN*) Divisions of Kotapola DSD in Matara District (Deheragoda and Karunanayake 2003) as well as in the landslide affected areas observed in Hangu ranketa and Gampola DS Divisions in Kandy and Nuwara Eliya Districts in January 2007.

#### **4.7. Involuntary Resettlement**

Relocation of households and communities may take place when authorities declare specific, severely affected locations as too high-risk to allow further settlement. A measure of voluntary resettlement may also be expected in places affected by major land slides, or where affected people

have either been squatting or were renters. Apart from these situations, there is a wide social concern that relocation should be avoided where possible, and assistance should, to the maximum extent, be given to enable people to rebuild their homes to better standards in their old location. This would minimize the need for new land acquisition, which may constitute hardships for those affected by losing land or livelihood opportunities. However, such a policy could be implemented only in places where houses were damaged due to poor construction but not due to location in a high-risk area. If land acquisition or displacement of people for new housing or infrastructure is unavoidable, a social assessment process involving all stakeholders should be undertaken.

*Willingness to Relocate:* During the survey of landslide affected families in May 2003 - Matara (Deheragoda and Karunanayake 2003), an attempt was made to ascertain the perceptions of the affected families on willingness to relocate, when authorities decide to remove them from the vulnerable areas. This was a very sensitive issue for every family. All of them preferred to continue to stay at the present location if authorities gave them an assurance to the effect that the location is not vulnerable to a future disaster. Those who were either living in close the proximity to a landslide or whose houses were not seriously damaged have refused to express their “Willingness to Relocate”. This category represented 68% of the total respondents of the above survey and they were under the impression that making any commitment would be disadvantageous to them.

**Table 6**  
**Willingness to Relocate by 2003 Landslide Disaster Affected Families at Kotapola in Matara District of Sri Lanka**

Category of Preference	Totally Damaged Houses	Partly Damaged Houses	House Not Damaged but Inmates Evacuated	House Neither Damaged Nor Inmates Evacuated	Total Sample
1. Yes to On-Site Upgrading or Reconstruction	6	13	0	1	20
2. Yes to Off-Site Relocation	7	8	9	4	28
3. Yes to Site & Services Option	19	41	12	28	98
Total Responded	32	62	21	33	146
Not Responded	0	25	43	238	308
<b>Total</b>	<b>32</b>	<b>87</b>	<b>64</b>	<b>271</b>	<b>454</b>

**Source:** Deheragoda and Karunanayake (2003)

However the families that were directly affected by the disaster and those who live in the affected locations including those located within very close proximity to the affected places have responded to the question ( $N=146$ ) expressing their willingness to relocate. The most preferred shelter option was the Site and Services Option as per 67% of the total respondents. Under this option, normally the GOSL would identify a suitable

resettlement site, and allocate 10 to 20 perch land plots to each beneficiary family according to a layout plan, including a housing loan up to Rs. 50,000. However, in this particular instance the Government would provide a grant up to Rs. 100,000 for a completely damaged house and Rs. 40,000 for a partly damaged house. Further, under the Site and Services Option, the beneficiaries are supposed to construct their houses on Self-Help basis, while the National Housing Development Authority (NHDA) provides technical and supervisory assistance to the beneficiary families.

Among the families whose houses were completely damaged, over 57% preferred the Site and Services Option. The preference for this option among families whose houses were partly damaged is 66% (Table 6). Only 14% have opted for Upgrading or Reconstruction On-Site.

#### **4.8. Legal Issues**

It was witnessed during the recent landslides (2003 & 2007), that most of the affected families have lost all their important documents such as deeds, birth and marriage certificates etc. There will be serious problems for claiming compensation and proving the identity of affected individuals unless lost documents are easily recoverable. Also, in many landslide affected areas the local topography had changed rendering identification of land plots impossible. This may cause difficulties during rehabilitation stage, if land ownership becomes a condition for the provision of house reconstruction grants. However, a number of households may have held customary tenure rights. In case of the title holder's death such land may not be easily transferred to the legal heirs.

#### **(5) Reconstruction & Recovery Needs**

##### **A. Immediate Needs:**

##### **5.1. Provision of Shelter and Food**

Yet another social concern of landslide affected communities is the provision of temporary shelter and food in view of the onset of the rainy season and bad weather periods. This may have to provide for:

- I. *Individual construction of temporary shelter* in situ in the affected areas, where special precautions should be taken to ensure outreach to women, the elderly, and other vulnerable groups with limited mobility. Material support and guidance (*technical, location*) should be given to individual households with the ability to erect temporary shelter for themselves; and
- II. *Extended stay in relief camps*, to bring people safely through the bad weather.



## **5.2. Social Assessments**

Social Assessments should be undertaken to provide sufficiently detailed information about affected population (*gender disaggregated data, number of orphans, number of permanently disabled, livelihood information*) to design recovery efforts in accordance with the specific needs and requirements.

## **5.3. Protection of Vulnerable Groups**

Immediate initiatives should be taken to ensure the physical security of women and children in the temporary camps and shelters. In case of separated children, family reunification efforts should be given highest priority, and for orphans, culturally-sensitive interim and alternative care options need to be provided. Special attention should be paid to ensuring the inclusion of the disabled, the elderly, and other vulnerable groups in the relief efforts. Psycho-social support and legal protection should be provided through local capacity development. Awareness raising and training on child rights and child protection should be carried out targeting all concerned actors.

*Disabled:* A high proportion of the injured people will be permanently disabled. Exact enumeration is necessary to design social welfare or livelihood rehabilitation programmes for such persons. Special measures need to be taken, to cater to the specific needs of this group, including counselling, medical care (*to enable them to function within their limitations*), and support to achieve social inclusion and to ensure disabled children access to education. Some of these measures need to be taken in the immediate future and others in the medium term.

## **5.4. Coordination Among Agencies and Actors**

It is necessary to establish effective coordination among agencies and actors including all stakeholders in relief and rehabilitation efforts to ensure full coverage and technically and socially sound outcomes. Lack of such coordination has resulted in uneven distribution of relief among the affected communities and omission of some communities as witnessed in 2003 Landslide Disasters and in the 12/26 Tsunami in Sri Lanka. When affected families live in isolated locations with difficult terrain conditions sans proper access, they often receive less relief assistance and attention particularly from the NGOs and other organizations.

## **B. Longer Term Recovery Needs:**

### **5.5. Housing**

Shelter assistance packages should be developed based on the principles of community consultation and household-driven reconstruction as well as minimum relocation. Community Based Organizations (*CBOs*) may facilitate the reconstruction process by mediating between households, local governments and locally-based building contractors and suppliers. A package developed through stakeholder participation for the May-2003 landslide affected community in Deniyaya area in Matara District of Sri Lanka is shown in Table 7.

### **5.6. Livelihoods**

The poorest of the poor are the most vulnerable to natural disasters. Such families often live in disaster prone marginal lands due to lack of landownership. Furthermore, they live in temporary or semi permanent structures on encroached land which make them highly vulnerable to disasters. This situation was seen in the in the Kotapola DS Division during the survey carried out among the May - 2003 landslide victims in the Matara District. The survey revealed that almost one third of the affected families were depending on Samurdhi benefits. Among the households whose houses were either totally or partly damaged, 34% were in receipt of a monthly income of less than Rs. 2,000 and almost 77% reported an income of less than Rs. 5,000 (*U.S.\$ 45/=*) per month. Therefore, a comprehensive package (*grants/loans/microfinance*) should be developed to assist such affected households in recovering their lost assets and means of livelihood.

Single-headed households will need extra support in re-establishing livelihoods, and a certain proportion of households may need support in creating new livelihoods. Community-based approaches may be used to reach the largest number of beneficiaries as soon as possible to reduce dependency effects. Careful targeting of the most vulnerable groups, including the high proportion of female headed households and permanently disabled, should be undertaken. Efforts to utilize local resources and employ local people in the rebuilding activities, including public works programs related to local recovery activities, should to the extent feasible provide local employment opportunities to the most needy.

### 5.7. Legal Rights

Action to restore lost records of property rights to housing, commercial property, and lands should be launched, with special assistance given to the poor, squatters and widows and orphans to overcome problems of property and inheritance rights. Special attention should be paid to the protection of women's and children's inheritance rights to land and property, and administration thereof by legal guardian until the child reaches maturity.

### 5.8. Community Participation

For the success of the reconstruction efforts and it is essential to preserve existing social networks which form the basis of support and mutual aid among the affected households. Local communities will need to be actively involved in the decision-making for and implementation of reconstruction activities, including decisions about rebuilding On-Site (*in-situ*)/relocation, housing, location and types of services and so on.

**Table 7**  
**Compensation Package Recommended with Shelter Options for Landslide Affected Families who Owned Different Housing Structures (Matara District-2003)**

Nature of Damage by Level of Vulnerability for Landslide Hazards	Recommended Shelter Option	Location Option	Housing Structure	Recommended Compensation (LKR)	Package
Any house located in a <b>Highly Vulnerable Location</b> irrespective of status of damage	Off-Site Relocation	Site & Services Location <sup>1</sup>	Permanent	75,000	A
			Semi-Permanent	45,000	
			Temporary	20,000	
		Own Land or Location of Individual Choice <sup>2</sup>	Permanent	100,000	B
			Semi-Permanent	70,000	
			Temporary	40,000	
Completely destroyed house located in a <b>Moderately to Low Vulnerable Location</b>	On-Site Reconstruction	Current Location <sup>3</sup>	Permanent	100,000	B
			Semi-Permanent	70,000	
			Temporary	40,000	
Partly damaged house in a <b>Moderately to Low Vulnerable Location</b>	On-Site Upgrading	Current Location	Permanent	50,000	C
			Semi-Permanent	30,000	
			Temporary	15,000	
<i>Note:</i>					
1. A small plot of land offered by the Government to Off-Site Relocates as a free grant with services (basic amenities) in a regularized site.					
2. Affected family may opt to relocate either in an own land or location of an individual choice.					
3. Affected family may opt either to On – Site Reconstruction or Upgrading at the current location.					

Source: Deheragoda and Karunanayake (2003)



**(6) Case Studies**

**6.1. Case Study No. 01**

**Address:** Nisansala Stores, Diyadawa, Kotapola North.  
**DSD:** Kotapola **GND:** Kotapola North  
**Date & Time of the Incident:** 17<sup>th</sup> May - 2003 at 6.20 p.m.  
**Interviewee:** Ms. P.T. Sujeewa Pramodini **Age:** 36 Years,  
**Civil Status:** Married

It was raining on 16<sup>th</sup> May 2003. I remember that it was terrific raining and continued for more than twenty-four hours. Though we are used to such heavy rains, this time, it seemed very unusual.

The 17<sup>th</sup> morning was very gloomy. Four of us, my husband and two the daughters and my self had "rotti" for breakfast. My husband went to the bakery to work. I started cooking lunch. My daughters were not in a mood to take lunch. They were frightened and were urging me to move away from home as they had seen evil dreams the previous night. That was worrying me. I did not notice any uneasy behaviour of animals. I did not even notice any symptoms of landslides.

This was not the first time we experienced such rains. In the past, we had seen earth slides. Nevertheless, to my knowledge nobody had died due to earth slips. After lunch, I went to the boutique with the two daughters.

I had a nap after the lunch. My younger daughter, who is eleven years was playing with her dolls. My elder daughter who was asleep for a while did not get-up even for lunch. Suddenly, the house got flooded. Around 3.00p.m. the water level increased up to the height of the bed. The flood level was increasing. I noticed that the water level had increased and the three-wheeler was completely under water. We rushed to the boutique where my husband was at work. He wanted us to be at the neighbour's house, as he could not stop his work abruptly. We were frightened to stay at the neighbour's and decided to get back to the boutique. We stayed at the boutique for sometime. Since there were 10 to 12 people in the boutique, I did not like to keep my daughters there. I sent them to a nearby safe place known to us. At about 4.45 p.m I went out to see my daughters. On my way, I saw the famous child actress of the "Sellam Gedera" of ITN with her brother playing on the road. Their mother too was with them. (All of them died due to a landslide that occurred little later) I picked up my daughters, and went back to the boutique once again within about half an hour or so. Then I came to know that a landslide had occurred in the Diyadawa area.

My husband and I were near the road, when 'Hichchi Aiya' (father of the child actress) asked us to help in widening the stream to facilitate the speedier flow of water. Water was thick and muddy. My husband suspected

a landslide in the upstream area. As I was leaning against the wall of the boutique looking at the forest in the mountaintop, I heard a deep screaming by a woman. Then I saw the falling trees. It was lightening in the forest area. The earth was slipping towards the valley very fast and all that happened in a flash. I just cannot explain it, I had never seen such an incident before. I shouted at my husband to come along and ran for safety. Hichchi Aiya rushed towards his house. My husband stayed at the same place, I wanted to collect my children from the boutique.

Then I heard a big noise. I saw a huge tree slanting towards me. A nearby culvert got dislocated due to the force created by the overflowing floodwater. I managed to cross the stream and reached the boutique. My husband, two children, and my brother-in-law managed to climb to an upstream location. We avoided going towards the stream. I saw a mud stream flowing towards us and warned Hichchi Aiya about it. We didn't know what happened to them the next minute.

The time was around 5.45 p.m. We spent about 15 minutes trapped due to fallen trees. It was getting dark and we wanted to get back. We were buried in hot mud and it was impossible move on. I held the hands of my daughters when crossing the stream. After some time, the elder daughter had let go my hand but I was still holding my neighbour's daughter. Younger daughter started screaming that "Akka" was missing. It was panic, I lost our house keys, and about Rs. 8,000 but managed to rescue her from the accident. The stream had become violent. I sent the children with my husband to the Tea Research Institute building for safety and returned home with my neighbour's children. My husband had kept our children at the Tea Research Institute with my brother-in-law and came back home and requested me to go to TRI, but I refused. My husband went back to TRI to pick up the children. By then, the stream has become somewhat normal. The villagers helped each other and the unity among them was remarkable. We came to know that the floods have destroyed Hichchi Aiya's house and the entire family was missing. On 18<sup>th</sup> May, at about 2.00 a.m. villagers managed to find the bodies of Hichchi Aiya's family members.

Two landslides had occurred near our house too. The first one had occurred at 5.45 p.m and the second one around 6.30p.m. It was raining heavily with "Diya Hena" at that time.

Our house was filled with mud. On 18<sup>th</sup> May, morning we were asked to evacuate to Godakumbura school. On our way to Godakumbura, I saw a green coloured pyjama, worn by Hichchi Aiya the day before, hanging from a tree in the stream. We found his body, which was handed over to his parents. After a while, the bodies of his two kids were also found. The house next to Hichchi Aiya too was destroyed. However, the inmates of that house had managed to evacuate just before the disaster.

At Godakumbura School there were about 80 displaced people. The people from the nearby village provided meals. We stayed for four days at the school. We spent the night at my parents house close to Godakumbura School as the school was not secure. Most of the people spent the night in the nearby houses for same the reason. We heard that few unknown dunken men had come to the school at night and tried to harassed some women. However, the Godakumbura villagers were helpful to us. Buddhist priest at the temple played a leading role in supplying food to the refugees and even helped us to overcome the agony by invoking blessings of the “triple gem”.

Grama Niladhari visited the school after two days and prepared a list of names of people who were affected. On 18<sup>th</sup> two police officers visited the camp and helped refugees. On 19<sup>th</sup>, the Army visited the area to find the missing people. District Secretary and the officers of the Divisional Secretary's office come to the camp about a week later. We are not aware of the steps taken by these officials to remedy the situation. We value the services rendered by the doctors of Deniyaya and Kosmodera hospitals. They treated the needy. After a week, a team of Indian doctors visited the camp and treated the needy.

After 20<sup>th</sup> May, various voluntary groups visited the area and distributed food items etc. They mostly visited convenient locations near the road. The really affected families who stayed in places that are difficult to reach were left alone by many relief parties. The government took steps to repair the damaged roads and restore the supply of electricity.

In my view, the distribution of assistance was done in a haphazard manner. Most of the assistance went to people who were not affected. The behaviour of a (*Name suppressed*) lady government officer in charge of distribution of food was deplorable. Nevertheless, every family in Diyadawa received some sort of relief. Although we received some food the loss we suffered due to looting of our furniture and other valuables was very high.

She owed about Rs. 10,000 to a nearby grocery store (*Name suppressed*), and the shop owner had been sending reminders for settlement while she was at the refugee camp. Of course I have some money to be collected from a few of these families and I am unable to collect them at this moment of destitution. Though people have some food, everyone is forced with difficulties. Vehicle owners have increased their hiring charges as the roads are damaged.

My children are not attending school yet. We still feel insecure and it is frustrating. We feel that we should not stay in this area any more. Even a

few showers remind us of the tragedy we all encountered during this spell. We do not want to be reminded of that tragedy any more. All of us are really depressed and cannot think of our future right now. Many are still experiencing fear and anxiety when reminded of what had happened.

**6.2. Case Study No. 02**

**Address:** Kotapola North, Diyadawa

**DSD:** Kotapola **GND:** Kotapola north

**Date & Time of the Incident:** 17<sup>th</sup> May - 2003 at 6.20p.m.

**Interviewee:**

Mr. W.A Jayantha (whose house was completely buried in a landslide and killed (7) of his family members)

I remember the calamity and the tragedy that befell on us on the 17<sup>th</sup> of May 2003. The entire area was under a very gloomy weather condition from 15<sup>th</sup> of May. Everyone was expecting heavy rains. Sporadic showers were experienced in several locations. Heavy rains started on the 15<sup>th</sup> of May between 3 to 4p.m. This rain continued throughout the next two days.

All of us villagers rushed home under the rainy conditions on 15<sup>th</sup> evening. Though our movements were restricted on the following day too, no one suspected of the impending calamity. Diyadawa being a village on the periphery of “Singharaja Rain Forest”, we are used to the kind of heavy rains that were witnessed during 15<sup>th</sup> and 16<sup>th</sup>. We were quite used to the prolonged rainy weather.

Heavy rains started on the early morning of 17<sup>th</sup>. Towards the afternoon, thundershowers began threatening the whole area. By the evening the entire village environment was gloomy and people looked frightened. Electricity supply had gone off and the communication lines were out of order. People started discussing unusual happenings like the emergence of new spouts in their compounds, increasing water levels in the streams, flow of hot and muddy water from the spouts, slanting and falling trees, small earth slips and uneasy behaviour of the domestic animals. Everyone looked puzzled. Moreover, none of us were aware of symptoms of a landslide. By evening, the intensity of lightning increased. The phenomenon known as “Diya Hena” (*Water Lightning*) that trigger landslides and earth slips were observed at regular intervals. The lightning was seen directed at the Diyadawa mountain range.

On that day I also returned home from Deniyaya around 5.30 p.m. There was no electricity in the area. The water level of the stream was on the rise.

The main landslide occurred at 6.30 p.m. in the area where I live. I was out of my house helping neighbours in moving their belongings with the help of a kerosene lamp. While helping others, I managed to get back home twice to get kerosene oil and some clothes to be given to needy. I wanted my family to cook some food for the affected people.

While helping others, I just thought of visiting my house. The whole area was in the dark and it was very difficult to move about. When I go there, may be at about 6.40 p.m., I could not see anything but a heap of earth where my house was.....

There was no trace of my house or its occupants. At the time of the incident, there had been my mother, two elder sisters, one younger sister, two nieces and one of my brothers-in-law in the house. Altogether seven members of the family had been buried under a heap of muddy earth.....

It is a nightmare and I do not know how to explain. My house was not located in a place where such a calamity could happen. It was on the bank of a small stream. We had no reason to be alarmed.

Just before the incident, the water level of the stream had dropped at once. This had been due to the blocking of the stream by a mound of earth. Soon it has turned into a huge reservoir. People down the stream had no knowledge of this development until the "dam" had burst causing a severe flood which had carried the earth down stream. It had been all over by 6.45p.m.

By 2.a.m. 18<sup>th</sup> Sunday or hours after its occurrence, people of the area reported the incident to the Deniyaya police. They were quick to react. By 2.30 a.m. the first police party arrived at the location where our house was. Police officers were placed to guard at locations where deaths were reported.

The severity of the calamity started unfolding by early morning of 18<sup>th</sup> Sunday. Then only I come to know that all the landslides in Diyadawa had occurred almost simultaneously. People in the neighbourhood were helping each other. Many had moved out from their houses for safety on the advise of their friends or relatives. Most of them realised only the following morning that their properties were either washed away or were badly damaged. Those who did not heed the advice to move out of their houses had perished. Some were under the false belief that nothing would happen to them, as they have done no wrong to others. Now It all had happened within seconds without warning. By 12.30 p.m. we managed to recover the bodies of seventeen people. The other villagers recovered two more



After all these happenings I always wonder and question myself of the fairness of the gods. If there is a spiritual force, why these had happened to good innocent people? Indiscriminate punishment to all on an equal footing is very unfair. ....

I wish that I too should have met the same fate as I have nobody to depend on now. Now I can't sleep at night, same bad dreams recur and frighten me. I have no purpose in living but only to invoke blessings on others who have perished. I was a tea smallholder with a net income of Rs. 15,000 per month. That source too is gone now. It is too early for me to decide on what to do, said Jayantha with tears in his eyes...



### **(7) Conclusion**

Social impact of landslide disasters in Sri Lanka is immense and it is necessary to identify such impact as a special category. It is revealed that the occurrence of landslides and their Social impacts were more pronounced during the last 25 years due to heavy development pressure on the landslide prone environmentally fragile areas of Sri Lanka. The benefits of pre-disaster mitigation measures outweigh the post-disaster expenditure by achieving considerable reduction in loss of life, property damage and destitution. Thus landslide mitigation strategies which harmonize with the natural environment need to be implemented vigilantly in such landslide prone areas.

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