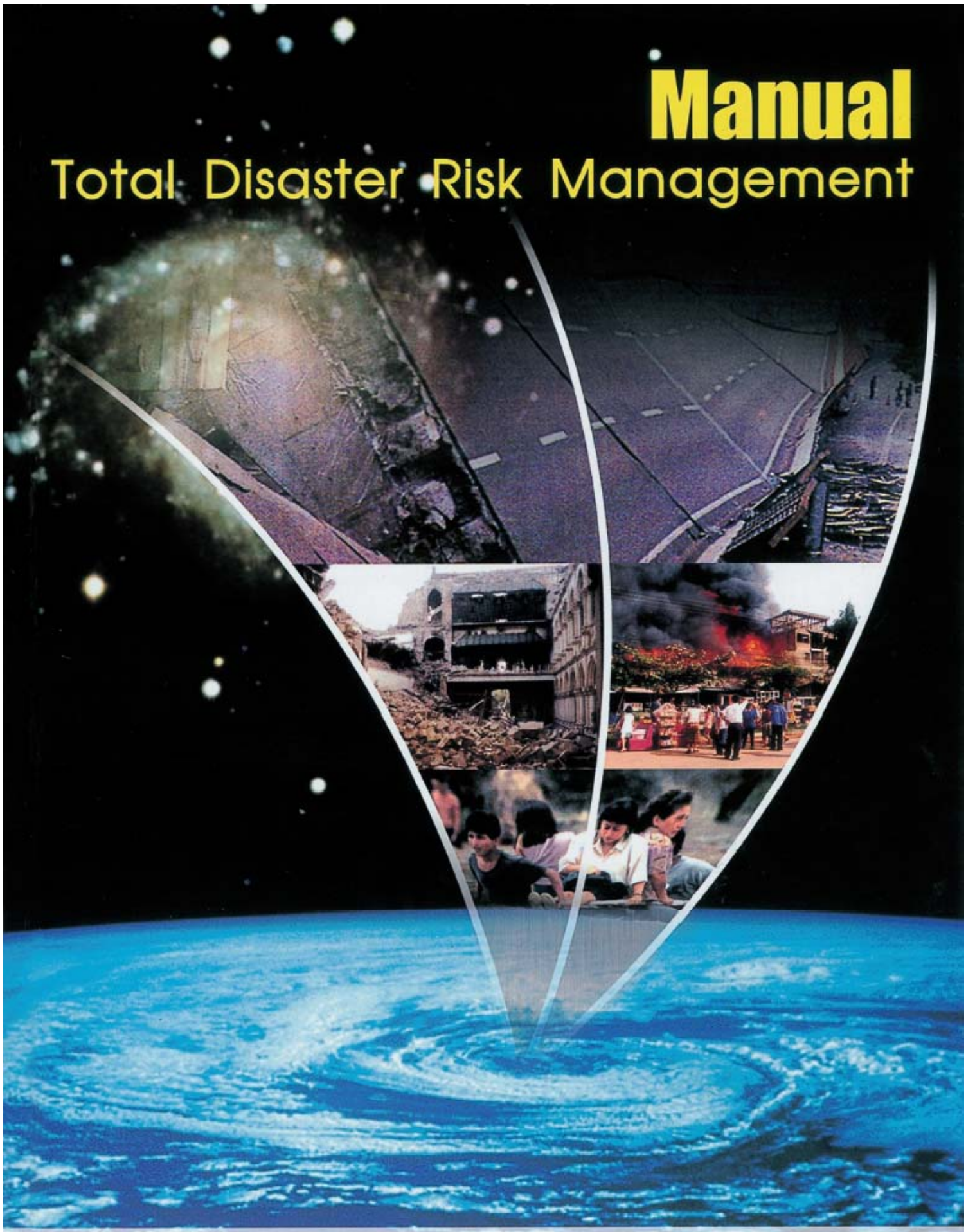
Manual

Total Disaster Risk Management



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Total Disaster Risk Management Handbook

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Executive Summary

Natural, technological and human hazards in Thailand have caused destruction in the past and will do so in the future. Diseases, weakened health care systems, catastrophic economic losses and civil disturbances often accompany disasters. Flooding in Thailand caused economic losses of over $15 billion baht from 1996 to 2000. Thailand is subject to many potential hazards, including flood, drought, fires, chemical spills, power outages and terrorism.

The Department of Disaster Prevention and Mitigation (DDPM) is a new department established by the Thailand government in October 2002. It was established to carry out all disaster-related responsibilities and activities, including prevention, mitigation response and recovery. The implementation of prevention and mitigation policies and procedures recognizes the need to take risk reduction actions before a disaster to reduce the need for response and recovery services following a disaster. This balanced approach, called Disaster Risk Management, strives to achieve disaster-resistant communities and a disaster-resistant nation.

Disaster Risk Management is an extension of the standard risk management concepts and methods businesses employ to support their financial solvency in the event of accidents or business disruptions. Disaster Risk Management applies these workplace concepts and methods to increase human survivability rates, restore services and normalize community, provincial and national activities in the event of a disaster.

Total Disaster Risk Management (TDRM) represents a paradigm shift from viewing disasters as only the consequences of extreme-hazard events to seeing them as being "manifestations of unresolved development problems". TDRM promotes sustainability by making the assessment and evaluation of risks and the implementation of risk-reduction solutions integral parts of the development process.

TDRM provides a methodology for the DDPM to use as it works toward its vision of a continually habitable and secure Thailand. The relationship between development and increased disaster risk is demonstrated by the dramatic rise in disaster losses concurrent with rapid development even when the rate of disaster events remains constant. The application of a Total Disaster Risk Management approach to development decisions is essential to reduce the soaring increase in vulnerability that accompanies uncontrolled development practice.

1.0 Introduction

1.1 Purpose

This handbook serves as a reference on Total Disaster Risk Management (TDRM) for senior and middle level officials attached to Thailand's Department of Disaster Prevention and Mitigation (DDPM). The DDPM provides an institutional and regulatory framework for the promotion of a national risk management culture. The handbook's central theme is the development and application of a system for managing any hazards that threaten the department's vision of a continually habitable and secure Thailand.

1.2 Consequences of Disaster

Developing countries suffer the greatest costs when disaster strikes. More than 95 percent of all deaths caused by disasters occur in developing countries; losses due to natural disasters are 20 times greater (as a percent of GDP) in developing countries than in industrialized countries.

Extreme-hazard events exploit weaknesses in the land, in the structures of buildings and in the ability to respond effectively to reduce suffering, leading to social, political and economic disaster. People already struggling to survive often live in poorly constructed buildings located in hazardous areas, such as flood plains, and often suffer from inadequate nutrition and poor health. A disaster further marginalizes these individuals, preventing their escape from poverty and, in most instances, plunging them into even more desperate situations. Children and the elderly experience disproportionately adverse effects at all levels of society.

Economic consequences, such as business failures and loss of government revenue, result in the "new" poor and migration of industries and businesses to other communities or even other countries; these consequences may decrease Thailand's ability to sustain a healthy national economy.

Disasters can also foment political instability and accusations, right or wrong, that the government was unprepared and provided insufficient assistance to victims.

Disaster touches everyone and recovery may take decades.

1.3 Definitions

Definitions of risk management tend to reflect the primary background of the speaker or writer in a discussion. Earth scientists often refer to the physical nature of the hazard. Planners may focus more on regional vulnerability, and insurance underwriters tend to focus on economic losses. The terms "risk" and "hazard" are sometimes used interchangeably. Selected keywords as used in this handbook are defined in recognition of this range of meanings:

Hazard

A hazard is the potential source of such consequences as human casualties, property damage, economic losses, social disruption, etc. Hazards are generally classified as natural (floods, landslides, subsidence), technological (communication system failures, power black-outs, server crashes) and human-caused (terrorism, cyber-attacks, traffic accidents).

Integrated Risk Management

Integrated risk management is a process implemented at all levels of an organization—department-wide (that is, in bureaus and centers) and at provincial/district and local levels. A Department Risk Officer or Risk Division may oversee and provide direction for the management of organizational risks. Integrated Risk Management also assumes that all personnel proactively identify and act to reduce risks.

Mitigation

Identify and document possible actions to diminish the anticipated level of consequences should a disaster occur, such as strengthening weak structures, improving emergency response plans and procedures, and installing drainage systems. Some actions address both prevention and mitigation, such as strengthening buildings to reduce the frequency of potential disaster and the consequences of disaster (Risk Management Program Standard, 1996; Essentials of Risk Management 1997).

Prevention

Identify and document possible actions to reduce the current likelihood that a disaster will occur (Risk Management Program Standard, 1996; Essentials of Risk Management 1997). For example, a fire prevention program to educate people on how to break the fire triangle (fuel, oxygen, ignition source) reduces the probability that a fire will occur, but does not reduce the severity of the damage once a fire starts. Possible disaster prevention actions include locating facilities outside of hazardous areas, maintaining drainage systems and strengthening weak structures.

Public Policies

Public policies express the principles that underlie the government's political philosophy. They form the framework for local, state and national legislation; resolutions; programs; appropriations; administrative practices, and/or court decisions. Public policies specify actions to be taken to resolve public issues.

Risk

Risk may be generally defined as the probability of negative consequences. Risk assessment looks at the relative probability that a hazardous event will occur, the elements and systems exposed to the hazard and the vulnerability of those elements and systems to damage. Risk may be reduced through the implementation of prevention and mitigation measures.

Risk management

Risk management is comprised of standard management tasks (planning, organizing, leading and monitoring) in combination with a decision-making process for identifying risk priorities and implementing risk reduction solutions. In the past, businesses used risk management processes primarily to estimate insurance coverage needs and to identify means of compliance with worker safety regulations. In recent years, risk management has involved increased emphasis on identifying and reducing a broader range of potential risks. Greater resources have been allocated to risk reduction in efforts to assure that post-disaster business, operational and financial objectives will be met.

Total Disaster Risk Management

Total Disaster Risk Management (TDRM) views disaster as the result of unresolved development problems. TDRM provides a balanced approach to reducing the consequences of disaster by addressing prevention, mitigation response and recovery services. Success is measured in terms of reducing human suffering and poverty.

1.4 Handbook Organization

The handbook is comprised of X chapters:

Executive Summary

Chapter 1 Introduction

Chapter 2 An overview of risk management concepts, including standards, elements that comprise a standard, risk management organizational structure, department-wide program integration and Total Disaster Risk Management

Chapter 3 Principles of Policy Formulation, Implementation and Maintenance

Chapter 4 Partnerships, Coalitions and Stakeholders

Chapter 5 Translating policy into prevention and mitigation action

Chapter 6 Risk Management Tools and Techniques

Chapter 7 Risk financing

Appendices

Appendix A Round Table Workgroup Results

Appendix B References

Key points are provided in a box at the end of each chapter.

1.5 Key Points

- ☐ The handbook is for use by senior and middle level officials attached to DDPM
- ☐ Total Disaster Risk Management represents a shift from a singular focus on post-disaster response and recovery to a balanced approach that includes pre-disaster prevention and mitigation efforts
- ☐ Total Disaster Risk Management views disaster as unresolved development issues

2.0 Risk Management

2.1 Introduction

Total Disaster Risk Management (TDRM) applies the risk management approach, which businesses use to manage the potential effects of accidents and business disruptions, to government disaster management programs. TDRM helps government agencies address and prepare for the potential effects of disaster on department operations and on national, provincial/district/local quality of life, and to plan for maintenance of economic stability and for reconstruction.

TDRM uses a risk management methodology comprising a management process and a decision-making process to guide the systematic and consistent assessment and evaluation of risks to the department's pre- and post-disaster goals and objectives. The methodology includes reviewing and prioritizing measures to control and to finance identified risks. Risks that have been assessed and evaluated but that cannot be reasonably managed or that are not considered to be priorities are classified as acceptable risks.

Risk management methodology identifies the potential consequences of probable hazard events on the social, economic and political health of a nation. The knowledge gained helps make disaster losses more predictable and enables the identification of appropriate actions to be implemented and maintained *before* a disaster occurs to ensure that people will be protected and that essential services will be sustained and recovery time reduced.

A national risk management program that implements pre-disaster measures to strengthen the nation against hazard effects reduces the number of resources needed to support post-disaster response and recovery. Populations in disaster areas are less likely to be displaced, to lose their means of making a living and to succumb to disease. TDRM helps produce a stable and secure society.

2.2 Risk Management Standard

Adoption of a risk management standard demonstrates that an organization has established an institutional mechanism to manage risk, has agreed upon risk reduction goals and objectives, uses commonly understood terminology and has adopted an agreed-upon process.

The standard also provides a baseline against which different organizations can assess program quality. The diversity of organizational needs and the variations in available resources require a flexible approach to the execution of the standard.

Organizations with limited resources may need to scale their programs and focus on risk management objectives based on existing data, limited analysis and the implementation of low-cost solutions. Organizations with greater resources may be able to hire consultants, conduct extensive scientific studies and implement and maintain a number of sophisticated

risk reduction solutions. These variations in resources among organizations can be accommodated within the risk management standard.

2.3 Elements of the Risk Management Standard

The standard addresses the two major elements of the risk management process: management and decision-making (Table 2.1 and Fig. 2.2).

2.3.1 Management Process

Elements of the management process include the four standard management functions of planning, organizing, leading, and monitoring and review (Table 2.1). These functions guide the department-wide risk management program and are also used to manage risk in programs and projects at all levels, including the individual tasks in the decision-making process (Table 2.1; Fig. 2.2).

A department Risk Officer or Risk Management Team typically has the responsibility for

- Managing the department-wide risk management program
- Chairing the Department Risk Management Committee, which is comprised of bureau and center representatives and relevant government agencies (e.g., Public Works) and whose tasks are to identify hazards capable of obstructing DDPM goals and objectives and to propose solutions for approval by high-level DDPM officials. Subcommittees, task forces and pilot projects may be created to support committee activities when additional technical ability is needed.
- Facilitating collaboration with Thai government agencies, non-governmental and private sector organizations and consultants necessary to carry out the DDPM mission
- Assessing department-wide risks, such as vulnerability of department facilities, workplace safety, purchase or lease of new department facilities, development and implementation of internal department emergency plans (for example, fire evacuation plan)
- Training and education of personnel in risk management procedures
- Compiling information on risks reported by department bureau and center managers, individual department personnel and consultants
- Summarizing and reporting risk information to senior management.

Bureau and center managers typically have responsibility for

- Managing risks to their programs, plans and projects
- Participating in the department's risk management committee
- Assessing and evaluating risks to their areas of responsibility
- Resolving risks as appropriate
- Reporting to the Risk Officer issues related to internal or external risk
- Communicating the importance of risk management to external program leaders, such as community officials
- Educating external program leaders on how to incorporate risk management into project development, implementation and maintenance.

All department personnel are responsible for proactively identifying and acting to reduce risk, such as improving the safety of their work space or notifying managers of risks that need to be addressed..

Figure 2.1 - Department-Wide Risk Management Organizational Structure

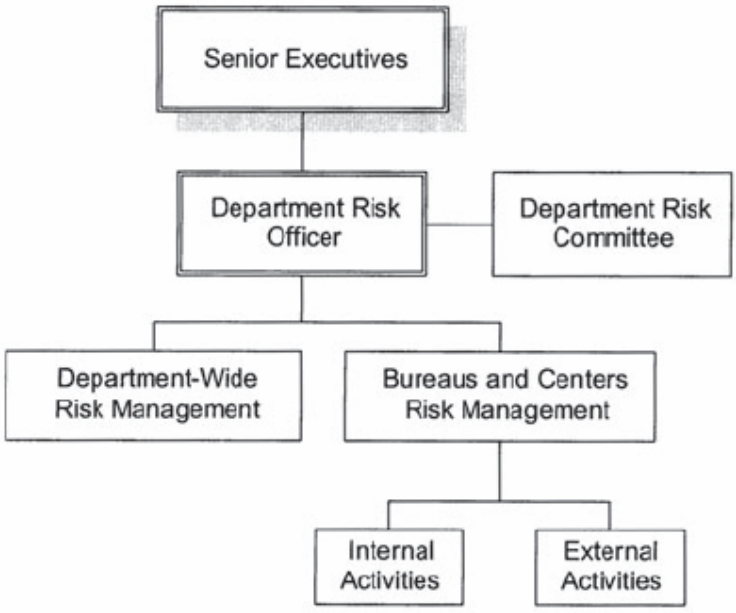


Figure 2.2 - Risk Management Decision-Making Process

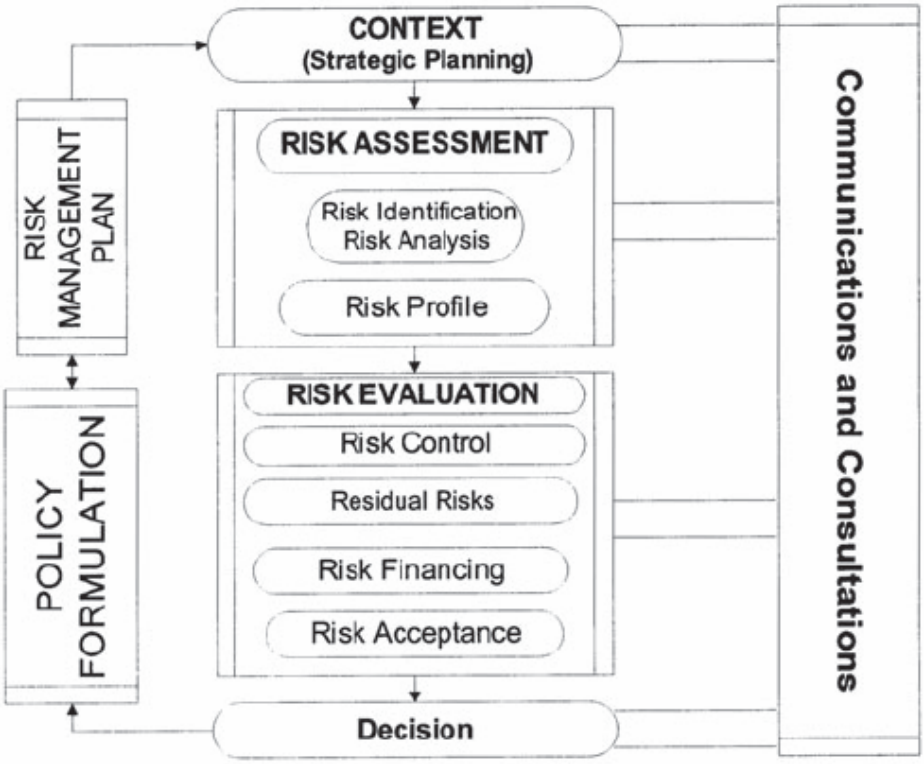


Table 2.1 Management Process

Management Tasks	Activities
Planning	• Obtain commitment and support from senior management • Plan, organize, lead and monitor the RM program • Ensure that all program management tasks are carried out • Establish schedule for updating RM information • Prepare estimates and budgets for cost of obtaining RM information • Prepare a blueprint outlining tasks, responsibilities, budgets • Chair the Department Risk Management Committee • Use department goals, objectives, and available resources to determine the types and format of RM information to be collected
Organizing	• Obtain authority to direct collection of desired information • Prepare data collection procedures and instructions • Information may focus on department-wide program (e.g., number of traffic accidents by department personnel), on bureaus and centers (e.g., priority areas of risk) or on communities (e.g., methods used to incorporate risk into projects)
Leading	• Meet with the managers, technical advisors, consultants, etc., whose departments, organizations or agencies will be responsible for collecting information • Discuss and concur on data collection methodology • Prepare data collection instructions • Follow up with those who will be doing the data collection
Monitoring and Review	• Monitor and review the management and decision-making process • Establish standards for data quality • Compare actual data collected against the standards • Correct and improve poor or incomplete data, as possible • Provide or arrange for specialized training to assist in data collection, such as interview techniques, mapping, GIS, etc. • Practice collection process (e.g., small pilot study) • According to established schedule, use defined risk reduction indicators to evaluate program success

2.3.2 Decision-Making Process

The decision-making team follows a systematic and consistent process to identify measures for mitigating the risks presented by hazards likely to obstruct the department's or a community's ability to achieve its goals and objectives. Decision-making is an on-going process that should be continually monitored and reviewed in order that changes in context, technical capabilities, understanding of the hazard, etc., can be addressed in a timely manner. The management functions shown in Table 2.1 are applied to each step in the decision-making process (Fig. 2.2) and described below.

Context, including political, social, financial and environmental issues, identifies the overall situation in which the decision-making process takes place. Actions successfully implemented in one community or at one level of government may be unsuccessful elsewhere. The context provides a basis for strategic planning.

Risk assessment defines the nature, location and extent of the hazard. The approach, study area, depth of assessment, need for cultural sensitivity, etc., in risk assessment will depend upon the context of the assessment. A national assessment may be carried out to identify high-risk communities that would benefit from being given a more detailed local assessment and from being assigned a high priority for future department projects and assistance.

Risk evaluation determines the significance of assessed risks, identifies actions for reducing risk to acceptable levels and prepares financially for residual risks that cannot feasibly be reduced. The determination of a hazard's significance will depend largely upon pre- and - post-disaster goals and objectives.

Decision- making assigns priorities to identified actions for reducing risks deemed significant.

The decision-making team communicates results to and consults with appropriate individuals or organizations (e.g., senior management, Department Risk Management Committee, bureau and center managers, community leaders, stakeholder groups, partners, and coalitions). Communication and consultation are essential to the development of effective risk management policies and plans. Results may be used to motivate those holding the authority to approve risk management programs.

Policy formulation and adoption provides an official framework for the risk management program.

A risk management plan sets forth the assumptions, legislation, procedures and practices that together implement the policy framework.

2.4 Integrating and Mainstreaming a Risk Management Program

A detailed study of international risk management practices prepared for the Canadian Government (KPMG, 1999) identified eleven practices commonly followed by organizations with leading risk management programs (Fig. 3). These practices provide a systematic approach to integrating and mainstreaming risk management throughout Thailand's Department of Disaster Prevention and Mitigation. These practices may apply inside the DDPM as well as to risk management programs established at the national, provincial, district and local levels. An integrated risk management approach assumes that an organizational risk management structure is in place and that all personnel are responsible for proactively assessing and acting upon risks.

Figure 3 Eleven Practices for Integrating and Mainstreaming Risk Management

1. Senior Management Commitment
2. Underlying Philosophy: Promote a Risk Culture
3. Organization Risk Function
4. Committees and Subcommittees
5. Common Risk Language
6. Open Communications
7. Communicating Risk Performance
8. Guidance
9. Training
10. Implementation Tools
11. Internal Audit

2.5 Total Disaster Risk Management

Total Disaster Risk Management (TDRM) represents a shift from viewing disaster as being the consequences of an extreme hazard event to being the results of unresolved development issues. Efforts to meet the needs of disaster victims through emergency response and recovery assistance have probably always taken place in some form. Emergency management programs developed over the past few decades focus on policies, plans and procedures to provide a rapid, structured response and to support recovery. More recent efforts focus on balancing the ability to respond to the consequences of disaster with pre-

disaster actions that lessen the need for response. The risk management methodology is ideally suited for developing this "Total" approach.

Villages, communities and cities have long been sited near natural features that sustain human life. Natural harbors support trade. River valleys, especially those enriched by sediment from periodic flooding or volcanic ash, are essential for farming. Terraced hillsides expand limited arable land areas to provide additional food sources. Coastal margins supply fish and other seafood. Even the shifting of the Earth can shape the land to form valleys for future communities. All of these localities are also associated with hazards that can lead to disaster by sweeping away or destroying the results of human habitation.

For centuries, disasters were viewed as being out of human control. Paintings of the 1631 eruption of Mount Vesuvius in Italy show cherubim in the clouds over the volcano, suggesting divine intervention. While hazards, such as earthquakes, are caused by natural forces beyond human control, their consequences are not. Actions can be taken to prevent or lessen the consequences of disaster through the implementation and maintenance of policies, plans and procedures that pertain to existing and new development.

2.6 Key Points

- ☐ Total Disaster Risk Management applies the risk management methodology used by businesses to manage accidental and business losses to the management of disaster losses
- ☐ Risk management is comprised of a management process and a decision-making process, providing a systematic and consistent assessment and evaluation of risks to pre- and post-disaster goals and objectives
- ☐ The elements of the management and decision-making process provide a standard for the risk management program
- ☐ Variations in the social, political, financial and environmental context in which the risk management program is developed, implemented and maintained will determine the extent to which each element in the standard is executed
- ☐ Integrating and mainstreaming risk management into an organization is based on developing a risk-management culture in which all department personnel are responsible for proactively identifying and acting on risk
- ☐ Total Disaster Risk Management views disaster as being the result of unresolved development practices

3.0 Principles of Policy Formulation, Implementation and Maintenance

3.1 Introduction

The policy, legal and institutional arrangements at the national and sub-national levels (provincial, district and local) together form the foundation for a community or society's approach to managing disaster risks. The corresponding frameworks formed by these arrangements must all be strong to prevent failure. The entire scope of the risk management process, including all management (Table 2.1) and decision making activities (Fig. 2.2), are incorporated into each framework.

3.2.1 Policy Framework

Policies themselves don't save lives or protect community resources, but their implementation and maintenance can. The political process arbitrates among diverse values and preferences by formulating public policies that attempt to resolve these differences. Policies reflect social values in action.

Differing ideas about how to prevent or mitigate the consequences of disasters are not necessarily either "right" or "wrong." Solutions to public issues are controversial by nature. Developed and developing countries, national and provincial governments, urban and rural communities all have different values and preferences due to different cultures and circumstances. Public policies reflect the concerns and differences of those involved in their formulation, implementation and maintenance. Knowing that there will be differences of opinion underscores the need for including during the formulation of a policy those who will be affected by its implementation.

The policy framework emergences from the risk management process as shown in Figure 2.2. As the figure indicates, policy formulation is part of a cyclical process that results in modified or new policies as changes occur in context, assessment, evaluation etc.

3.2.2 Institutional Framework

"The institutional framework is comprised of organizations or institutions, governmental and non-governmental, with a recognized role to play in hazards and risk management, and the mechanisms for coordination among organizations and institutions.

The term "institutional arrangements" incorporates the networks of entities and organizations involved in planning, supporting, and/or implementing disaster mitigation programs and practices. Institutional arrangements for disaster mitigation and management commonly include the establishment of a single entity at each level of government responsible for coordinating such activities and maintaining lines of communication and co-ordination among the involved entities and with stakeholders and communities. (Mattingly, 2002)"

3.2.3 Legal Arrangements

Legal arrangements - consisting of a framework of laws, executive orders, and other legal instruments - establish basic guidelines for governmental and non-governmental actions related to disaster risk management. The legal arrangements define authorities, responsibilities and roles of officials and organizations with respect to disaster risk management. Disaster risk management policies, practices, processes and collaborative relationships may be mandated or encouraged by the laws, executive orders, etc included in these arrangements (from Mattingly, 2002).

3.2 Thailand Policy, Institutional and Legal Framework

The DDPM and the ADPC have made it a priority to establish a TDRM approach to guiding the development and implementation of disaster prevention and mitigation programs in Thailand. Other organizations involved in making Thailand continually habitable and secure will be encouraged to apply a risk management approach for proactively evaluating the risk that disasters pose to their operations and for acting to reduce them. Overlapping and unclear lines of responsibility often occur among organizations seeking to achieve a healthy, sustainable nation and communities. The various and diverse needs of these organizations require a flexible risk management approach.

3.2.1 DDPM Policy Framework

The Thailand National Development Plan establishes the fundamental policy for prevention and mitigation programs. The incorporation of a TDRM approach into the national plan requires that the plan address prevention and mitigation policies and procedures as a routine part of all operations. DDPM policy seeks to integrate disaster prevention and mitigation actions into development practice. The promotion of a risk management culture at the national, provincial, district and community levels forms the underlying philosophy of DDPM disaster policies.

3.2.2 DDPM Institutional Framework

There are 20 ministries in the Thai Central Government: Office of the Prime Minister, Defense, Finance, Foreign Affairs, Tourism & Sports, Social Development & Human Security, Agriculture & Cooperatives, Transport, Natural Resources & Environment, Information & Communication Technology, Energy, Commerce, Interior, Justice, Labour, Culture, Science & Technology, Education, Industry, Public Health. Cabinet Council is the Central Management headed by the Prime Minister. DDPM is located in the Ministry of the Interior. Every Ministry reports to the Cabinet Council, which is headed by the Prime Minister. A number of independent agencies are assigned specialized tasks, such as the police agency.

The Ministry of the Interior is comprised of the Office of the Permanent Secretary, 6 departments, and 5 state enterprises. The 6 Ministry departments are: 1). Provincial Administration; 2). Community Development; 3). Lands; 4). Public Works and Town & Country Planning; 5). Local Administration; and 6). Disaster Prevention and Mitigation (DDPM).

The 5 state enterprises within the Ministry of the Interior include: 1) The Metropolitan Electricity Authority; 2) Provincial Electricity Authority; 3) The Metropolitan Waterworks Authority; 4) The Provincial Waterworks Authority; and 5) the Marketing Organization. Clearly these enterprises are also essential to developing national and community disaster resistance.

DDPM has five bureaus and centers that address policy, research on safety control measures, training and education, warning and coordination, and victim assistance.
Twelve disaster Prevention and Mitigation Regional Centers provide victim assistance and education and advice to government and private organizations and local communities. The DDPM also supports and provides a number of local-level prevention and mitigation activities, such as disaster prevention drills.

The important role in disaster management played by many Thai Ministries, departments, state agencies and local communities requires cross-organizational cooperation and participation. This task is facilitated by the DDPM.

DDPM provides guidance and assistance to help local communities develop disaster management plans and carry out emergency exercises. DDPM is also mandated to provide disaster assistance to victims following a disaster. Local communities can prepare their own prevention and mitigation plans, carry out exercises and provide relief for disaster victims without obtaining government approval.

The Department of Public Works and Town and Country Planning, which is also under the Ministry of Interior, is responsible for the development and implementation of building codes and land-use plans. Building codes and land-use plans are important prevention and mitigation measures for disaster risk reduction. Community building codes and land-use plans must be approved by the department. Cooperation between DDPM and the Department of Public Works and Town and Country Planning are an important part of reducing disaster risks in Thailand.

3.2.3 Legal Framework

DDPM was established pursuant to: Bureaucratic Administration Regulation Act B.E. 2545 (2002); Ministerial Restructuring Act, which have been in effect since October 3, B.E. 2545 (2002); Government Organization Establishment Royal Decree, which has been in effect since October 9, B.E. 2545 (2002); coupled with Bureaucratic Organization Division Ministerial Statute, Ministry of Interior B.E. 2545 (2002). This newly established Department has consolidated the following government agencies:

(1) Civil Defense Division, Department of Local Administration

(2) Office of National Safety Council of Thailand, Office of the Prime Minister

(3) Division of Disaster Victim Relief, Department of Social Welfares; Technical Assistance Center, Community Development Regional Centers 1 - 9, Department of Community Development; and

(4) Accelerated Rural Development Department

3.2.4 Community Disaster Prevention and Mitigation

The support, knowledge and disaster resistance practices provided by the DDPM through the department's bureaus, centers and the twelve Disaster Prevention and Mitigation Regional Centers at local levels require community involvement for their effectiveness. The community is the front fine of risk management in prevention and mitigation actions. Without community participation, proposed prevention and mitigation actions will likely not reflect local values, concerns, resources or culture, making implementation and maintenance difficult if not impossible.

Government asks for participation from community leaders and representatives to carry out a local risk reduction project. Ideally, community leaders will participate along with the Government to work toward community safety. The community leaders in some high risk communities may have less interest or fewer resources to support their participation. The Government will need to re-assess the importance of implementing a risk reduction program where implementation and maintenance may be difficult to achieve. There may be non-government agencies and private sector entities interested in assisting the Government with risk reduction activities.

There are some Thai community based programs initiated by communities themselves. For example, at the community named Bo-Poa, Nakorn Thai district in Phitsanulok province, where community encounters to flood and landslide, the community established a team to solve problems by themselves. The community leaders also requested government's support.

3.3 Identifying High-Risk Communities

A number of Thai government ministries and departments have responsibilities for identifying high risk communities. It is important for DDPM to work with these departments to identify communities that would benefit from DDPM programs and assistance. For example, DDPM had a landslide mitigation workshop with the Department of Geology and Mineral Resources, who does community based landslide risk management. DDPM should also work with other specialized agencies, such as the Irrigation Department, to facilitate a Total Disaster Risk Management approach.

DDPM research can identify high-risk communities, assign risk reduction priorities and deliver targeted services that make the best use of department funds. The highest-priority risks must address three key areas of community vulnerability: social, physical and economic (Table 3.1). Prevention and mitigation actions result in real changes in these three areas.

The concept of Community Based Disaster Risk Management (CBDRM) has recently been initiated in the Thai government. DDPM will identify high risk communities after running a national risk assessment and evaluating the significance of community risks to the ability of DDPM to meets its goals and objectives (Fig. 2.2). Established department criteria can be used to rank the importance of each high risk community and guide the selection and implementation of a CBDRM project(s). Communication and consultation at the national and local levels with respect to potential CBDRM projects will be continually repeated to ensure the definition and understanding of the criteria established to select and assign priorities to high risk communities.

This process ultimately leads to the formulation and implementation of policies that reflect the risk assessment, risk evaluation and communication and consultation necessary to identify a focus for the risk reduction program. For example, if all high risk communities face risks related to floods, then flood prevention and mitigation policies, plans and procedures may become the highest DDPM risk management priority.

Table 3.1 Highest priority risks address three areas of vulnerability

Vulnerability	Potential Affects
Social	• Loss of life • Injuries • Disruption of education programs • Disruption of health programs • Disruption of critical government services such as security and governance
Physical	• Loss of infrastructure such as power, water, sanitation or transportation systems • Housing • Critical facilities such as hospitals and health clinics, police and government buildings
Economic (to primary national and community income sources)	• Agriculture sector, both large agro producers AND small-holder farmers • Tourism sector • Fishing sector • Both large- and small-scale producers • Industrial sector

A community's vulnerability is directly related to its level and type of development. Communities with rapid, uncontrolled growth generate dramatic increases in vulnerability even when the frequency of hazardous events remains the same. When the next hazard occurs, the increased social, physical and economic vulnerability will result in much greater consequences than those experienced in the past. Consider the diverse situations in each of the following examples to identify how these characteristics affect potential consequences of disaster.

Example 1: Bangkok
Example 2: Pathumthani
Example 3: Fishing village on the southeastern coast of Thailand
Example 4: Rice farming village

The level of risk is determined relative to the person, community, nation, etc., that "owns" the risk. The risk for a person crossing the street at an intersection differs from the risk for a driver passing through the intersection. Similarly, the level of disaster risk "owned" by the population of a small community differs from the level of disaster risk for the population in a major city, like Bangkok. A person living in the small community may consider the local risk as potentially disastrous. On a national level, that local risk may not be viewed as a potential national disaster. The type of assistance and resources provided to reduce risk will depend on the level of risk, who owns the risk and who owns the resources.

The impact of a disaster on many small agricultural communities over a broad area may have significant effects on the nation's food production, may result in the displacement of populations to already crowded cities and may generate other consequences of national importance. Therefore, from a national perspective, the aggregated risks to agricultural and associated food production may be unacceptably high.

The importance of Bangkok to the country's overall social, political and economic well-being makes the management of city risks of high national concern.

3.4 Components of Successful Vulnerability Reduction

Successful policy, legislation and institutional arrangements comprise the three primary components of vulnerability reduction. These must be based on consensus and consultation, right down to the community level and back. This cyclical approach is referred to as End, to End, to End (Fig. 3.2). This same cyclical approach applies to the development of successful policy, legislation and institutional arrangements at the national level among related Ministries and departments (Fig. 3.3).

Figure 3.2 Cyclical approaches to vulnerability reduction at the community level

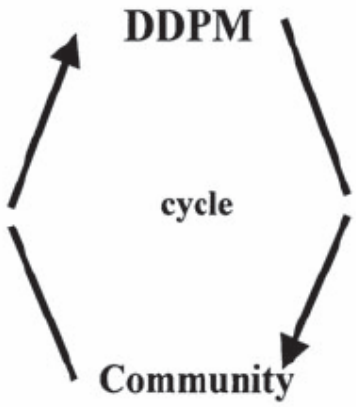


Figure 3.3 Cyclical approaches to vulnerability reduction at the National level

3.5 Policy Implementation

Risk management policies at all government levels take a long time to be put into practice. Implementation must be viewed as a long term effort that may take decades to demonstrate results.

Example 1: California started its Earthquake Risk Management Program 75 years ago

Example 2: Hurricane Andrew hit South Florida in 1992. As a result, it was decided that major changes must be made to the Florida Building Code. These changes were just enacted in 2002 – a full decade later

3.6 Assessment of Policy Effectiveness

Determining the effectiveness of a risk management policy requires assessing the policy's feasibility, the implementation context, an evaluation of cost and an estimation of application effects. Formulation of policy is necessary, but it is not sufficient to establish a risk management framework.

3.6.1. Policy Feasibility

Are resources available to formulate policy (technical, financial, legal)?
What mechanisms are available to implement?
How likely is compliance?
How difficult is monitoring likely to be?

3.6.2 Implementation Context

Nature of the hazard (localized, regional)
Intensity of development interests in hazardous areas
Population, business and industrial growth rate
Availability of alternate development sites
Technical considerations

3.6.3 Cost Evaluation

Adoption
Implementation
Monitoring

3.6.4. Application Effects

Percentage of area at risk "covered" by the policy (national, provincial, district, community, neighborhood)
Estimated impact if policy is fully implemented
Potential implementation success

3.7 Example of Actions to Establish Measures of Success

This example outlines steps that could be taken to establish measures of success for the reduction of social vulnerability. A wide range of issues might be addressed, depending on the concerns of those who would be directly affected. Methods for measuring success should be established at the beginning of a risk management program in order to best determine, later, if actions taken have achieved desired results. Setting goals, objectives and measures of success are part of the planning process.

Goal:	Improve health and welfare of the poor following a disaster
Objective	Strengthen the capacity to deliver pre and post-disaster public-health services
Measure of Success – 1	Improve Health Indices for poor population by 20% in 5 years
Measure of Success – 2	Increase number of health clinics built in non-hazardous areas by 50% within 10 years

3.8 Key Points

- ☐ Policies themselves don't save lives or protect community resources, but their implementation and maintenance can
- ☐ Policies reflect the concerns and differences of those involved in policy formulation, implementation and maintenance
- ☐ The DDPM provides an institutional framework within which risk management policy can be formulated
- ☐ The community is the front fine of risk management in prevention and mitigation actions at the local level
- ☐ Prevention and mitigation actions result in real changes in three high-priority areas of vulnerability: social, physical and economic
- ☐ Vulnerability is directly related to a community's level and type of development
- ☐ Risk management policies at all government levels take a long time to put into practice. Implementation may take years or even decades
- ☐ Determination of policy effectiveness requires ongoing monitoring and review of the policy's feasibility, implementation and context, as well as an evaluation of cost and an estimation of application effects
- ☐ Successful risk management policy takes into consideration the cultural practices, social values, ethics and local knowledge were appropriate

4.0 Partners, Coalitions and Stakeholders

4.1 Introduction

Many kinds of relationships are formed in the furtherance of disaster prevention and mitigation plans. These relationships may last for a limited period of time to address an immediate, specific concern, or they may continue over many years. Relationships provide an opportunity to share personnel, expertise and funding to maximize often limited resources. Knowledge and advice are frequently disseminated through capacity-building activities enabled by established relationships. The relationships discussed in this handbook include collaborations, partners, coalitions and stakeholders. A brief description is provided for each of these relationships.

Collaborations	On-going, working relationships with other organizations that have key roles in the prevention and mitigation of disasters.
Partners	People or organizations associated with others in some common activity; could mean a partnership between two cities or countries
Coalition	An alliance or union, especially a temporary one
Stakeholders	All those having a share or vested interest in an enterprise

Policy should support the establishment and maintenance of these relationships at all government levels to most effectively further disaster prevention and mitigation goals and objectives. Partnerships, coalitions and stakeholder groups may be formed at each of the following levels of government, depending on the specific issues to be addressed:

International
National
Sub-national
Provincial
Community

Partners, coalitions or stakeholders may be required to identify, implement and maintain a variety of risk reduction actions. Table 4.1 lists key organizations at different government levels that may foster DDPM programs.

4.2 Examples

4.2.1. Collaborations

DDPM can facilitate collaborations with other Thai Ministries and Departments that have responsibilities related to disaster prevention and mitigation. Such collaborations can take the form of round table discussions among agency managers, workshops to exchange

information on inter-related activities (e.g. irrigation, meteorology, mineral resources) and inclusion of government representatives on the DDPM Risk Committee.

DDPM can also act as a bridge between NGOs like the Red Cross and local governments to enhance capacity at the subnational level.

4.2.2. Partnerships

DDPM can establish partnerships with private sector organizations to enhance local capacity. For example, emergency medical response (EMS) in the city of Bangkok is severely impeded by traffic congestion. A partnership with local taxis drivers to provide this service would greatly expand EMS capacity. DDPM could act as a bridge between the health care community and the taxi cab drivers. Discussions with the health care community to explore this approach and to discuss logistics could be used to prepare a enhanced patient transport plan. For their participation, taxi drivers could receive first aid training, basic first aid supplies and equipment and a map showing local health care facilities. Taxi cab radios may provide enhanced communications during emergencies.

DDPM could explore the possibility of establishing an international relationship partnership between Thai and Singapore fire fighting agencies. This even be accomplished through a "Sister City" arrangement between Bangkok and Singapore brokered by DDPM .

4.2.3. Coalitions

DDPM could help establish a coalition among adjoining South East Asia countries to explore a regional approach to promote disaster resistant development. This coalition could address cross border concerns, such as multi-country flooding.

4.2.4. Stakeholders

This is a broad category that can include all those affected by a disaster within a community – everybody – or a select number of individuals and organizations responsible for specific functions. For example, the community may want to focus prevention and mitigation activities on enhancing fire fighting capabilities. Stakeholders may include local fire fighters (professional or volunteer), water department representatives and transportation managers. This would be a more focused group of stakeholders. DDPM could directly facilitate stakeholder relationships through the Community Based Development program.

Table 4.1	Potential partner, coalition and stakeholder organizations
Government Level	**Organizations**
International	• UN-ISDR – Geneva and Asia meetings • IFRC – Headquarters, Geneva • IFRC – Regional Office, Bangkok • International donor community • International NGO community • MSR, CARE, OXFAM, World Vision
International; Asia-based	• ADPC – Bangkok • RCC • ADRC – Japan
Asian	• ASIAN Disaster Management Program • ASIAN Senior Officials of Environment (Haze and Forest Fire) • ASIAN Regional Forum (ARF) – Intercessional Meetings on Disaster Relief
Southeast Asia	• Mekong River Commission (MRC) – Flood Management and Mitigation Program • ESCAP-WMO – Typhoon Committee Tropical Cyclone Panel
Neighboring Countries	• Laos, Cambodia, Vietnam, Malaysia, Singapore, Myanmar • Direct the DDPM to NDMO • Policy, program and capacity comparisons • Mutual assistance agreements • MOU's for Emergency Service Inventory Sharing • Hydro-meteorological cooperation • Geo-Technical Cooperation
National	Special working groups, such as • Hazard mapping, risk mapping, risk assessment, early warning programs • Awareness raising, social marketing, media by sector, hazard, location, community, social group
Sub-national	National policy should not limit but should encourage development of local policy in special provinces and in Bangkok (Thailand's only mega-city) and ministries
Provincial	• Special provincial committees headed by governors (consider special link to Red Cross by governors) • All provincial departments (internal/external) • Schools (K-12), colleges and universities • CBO's: Chambers of Commerce, business and social organizations • Local and national NGO's • Thai Red Cross • Districts

Table 4.1	Potential partner, coalition and stakeholder organizations
Government Level	**Organizations**
	• Municipalities
Community	• Users/public/stakeholders • Apply End, to End, to End consensus and consultation • All community members across: –Age groups –Workers (farm, tourism, fishing, factory, business) –Towns –Villages –Neighborhoods (Mubahn) –Family units
Special multi-level groups	• Colleges and universities • Media • Private sector

4.3 Getting Started

Yet by following an established risk management process to identify and assign priorities to risks considered most significant by the DDPM, the first steps will be taken in the –1,000-mile journey. As soon as those risks are identified, partnerships, coalitions and stakeholders can help to find, implement and maintain prevention and mitigation measures that lead to desired results.

4.4 Key Points

- ☐ Relationships provide an opportunity to share personnel, expertise and funding to maximize often limited resources
- ☐ Partners: Persons or organizations working together in some common activity; partnerships can be between two cities or two countries
- ☐ Coalition: An alliance or union, especially a temporary one
- ☐ Stakeholders:All those with a share or vested interest in an enterprise
- ☐ Policy should support establishment and maintenance of these relationships at all government levels

5.0 Translating Policy into Action

5.1 Introduction

This chapter focuses on the formulation, implementation and maintenance of the risk management process described in Chapters 2, 3 and 4— that is, on putting specific prevention and mitigation policies and actions into practice. The process described in Chapters 2, 3 and 4 is based on the premise that disasters are the direct result of unresolved development problems, including:

- Increased concentration of population in hazardous areas
- Increased vulnerability of the built environment due to shoddy and/or illegal construction
- Increased fragility of socioeconomic systems due to inappropriate development practices and/or environmental mismanagement
- Unprepared populations and institutions
- Population destitution and social injustice

These interrelated problems combine to create an increasing trend toward societal susceptibility and diminishing societal resilience.

5.2 Barriers to Disaster Risk Reduction

Past efforts have focused on post-disaster response rather than on pre-disaster prevention and mitigation actions designed to improve community resistance to extreme-hazard events. This lack of attention to pre-disaster prevention and mitigation is demonstrated by poor construction standards and laxity in professional ethics, which are the principal vulnerability factors in developing countries. These vulnerabilities are increased by inefficient use of resources and poor education. Overcoming these barriers will require more transparency in the policy-making process and the involvement of civil society in the process. As noted at several points in this document, the successful formulation, implementation and maintenance of risk management policy require participation by those who will be directly affected.

5.3 Identification of Risk Reduction Actions

The identification of risk reduction actions and the mechanisms for putting them into practice are addressed in the disaster risk management approach. These actions include the broad scope of pre- and post-disaster measures. This general process can be summarized as "Assess, Discuss, Plan, Implement and Review and Repeat (EMI)" The following steps outline this process.

5.2.1 Establish Program Management

Initial government, institutional and social interest in risk management may be limited. Gaining commitment often requires making multiple presentations to those in authority and providing information on past disasters to generate interest and concern. Authorities include high-level officials, department managers, community leaders and others. The DDPM, the ADPC and other institutions often lead the effort to stimulate action. This process is generally repeated again and again.

Initiating the risk management program at any government level after arousing concern among those in authority involves establishing a management process to guide the risk management program. The program manager may be the department Risk Officer, a bureau or center manager, a local community leader or a consultant. The Program Manager may chair a risk management committee (department, provincial/district or local level), provide a single point of contact, establish meeting schedules, coordinate risk management activities and distribute information to participants in the risk management process.

Initial management activities may include a kick-off meeting to brainstorm issues of concern. This kick-off effort confirms the management process and sets preliminary goals and objectives to drive the decision-making process.

5.2.2 Complete the Risk Management Decision-Making Process

As the understanding of risks and their significance increases among organizations involved in the program, clearer and more compelling information emerges — information that can be used to further promote the management of risks as the decision-making process unfolds.

The first step in the decision-making process is to identify the context within which the risk management program will be carried out. Social, cultural, economic, political and institutional factors will drive discussions about which concerns will be addressed, the way in which risks will be assessed and evaluated, the significance of risks to the community or the nation and the kinds of solutions to be considered. Elements to consider in identifying and understanding the context include, but are not limited to:

- Legal and institutional arrangements
- Governance and management arrangements
- Building codes
- Land-use practices
- Key stakeholders
- Partners and/or coalitions
- Demographic parameters
- Socioeconomic conditions

- Financial protection instruments
- Religion

5.2.3 Assess, Discuss, Plan, Implement and Review and Repeat

The four cornerstones of disaster risk reduction include the development of sound policy and a legal framework, a process for implementation, a culture of prevention and mitigation and action plans for disaster reduction. The decision-making process (Fig. 2.2) shows steps to take in identifying and assigning priorities to risk reduction actions and in formulating policy that leads to a risk management plan. The management process addresses steps to take toward achieving a culture of prevention and mitigation and toward integrating that culture throughout the organization. The DDPM facilitates this integration at the national and sub-national (provincial, district and local) levels and in non-government organizations. Integration of disaster management also needs to take place within each local government office in coordination with the central authority. Partners, coalitions and stakeholder groups, including private sector organizations, can assist with integration at all levels of government.

As noted earlier (Fig. 2.2), the decision-making process is iterative; it involves the need for ongoing communication and consultation among and between authorities and all those who would be directly affected by potential disasters. The entire decision-making process is continually monitored (document steps, develop assessment parameters) and reviewed (constantly reiterate).

5.4 Example Risk Reduction Actions

The ultimate result of the risk management process is the identification, implementation and maintenance of risk reduction actions. The DDPM is responsible for developing all aspects of preparedness, mitigation, response and recovery. Planning for these actions will need to be sensitive to the context within which they were identified if implementation is to be successful. The DDPM has varying degrees of authority for enforcing implementation of risk reduction actions, but has extensive responsibility for providing pre- and post-disaster assistance at national and sub-national government levels and to non-government organizations. Action items that may emerge through the decision-making process include those shown in Table 5.1.

Table 5.1 Potential Action Plan Items to Include in the Risk Management Plan

5.4.1 Preparedness Action Plan Items

Scenario analysis
Mobilization/contingency plans
Early Warning Systems
Training
Community preparedness
Organizational analysis
Disaster legislation
Risk prioritization
Locations for shelters
Identify hazardous sites
Identify critical networks

5.4.2 Disaster Mitigation Action Plan Items

Mitigation prioritization
Value-added analysis
Communications Planning
Building code regulations
Land-use planning
Urban renovation
Mitigation incentives
Risk transfer and insurance
Training

5.4.3 Disaster Response Action Plan Items

Real-time damage estimation
Disaster resource allocation
Resources deployment
Emergency communication
Disaster monitoring
Communication protocols
Health care delivery
Urban search and rescue

5.4.4 Disaster Recovery Action Plan Items

Housing and reconstruction
Infrastructure repair
Funding and capital allocation
Organizational recovery
Health care delivery
Victim needs assessment

5.5 Key Points

- ☐ Lack of attention to pre-disaster prevention and mitigation is demonstrated by poor construction standards and laxity in professional ethics
- ☐ Vulnerability is increased by inefficient use of resources and poor education
- ☐ Disaster risk management provides a methodology for identifying, implementing and maintaining risk reduction actions
- ☐ The key parts of the risk management process can be summarized as "Assess, Discuss, Plan, Implement and Review and Repeat"
- ☐ Success depends on continued consultation and communication among all stakeholders

6.0 Risk Management Tools and Techniques

6.1 Introduction

Risk is an integral part of life. Risk management provides a methodology to achieve goals and objectives by proactively identifying and acting to manage risks capable of interfering with success. Different goals and objectives correspond to different perspectives on what makes up risk. These different perspectives and the context within which risk is resolved influence the selection, implementation and maintenance of risk treatments.

Risk treatment methods are generally classified into two broad categories: risk control tools and techniques and risk financing measures. These two highly interrelated categories encompass actions to, respectively, manage the affects of risk on the organization and to "anticipate and pay for losses that could occur" (XXX; Chapter 7).

Risk control efforts involve three basic techniques: avoidance, prevention and loss reduction (including mitigation, preparedness, separation and duplication). A description of each of these techniques provides a starting point for identifying effective risk control actions. It is important to recognize that actions to control one risk may inadvertently create a new one. Similarly, trying to avoid one risk may result in missing new opportunities. Risk control actions need to be considered against a broad range of issues and concerns to best evaluate the significance of the risk to the community or the department.

6.2 Risk Treatments

6.2.1 Risk avoidance – not taking on a potential risk or eliminating an existing risk

Actions

- Locate buildings outside of areas with a potential for floods, landslides or subsidence
- Tear down hazardous buildings and clean up sites
- Pay home and/or business owners in hazardous zones to relocate
- Trade property in hazardous areas for property outside of hazardous area
- Provide subsidized, low-income housing outside of hazardous areas

Challenges

- Relocating structures outside of flood zones may result in building on unstable slopes, especially where limited land is available for construction
- Abandoning buildings may result in unacceptable housing shortages
- Resettling populations from landslide areas to free government land in a non-hazardous zone may conflict with the cultural importance of hereditary land ownership, resulting in lack of compliance
- Moving small businesses to locations above potential flood waters may impact daily access by potential customers and disrupt the continuity of the downtown area

Benefits

- Undeveloped or reclaimed flood plain can provide needed agricultural land
- Wetlands necessary to maintain clean water may be preserved
- Reduction of fatalities, injuries and damage to property
- Reduction in humanitarian relief needs

6.2.2 Prevention – prevent or reduce the likelihood of a disaster occurring

Natural hazards like weather events, earthquakes, volcanoes and many landslide events cannot be prevented. The likelihood that associated affects will result in a disaster, such as severe flooding resulting from a tropical storm, can be prevented or reduced in a number of ways.

Actions

- Maintain a clear drainage system
- Install dikes and other water detention or diversion systems
- Provide training and education on appropriate maintenance procedures to facilities and utility personnel
- Provide workshops to geotechnical and structural engineers on building practices for hazardous areas, such as not destabilizing a slope by cutting off the "toe" during construction
- Establish and enforce building codes
- Prevent the accumulation of water at the top of steep slope
- Plant vegetation that helps stabilize slopes
- Provide model construction plans
- Regulate the extraction of water to prevent subsidence, such as limiting the amount that can be removed, placement and size of pipes
- Where subsidence is due to the accumulation of deep layers of silt, dredge or install retention ponds

Challenges

- Drainage system substandard and resources not available to upgrade
- Lack of engineers capable of carrying out prevention actions
- Sources of water may be limited and result in excessive withdrawals

Benefits

- Improved water system, including drainage, pipelines and treatment, will enhance health before and after a disaster
- Prevention of subsidence will reduce or prevent damage to structures related to vertical displacement

6.2.3 Loss Reduction – reduce the severity of a disaster after it has occurred

There are several common loss reduction measures: catastrophe or contingency planning (preparedness), engineering solutions (mitigation), separation and duplication.

Actions

- Establish an emergency management program that defines how the organization will organize to manage a disaster, define roles and responsibilities, summarize risks, list planning assumptions and prepare standard operating procedures
- Separate and maintain fire fighting resources throughout the community to enhance response capability and to facilitate a quick response to control a potential conflagration
- Maintain parallel operations of essential community infrastructure, such as two power substations providing service to a single community
- Store back-up supplies and equipment
- Build elevated structures
- Construct strong roof to wall connections and use wind resistant roofing materials
- Construct distributed community centers, health care facilities
- Build engineered structures

Challenges

- Lack of planning expertise
- Need for enhanced training for engineers
- Need research to determine appropriate building practice that address both the hazard and local building practice
- Lack of available materials

Benefits

- Disaster plan should provide a structure to manage lesser emergencies that can escalate into a disaster
- New construction improves housing conditions for population

6.3 Key Points

- ☐ Risk can never be completely eliminated
- ☐ Risk treatments reflect the requirements of the individual or organization who has defined and wants to manage their risk
- ☐ Risk control tools and techniques refer to the broad category of actions that together manage risk, including avoidance, prevention and loss reduction (preparedness, mitigation, separation and duplication)
- ☐ Avoidance involves not taking on a particular risk, such as avoiding flood hazards; care must be taken that avoiding one risk does not result in another more dangerous risk being created
- ☐ Prevention includes actions to prevent or reduce the likelihood that a disaster will occur
- ☐ Loss reduction includes several approaches to reduce the severity of a disaster once it has already occurred;

7.0 Risk Financing

7.1 Introduction

Risk financing is the ability to provide funding in appropriate amounts and at appropriate times to cover accidental and business losses. Businesses include risk financing as one part of a comprehensive risk management program focused on maintaining business solvency. The primary focus of most business risk financing programs has been on assessing the level of insurance coverage needed to provide funds to restore operations following a likely emergency event.

Disaster risk management models estimate losses caused by catastrophic events. Early models focused on estimating potential damage to the infrastructure. These results were used to develop engineering strategies to reduce potential damage and associated risks. More recent disaster risk management models estimate financial losses associated with catastrophic events (Haresh Shah and Weimin Dong. 2004). These advances in catastrophic loss modeling open the way to balancing engineering actions for reducing catastrophic risk with financial mechanisms for managing risks.

7.2 Importance of Risk Financing

The importance of adopting mechanisms for managing financial risk becomes apparent through the observation of data collected over many decades, which indicate that:

1. Economic losses are increasing with time
2. Developed countries have made progress in reducing fatalities but not in reducing economic losses
3. Developing countries have not made any progress in reducing fatalities or economic losses

These observations lead to an understanding of the urgent need for developing countries to address the financial effects of disaster at the national, sub-national (provincial, district and local) and non-government levels. Disaster disproportionately affects developing countries, which lack the financial resources for managing the economic impact on their societies. Post-disaster-assistance loans provided by organizations like the World Bank may cover some emergency response and recovery expenses. Loans, however, place yet another financial burden on the country. Catastrophic losses could prevent the achievement of a continually habitable Thailand and a secure society.

7.3 Benefits of Risk Financing

Catastrophe insurance reduces the financial risk to the insured by spreading the risk to all those who pay insurance premiums against the specific risk. The premiums paid by those not affected by the catastrophe contribute to the availability of risk financing for insured disaster victims. This risk is further spread when reinsurance is purchased by the insurance company to cover losses in excess of the company's ability to pay. The reinsurance companies can then sell bonds to investors to further spread the risks globally.

The percent of the population purchasing catastrophe insurance, called penetration, reflects the extent over which the risk is spread. The very low penetration, shown for developing countries emphasizes the financial risk to which these countries are exposed:

- India – under 0.5%
- the Philippines – under 0.3%
- Iran – under 0.05%
- Romania – under 5%
- Bulgaria – under 3%
- China – under 0.5%
- Turkey – 17%

Reinsurance provides an umbrella to shield the purchaser from being financially crippled by a disaster and facing decades of recovery efforts. Recovery might never be achievable after an extreme disaster or the onslaught of multiple disaster events.

7.4 Figures

Figures A1 through A4 in Annex A show data used to support the importance of obtaining catastrophe insurance to manage disaster risks in developing countries

7.5 Key Points

- ☐ Disaster Risk financing is the ability to provide funding in appropriate amounts and at appropriate times to cover catastrophic losses
- ☐ Developing countries have not made any progress in reducing economic losses
- ☐ Catastrophe insurance reduces the financial risk to the insured
- ☐ National catastrophe insurance prevents developing countries from economic disaster

Annex to Chapter 7 (Risk Financing)

Figure A1 Insured vs. Total Economic Loss in Major Natural Catastrophes

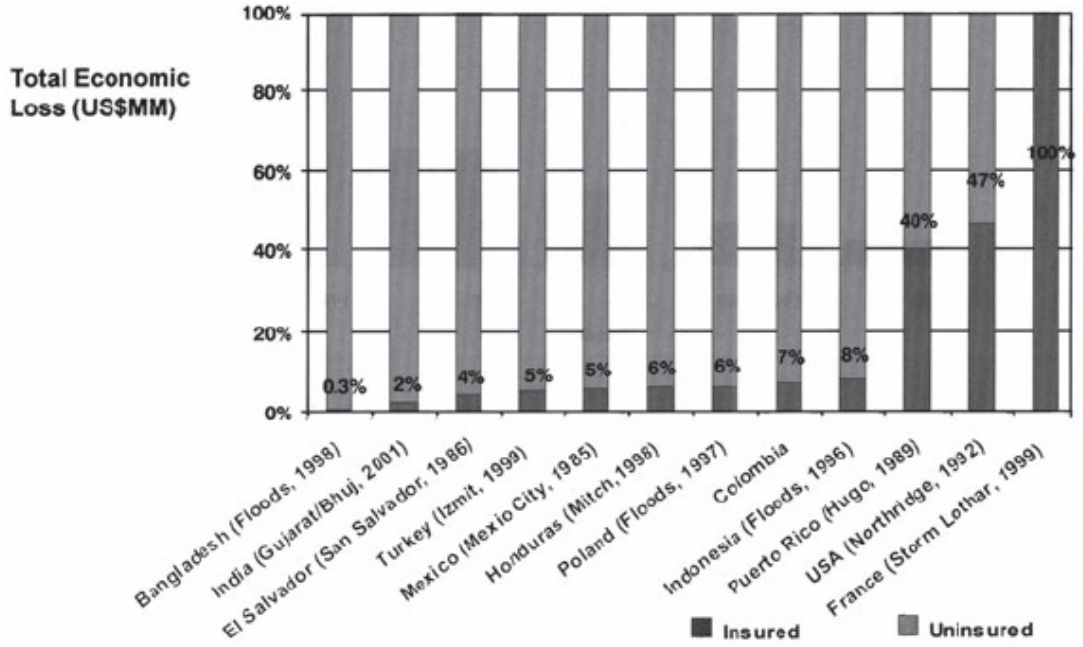
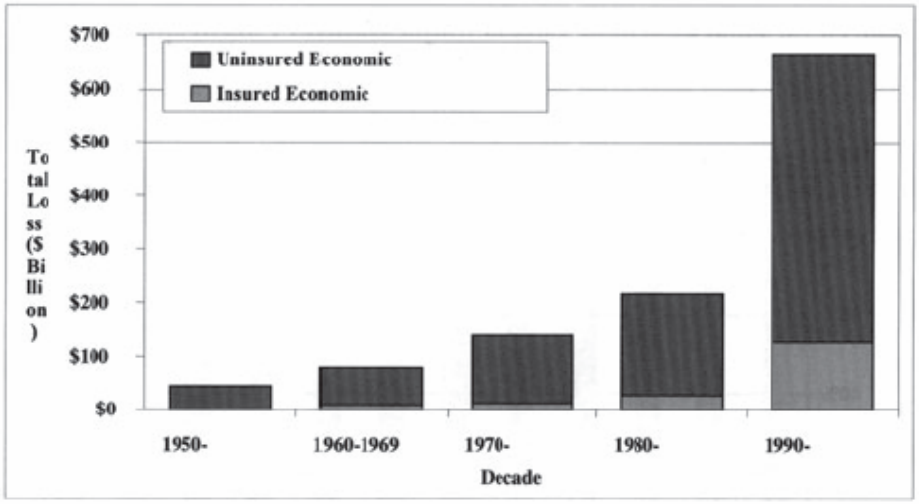


Figure A2 Losses Due to Great Natural Catastrophes Worldwide by Decade



Source: Munich Re (2002)
Topics: Natural Catastrophes 2002

Figure A3 Natural Catastrophes: Economic Losses (US$ m)

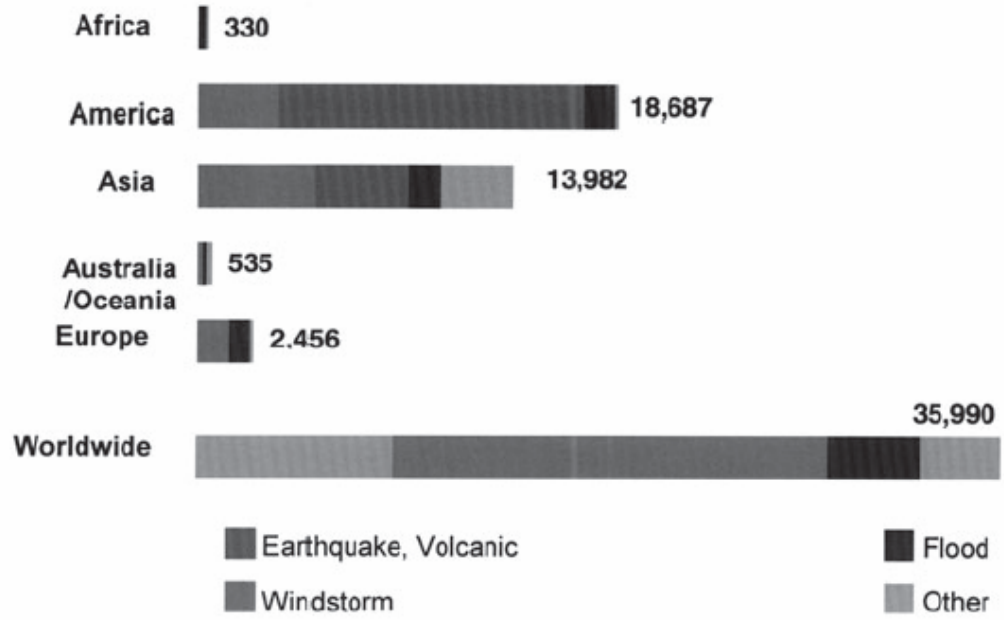
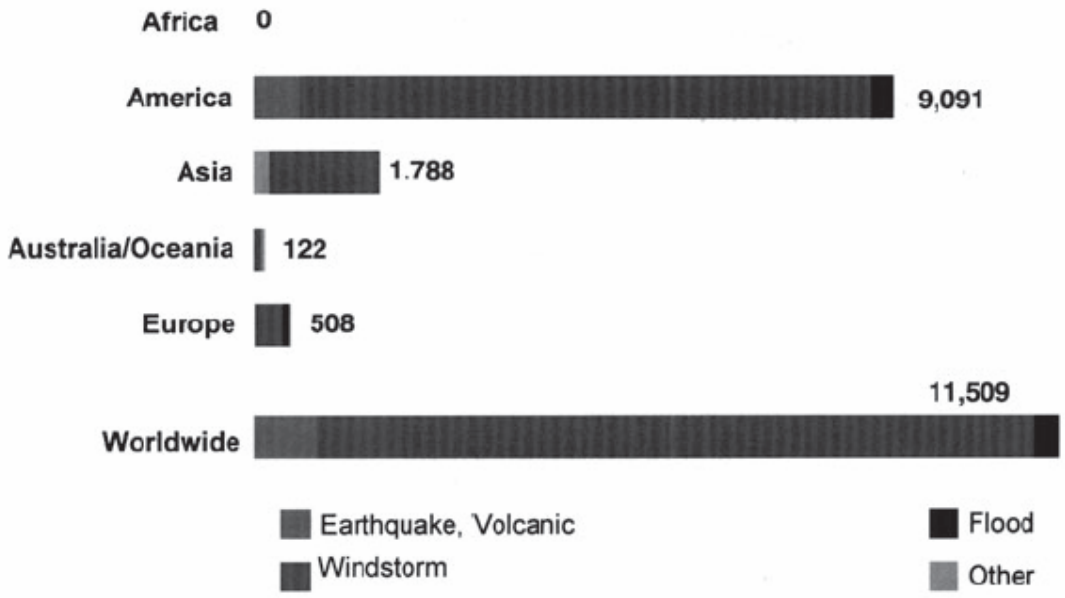


Figure A4 Natural Catastrophes: Insured Losses (US$ m)



Appendix A Roundtable Discussion Workgroups

A.1 Chemical Risks

Current Risk: Chemical (number and type of chemical accidents can be determined during the risk assessment)
Target: 10 % reduction in chemical accidents after 2003
Time: 5 years
Successful Needs:

1. Transfer knowledge
2. Participation
3. Law enforcement
4. Information management system
5. Integration between departments

Plan: Committee for National Master Plan for Chemical

Stakeholders:

- DDPM
- Ministry of Interior
- The Port Authority of Thailand
- Pollution Control Department
- Ministry of Commerce
- Department of Industrial Works
- The Customs Department
- Ministry of Environment
- Ministry of Agriculture and Cooperatives
- Ministry of Defence
- Ministry of Transport and Communications
- Ministry of Science
- NGOs
- Private sectors

Establishing Partnerships

Government Level	Partnerships	Stakeholders	Coalitions
International	UN, Red Cross, USA, UNESCO		
Asia	JICA, Japan, ADPC		
Southeast Asia	ADPC, CO-ERR, ASEAN		
Neighboring Countries	Singapore, Malaysia		
National	Chulabhorn Research Institute, Government offices, Red Cross, The Thailand Research Fund, Universities,		

Government Level	Partnerships	Stakeholders	Coalitions
	State Enterprise, The Federation of Thai Industries		
Sub-National			
Provincial	Foundations, government offices, NGOs, Department of Industrial Works		
Communities		Volunteers, NGOs, foundations, individuals	

A.2 Floods

Time: Year 2004 – 2008
Target: Reduction of death by15% (not more than 250 persons per year)

Item 1 - Schedule

Year	2001 – 2003	2004	2005	2006	2007	2008
Percentage of Reduction	~250pax/yr	10%	15%	20%	25%	30%

Item 2: Methods

1. Specify risk areas
2. Make damage assessment through
   2.1) Scientific approach
   2.2) Collecting statistics records from community
3. Participation plan from provincial, district and community levels
4. Community:
   - Develop good Early Warning System
   - Provide equipment for community
   - Develop systems for community
   - Establish network
   - Receive training

Item 3: Develop plans

- Community
- Local

Item 4: Stakeholders

- Community
- Local
- NGO
- Private sectors

A.3 Flood Disaster Prevention and Mitigation Plan (2004–2008)

Target: Reduction of death by 30%
Strategy:

1. Early Warning System
2. Public awareness
3. Community capacity building
4. Networking
5. Law enforcement

Main Organization: **DDPM**
Co-Organizations: Public Works Department, Irrigation Department, Department of Local Administration, Department of Mineral Resources, The Meteorological Department, community

Government Level	Partnership	Stakeholders	Coalitions
International	INSAR, UNDAC, ADPC, UNHCR, USAID		
Asia	UNOCHA	JICA, ADRC	
Southeast Asia	ACDM, PDC, ADPC	12 DPMRCs	
Neighboring Countries	Singapore, Malaysia		
National	Ministries and departments		
Sub-National	19 provincial groups		
Provincial	- Provincial Committee - Municipality Committee - Provincial Management Committee		
Communities	-Sub-district, Municipality, Foundation, Committee	Community	Community Initial plan

A.4 Transportation/Road Accidents

Target: 19:100,000
5 years

Strategies: 5E's—

- **E**ducation
- **E**ngineering
- **E**nforcement
- **E**MS
- **E**valuation

Main Organization: DDPM
Co-Organizations: Local community authorities

Government Level	Partnership	Stakeholders	Coalitions
International	OFDA		
Asia	AIT		
Southeast Asia	ADPC		
Neighboring Countries	Singapore, Malaysia		
National	Red Cross, Por Tek Teung Foundation		
Sub-National	NGO named Ruam-Duay-Chuay-Kan Public Health Center Provincial Transportation Services		
Provincial	Provincial Red Cross Police Local authorities		
Communities	Local NGO Private company		

A.5 Fire Accidents in High-Rise Buildings

1. **What is the risk for fire at present?**

   Fire accidents in urban high-rise buildings have a potential for increase, due to:

   1. Construction standards (buildings do not comply to the standard)
   2. Fire safety system (before and after fire accidents)
   3. Perception of management levels
   4. Preparedness/inspections
   5. Drills

2. **Target for risk reduction**

   Reduce 50% of fire accidents in high-rise buildings

3. **Duration for achieving** - 5-year target

4. **Develop risk reduction plan, arrange drills, build right understanding/ perceptions among relevant people**

5. **DDPM + Community (ปภ. + ยผ + ชุมชน)**

   Local ⟶ Local Level
   Community ⟶ Community Level

6. **Affected people are in community, at local level and in government sectors**

Establishing Partnerships

Government Level	Partnership	Stakeholders	Coalitions
International	NFPA		
Asia	ADPC, Japan (NIED)		
Southeast Asia	ADPC, Singapore		
Neighboring Countries			
National	Public Works Department and Department of Town and Country Planning, Port Authority Training Center, NGOs, Refinery		
Sub-National	DPM regional and provincial, army, police, municipal limits		
Provincial	Governors, local administration offices, private sectors/NGOs/ volunteers		
Communities	Local administration offices community leaders, volunteers, private sectors		

Conclusion

The goal of the workgroups was to provide experience with the risk management process. The Round Table Discussion workgroups applied this process to the identification of risk reduction measures to address potential hazard affects facing Thai society. The process included the selection of a risk based on the knowledge and experience of workgroup participants. Participants estimated the base-line status, identified a risk reduction target and proposed an implementation schedule. This information can be used after the implementation of selected risk reduction measures to evaluate their effectiveness. Each workgroup also identified potential relationships (partners, coalitions or stakeholders) that might assist in further assessing, evaluating, assigning priorities and implementing risk reduction policies.

Appendix B – Integrating Risk Management

Adopt risk management policies to support sustainable development, including:

(1) An institutional policy to establish senior management commitment and establish a framework for a DDPM Total Disaster Risk Management program;

(2) Risk reduction policies to guide the development and implementation of prevention and mitigation measures;

(3) Risk finance policies to establish mechanisms to provide resources in the amounts and at the times needed to address disaster impacts; and

(4) Policies to promote the involvement of partners and stakeholders to assist in developing and implementing Department Disaster Management and Prevention and Total Disaster Risk Management strategies, goals and objectives.

Obtain senior management commitment

Establish a risk management and mitigation culture

A risk management and mitigation culture may be nurtured by the promotion of a number of steps identified in the KPMG study and in the Hazardous Materials Transportation Risk Management Program (Research and Special Programs Administration's (RSPA) Office of Hazardous Materials Safety (OHMS). 2000).

1. Distribute a DDPM Director's letter throughout the organization establishing the importance of the risk management program to senior management
2. Define a common risk language
3. Establish an organizational structure to support risk management activities
4. Allocate resources to support risk management activities
5. Appoint a DDPM Risk Officer
6. Establish a Risk Management Advisory Board led by the DDPM Risk Officer
7. Include division and bureau representatives on the advisory board, as appropriate; invite stakeholders to address specific issues; establish partnerships
8. Establish overall program policy; make institutional and legal arrangements
9. Prepare and distribute written policies stating the DDPM commitment and detailing the accountability of personnel
10. Dedicate resources for conducting risk measurement and risk management efforts
11. Establish open communication with managers and personnel; identify each person's responsibility to proactively identify and act to reduce risks
12. Provide training and guidance
13. Apply risk management concepts, principles and best practices to DDPM projects and activities
14. Preserve and enhance rather than duplicate existing risk management approaches
15. Foster the careful consideration, understanding and management of risks in department activities
16. Maintain flexibility to allow for adapting and applying best practices to a range of risks

17. Define measures of success, set milestones and prepare evaluation procedures

Establish organizational risk management program

- Appoint a Department Risk Officer
- Establish ownership of the Risk Management Function (for example, Finance?)
- The Risk Officer chairs the Department Risk Management Advisory Board

Establish a common risk language

- Training and education
- Newsletters, memos

Promote open communications

Establish a mechanism to assess communication risk performance

Establish teams and committees

Internal teams and committees

- Develop a strategic plan to guide internal and external risk management focus
- Identify and involve stakeholders to provide advice on assessing and evaluating risks related to specific issues of department concern
- Build partnerships and coalitions at the national level

External teams and committees

- Provide training to local communities on team building
- Assist local communities in the development of a risk management committee
- Provide knowledge and assistance

Prepare guidance documents

Deliver risk management training

Implement risk management program

Monitor and review risk management program

Establish measures of success
Collect baseline data
Collect data to determine progress toward goals and objectives
Survey divisions, bureaus, etc., to identify organizational and project risks

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