

# Incorporating the Hyogo Framework for Action into landslide disaster risk reduction in Malaysia

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**Abstract:** Landslides, including slope failures, are one of the significant natural disasters in Malaysia. Their frequency and impacts, such as injuries, loss of lives and damage to property, have been increasing over the years. However, current policy measures and response towards landslide risk reduction have not taken into account the full spectrum of the problem. This paper discusses the landslide disaster risk reduction (LDRR) scenario in Malaysia taking into account the priorities and action plans proposed in the Hyogo Framework for Action 2005-2015 (HFA). Issues related to landslide events, current practices and selected planning and management approaches that incorporate the HFA are highlighted.

**Keywords:** Hyogo Framework for Action, landslide, Malaysia

## INTRODUCTION

Landslides and floods are two major natural disasters that have impacted the country in terms of injuries, deaths, property damage, disruption and destruction of services, public inconvenience and economic as well as financial losses. While flood events are currently monitored and managed under a national framework for flood management, landslide events do not benefit from the same attention.

In Malaysia common occurrences of landslides are found in the form of slope failures at man-made slopes, particularly cut and fill slopes along highways, residential and urban areas. There have also been instances of large scale failures in natural terrains, such as rock falls at limestone hills, debris flows along valleys and slow-movement landslides in the mountain regions. Malaysia being one of the parties that have adopted the Hyogo Framework for Action 2005-2015(HFA), can take the opportunity to capitalise on the recommendations provided to substantially reduce losses due to disasters by strengthening measures and approaches in responding to landslide disasters.

## LANDSLIDES IN MALAYSIA

From 1900 to 2009, 611 lives were lost in 60 recorded landslides, though these numbers do not take into account unrecorded events, particularly between 1900 and 1990 (Table 1, Figure 1). Records from 1989 to 2009 show that there were 56 landslide events, of which 33 had fatalities, with 541 lives lost. On average, there were about 2.8 landslides per year, of which every year 1.7 landslides occurred with human casualty and property loss.

Catastrophic landslides in the period 1995 – 1999 were exceptionally high due to tropical storm Greg and

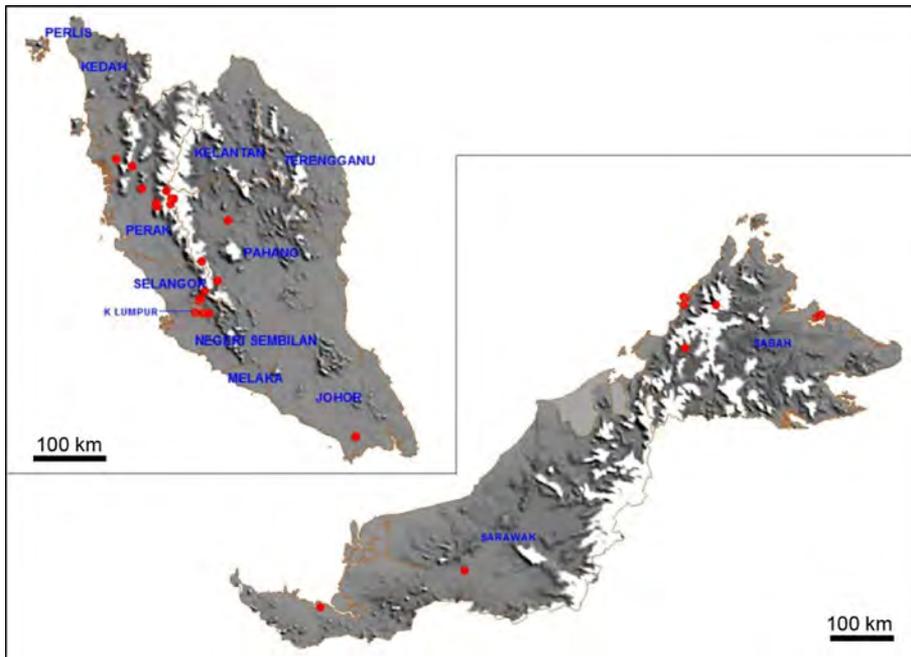
landslides at several locations in Sandakan, Sabah, debris flow in Genting Sempah, Pahang, and debris flood in Pos Dipang, Perak. During this period, a total of 411 people were killed, with 302 lives lost during the Greg storm. This particular disaster was a complex phenomenon, which had sequential secondary impacts that included widespread landslide and flooding events, resulting in many deaths and loss of property.

Landslides are the most significant geohazard which have triggered public interest, particularly when they occur in urban areas and cause damage to public property. Studies carried out at some hillside development areas have recorded

**Table 1:** Summary of the major landslide events in Malaysia, 1990-2009.

Year	Total Death	Total Landslide	Event with fatality
1900 - 1979	70	4	3 Perak: 3
1980 - 1984	n.d	n.d	n.d
1985 - 1989	2	1	1 Sabah: 1
1990 - 1994	53	7	3 Selangor: 2 Pahang: 1 Sabah: 5
1995 - 1999	109+302* =411	21	10 Pahang: 2 Perak: 2 Kuala Lumpur: 1 Selangor: 4 Sabah: 2
2000 - 2004	57	14	10 Perak: 1 Pahang: 1 Johor: 1 Sarawak: 1 Selangor: 4
2005 - Sept 2009	28	13	9 Sabah: 3 Pahang: 1 Sarawak: 1

\*--The Greg Tropical Storm in Keningau, Sabah; n.d – no data



**Figure 1:** Locations of major landslides in each state of Malaysia on shaded relief map.

a series of landslides in housing development areas, which are recurrences on previous landslide areas or man-made slopes with a history of previous failures (Komoo, 1997; Komoo & Lim, 2003). Most landslides occurred in granitic terrain, which has been recognised as being prone to landslides (Komoo, 1989; Chigira *et al.*, 2009).

Most landslides, particularly slope failures in urban areas, are not due to unfavourable geological conditions, but involve many other factors, which include issues related to unsuitable land use, poor slope design, lack of maintenance, and lack of public awareness on possible landslide occurrences. It is clear that a landslide disaster in itself is an issue that cannot be resolved by a single-discipline study or authority, but requires an integrated approach of various disciplines and practices in addition to cooperation of various stakeholders, be it government, private sector or the public. Planning, development and mitigating measures for disaster risk reduction necessitates a holistic approach and inclusivity of all parties, both stakeholders and beneficiaries.

### CURRENT PRACTICES OF LANDSLIDE DISASTER RISK REDUCTION

The Landslide Disaster Risk Reduction (LDRR) continuum can be subdivided into activities that relate to pre-disaster, during disaster and post-disaster stages. Current practice in managing landslide disasters generally focuses on activities during the landslide disaster and the post-disaster responses. In Malaysia, when a landslide occurs, a special Disaster Management and Relief Committee (DMRC) is set up and tasks assigned focus on Search and Rescue, Health and Medical Services, Media Coverage, Logistics Support, Security Control, Welfare and in cases of potential reoccurrence or secondary impacts, Warnings and Alert.

LDRR at the pre-disaster stage, such as planning and continuous improvement towards disaster prevention, mitigation, preparedness and vulnerability reduction, at present has not been given emphasis. Mitigation measures have been geared towards slope stabilisation, which require immediate response or action, due to the threat or risk imposed, not necessarily rehabilitation. There is a unit that has been established, i.e. the Slope Unit under the Public Work Department (PWD), but the tasks of the Unit are restricted to matters under the jurisdiction of PWD, i.e. highways and government properties. Their coverage is limited in slopes or areas prone to landslides in Local Authority areas and private sector development projects.

### HYOGO FRAMEWORK FOR ACTION

The Hyogo Framework for Action (HFA) is a key instrument to facilitate the implementation of disaster risk reduction measures. Adopted during the World Conference on Disaster Reduction held in Kobe, Hyogo, Japan in 2005 (UNISDR, 2005a), HFA provides strategies to build the resilience of nations and communities to disasters, with the goal of achieving substantive reduction of disaster losses by 2015. This is an overall framework for Disaster Risk Reduction (DRR), which can be tailored toward landslide disaster risk reduction.

The HFA offers five areas of priorities for action, guiding principles and practical means for achieving disaster resilience for vulnerable communities in the context of sustainable development. These priorities are as follows (UNISDR, 2005b):

- Make disaster risk reduction a priority – ensure that DRR is a national and local priority with a strong institutional basis for implementation;

- Know the risks and take action – identify, assess and monitor disaster risks and enhance early warning;
- Build understanding and awareness – use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- Reduce risk – reduce the underlying risk factors; and
- Be prepared and ready to act – strengthen disaster preparedness for effective response at all levels.

These priorities will be further discussed in connection with landslide disaster risk reduction in the context of the Malaysia.

### **HFA PRIORITIES FOR LANDSLIDE DISASTER RISK REDUCTION**

Malaysia's strong commitment to the HFA is demonstrated through its Ministerial Statements to the Global Platform for Disaster Risk Reduction held bi-annually in Geneva. The statement made by the Minister in the Prime Minister's Department at the Second Session of the Global Platform for Disaster Risk Reduction on 16-19 June 2009 clearly articulates this point: "Malaysia is committed to supporting the ongoing implementation of the Hyogo Framework for Action both at national and international levels". Malaysia also shows strong leadership in disaster risk reduction at the regional level. This was demonstrated when it hosted the Third Asian Ministerial Conference on Disaster Risk Reduction in 2008 that culminated in the Kuala Lumpur Ministerial Declaration that reaffirmed the HFA and called for specific regional responses (Pereira et al. 2009).

As noted earlier, the coordination for disaster management is led by the National Security Council of the Prime Minister's Department and executed through the Disaster Management and Relief Committee (DMRC) at Federal, State and district levels. Government agencies are responsible for different stages of execution while maintaining their fundamental functions. For example, the Malaysian Meteorological Department (MMD) provides information and warning on weather, sea condition, seismicity and tsunamis; the Department of Drainage and Irrigation (DID) monitors river flow, rain and flood as well as oversees flood mitigation; and the Social Welfare Department is in charge of relief and rehabilitation. In addition, a Special Malaysia Disaster Assistance and Rescue Team (SMART) is responsible for search and rescue operation in any disaster.

There are still several weaknesses in this coordination mechanism that need to be rectified, particularly in the context of landslides. These are analysed according to each HFA priority action.

#### **Priority 1: Making DRR a priority**

In terms of the development of policies and planning for handling landslide disasters, the following has been put in place:

- Hillside Areas Development Planning Guideline for Selangor 1997 – Town and Country Planning Department, Selangor;

- Hillside Areas Development Guideline 1997 – Department of Local Government;
- Environmentally Sensitive Areas for Malaysia in the National Physical Plan - Town and County Planning Department, Federal;
- Environmentally Sensitive Areas for Hills and Highlands for Selangor - Town and County Planning Department, Selangor; and
- Regulative measures as provided for in the National Land Code 1965, Geological Survey Act 1974, Environmental Quality Act 1974 and Local Government Act 1976.

What requires more attention is the development of a holistic governance system that encompasses measures that addresses landslides prior to, during, and post occurrences (threats and risks). There is a need to reconcile existing legal regimes, to determine gaps and to make available legal provisions that establishes clearer mandates, jurisdiction and measures of action. The system also should take into account landslide events on both man-made and natural slopes or areas, as well as address the various cycles of governance by multiple actors, from planning to disaster response.

#### **Priority 2: To update the system, know the risks and take action**

To do this there is need for a comprehensive information on the nature and potential of landslide events, which are at present being addressed by multiple actors and usually on an *ad hoc* basis. This is due to several constraints, such as priority setting by those governing, funding, manpower and capacity. That being said, steps have been put into place to address this, particularly in mapping landslide prone areas or events. These include the following:

- Department of Mineral and Geosciences (DMG) carrying out Geological Terrain Mapping throughout the country for mapping and assessing terrain including zonation of hazards for landuse planning.
- Public Work Department's study on National Slope Master Plan, which commenced in 2006 provides comprehensive documentation for slope management and disaster risk reduction for landslides (PMD, 2009); and
- The National Disaster Data Information Management System (NADDI) coordinated by the National Security Council with the National Remote Sensing Agency acting as a central repository for existing data.

In some cases, maps produced are often undertaken at the request of particular agencies or prepared upon the occurrence of a disaster. There is however, no single agency that is mandated and tasked with the planning of the technical aspects of DRR pertaining to landslides as a whole. This signals a need for an entity that can leverage on existing expertise, capabilities and capacities of DMG, PWD, MMD and MACRES, with a mandate to govern the full spectrum of actions arising out of landslide events and execution of DRR, thus cuts across traditional administrative jurisdiction and boundaries.

### Priority 3: Build understanding and awareness

Developing mechanisms to foster and inculcate understanding and awareness amongst the public has been the weakest aspect of DRR. The perception that Malaysia is generally free from natural disaster has set the mind of the general public that disaster is not an issue for consideration in the nation's development. There was very little public attention until the fatal collapse of the Highland Tower Condominium in 1991, the occurrence of the 2004 Tsunami and the current increasing number of landslide events that have claimed lives and damaged property.

The media have played a pivotal role in highlighting these disasters and probing the root causes. As a result, politicians and relevant authorities have had to respond accordingly. The greatest trigger to respond to DRR issues came after the 2004 Tsunami. A systematic approach for public awareness was initiated by the Academy of Sciences Malaysia, with technical support from the Institute for Environment and Development LESTARI, UKM (LESTARI, 2008). Subsequently, a more comprehensive study was funded by MMD with involvement of several universities and government agencies. In addition, the Ministry of Information, Communication and Culture created a Disaster Unit in the Department of Broadcasting Malaysia, to create public awareness of disasters (PMD, 2009)

With particular regard to landslides, a landmark project was carried out in Kundasang, Sabah. This involved the study of several large scale landslides which continuously threatened a local community. This multidisciplinary project, not only looked at engineering geology and hazard assessment, but also reviewed socio-economic impacts and governance for landslides. Several town-hall meetings, briefings to local authorities, and workshops conducted for the local communities created the awareness and interest by the local stakeholders.

However, in general in Malaysia, public understanding and awareness is relatively low and the response in terms of community decision making is unsatisfactory. One of the reasons contributing to this is the top-down approach in providing solutions where public participation in decision-making is generally ignored. Furthermore, high risk disaster areas are inhabited by poor or disadvantaged communities, with low awareness and education levels and limited capacity to respond. As such it is difficult to build resilience.

### Priority 4: Reduce risk

DRR issues have been incorporated in a limited number of land use planning mechanisms, e.g. the Department of Town and Country Planning (TCPD) Peninsular Malaysia has established the Land Use Planning Appraisal for Risk Areas (LUPAR) which requires all local authorities and developers to adhere to the Manual and the Planning Appraisal (PMD, 2009). The TCPD is working to incorporate environmentally sensitive areas in hillside development and land use planning for geohazard in their latest guidelines for planning development.

Currently, there are several developments in high risk areas, including housing estates, the most famous being Bukit Antarabangsa which has seen immense damage and considerable loss of lives (Komoo & Lim, 2003; Komoo *et al.*, 2009), and required mid- and long-term approach and solutions for DRR. The reactive and *ad hoc* mitigating measures put in place are high in cost with limited success. For such areas the only way to effectively reduce risk is by conducting comprehensive and detailed studies, which can be used as the basis for implementing mitigation measures and other DRR recommendations. In the meantime, high-risk areas that are designated for development should be reviewed with DRR being given top priority.

### Priority 5: Be prepared and ready to act

The Government of Malaysia has given considerable attention to disaster response. A Cabinet Committee directs relief operations through the National Security Council during a disaster which involves all the relevant agencies. A Special Malaysia Disaster Assistance and Rescue Team (SMART) was established and mobilized in 1993 in response to the Highland Tower landslide disaster. Since then, SMART has matured and can be mobilized for effective search and rescue when a disaster occurs.

In addition, mechanisms are already in place to rapidly set up emergency operations centres, including the appropriate infrastructure such as emergency communications and evacuation support system. A National Disaster Relief Fund has been established to provide financial assistance to those affected by disasters. The corporate sector and communities have responded positively by contributing an average of RM20 million (USD 5.7 million) annually to the Fund (PMD, 2009).

Effective as they are, these mechanisms are reactive in nature and do not address preparedness relative to long-term responses and in inculcating community participation. The way to overcome this weakness is to establish a national institution that is legally mandated to implement DRR measures that leverage on the entire national capacity and capability during a disaster and to formulate an HFA DRR Action Plan.

## RECOMMENDATIONS AND CONCLUDING REMARKS

The adoption of strategies in the Hyogo Framework for Action for landslide disaster risk reduction in Malaysia is beneficial and can only be achieved through proper analysis and understanding of the landslide scenario and prerequisites for a comprehensive governance system to manage natural disasters. While progress has been made towards incorporating LDRR into policy and planning of land use development and urbanization, there are several limitations which need to be addressed. The following are some of the key issues which require new initiative or further improvement.

**Establishment of an overarching government entity to oversee various aspects of landslide management.** A dedicated entity for landslide management, which is tasked to execute cross-cutting actions, from planning to mitigation measures is urgently required. This entity should leverage the existing expertise, capabilities and capacities of various agencies, as well as university expertise to develop policy and a strategic plan, and take actions to implement the full LDRR cycle, including R&D, technology and knowledge transfer and raising public understanding and awareness. The entity's strategic planning should include monitoring and developing indicators that would provide information on the status of progress of implementation of the HFA.

**Establishment of a national landslide database.** Currently, Malaysia does not have a comprehensive database on landslide events and related disasters. Even though there are some selected data compiled by researchers or individual agencies, there is no proper record and dedicated agency to monitor and maintain data on technical and socio-economic impacts of landslide. The landslide database is important to establish a hazard profile in any risk areas, which allows an early indication of future disasters. This information is also important for multi-hazard assessment, assessment of risk and vulnerability, public awareness and understanding, and high-level decision making process.

**Strategic Governance processes for landslide prone area.** When landslide prone areas have been identified there is a need for a comprehensive governance process that brings together the multifacets of landslide governance and translate them through a comprehensive set of measures that can include cross cutting legislative provisions incorporating rules and guidelines that will give better effect for DRR in that area. Such a comprehensive process should provide for both immediate and long term measures, to not only respond during an event, but to put into place procedures that will ensure proper management of the area, which includes long term control and mitigation measures for public safety, annual budget allocation to support activities and programmes related to LDRR. Emphasis should be given to empowering local and affected communities (including those with investments and vested interests in the area), focusing on including these communities into the governance process, so as to ensure decisions are made and responsibilities are shared collectively. Also, it is vital for them to be directly involved with the entire LDRR cycle.

In Malaysia, the risk from landslide disasters is low. Most disasters occur on man-made slopes and, therefore, the problem is preventable in most cases. Incorporating HFA recommendations in landslide hazard and disaster reduction will provide the basis for a long term solution.

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