

## *Chapter 2*

### **SURVEY OF COUNTRY APPROACHES**

*This chapter is aimed at taking stock of the current institutional approaches to the financial management of large-scale catastrophes in selected OECD and non-member countries. It is largely based on the elaboration of data provided by several countries that responded to an OECD questionnaire survey.*

## SELECTED OECD COUNTRIES

### AUSTRALIA

Natural events such as *floods*, *bush-fires*, *hail*, *earthquake*, *tidal surge* and *tropical cyclones* occur regularly across the Australian continent. They cause severe damage each year to homes, businesses and the country's infrastructure, along with serious disruption to communities, especially in capital cities and along coastlines.

The Australian government has risk assessment, hazard monitoring, weather forecasting and warning service capabilities in various agencies across Australia. The Bureau of Meteorology provides weather forecasting as well as warning services for tropical cyclones, severe thunderstorms, bushfire, flood and marine conditions. Geoscience Australia also undertakes risk assessment and risk research activities, including the development of risk models and innovative approaches to assess the potential losses to Australian communities from a range of sudden impact natural hazards. Models are being developed to assist planners and decision makers in assessing community risk and effectiveness of various mitigation strategies. Of these hazards, Geoscience Australia conducts basic research into the origin and consequences of earthquakes and landslides; for other hazards, the group relies in part on basic data and hazard parameters from other agencies (*e.g.*, the Bureau of Meteorology) for input to hazard and risk model development. The Bureau of Meteorology and Geoscience Australia have shared responsibility for the recently established Australian Tsunami Warning System.

Scientific agencies such as the Australian Commonwealth Scientific and Research Organisation (CSIRO) and the Co-Operative Research Centres, in addition to university research centres, also undertake natural hazard research and regularly collaborate with government to work toward reducing risks from natural hazards.

Under the Australian Constitution, protecting the community and property from natural disasters is primarily the responsibility of the State and Territory Governments. However, the Australian government assists the States and

Territories by enhancing their response capabilities and providing extra financial resources as required.

### ***Natural Disaster Relief and Recovery Arrangements (NDRRA)***

In recognition of the unpredictable nature and potentially significant costs of relief and recovery measures, as well as the disruption and cost to communities, the Australian Government has Natural Disaster Relief and Recovery Arrangements (NDRRA) in place to alleviate the financial burden of catastrophes on States and Territories and to facilitate the early provision of assistance to disaster affected communities.

Under the NDRRA, which were first formalized more than thirty years ago and are managed by Emergency Management Australia, the Australian government provides partial reimbursement of a range of State and Territory natural disaster relief and recovery expenditures. Disasters covered by the NDRRA include bushfires, cyclones, earthquakes, floods, storms, storm surge, landslides (consequential upon an eligible disaster event), tornados and meteorite strikes. Expenditure each year varies substantially, depending on the incidence and severity of natural disasters<sup>1</sup>.

Australian government financial assistance is not normally provided until after a natural disaster has occurred and is calculated on the basis of: half of State and Territory outlays incurred in providing PHD (personal hardship and distress) relief for a specific disaster where State or Territory disaster expenditure exceeds the small disaster criterion (currently AUD 240 000) in respect of each disaster; half of State or Territory expenditure on eligible relief measures above a threshold base amount (0.225 per cent of State or Territory revenue) up to the second threshold (1.75 times the first threshold) where the Australian government reimburses three quarters of all further expenditure. Once a natural disaster has been notified, the relevant State/Territory Government seeks reimbursement from the Australian government under the above criteria. Individuals wishing to seek assistance will need to contact in the first instance their respective State/Territory emergency response agency.

It is important to note that a principal objective of the NDRRA is to ensure that disaster relief assistance does not operate as a disincentive to effectively plan, mitigate and allocate sufficient resources for disasters or to discourage individuals or businesses taking out appropriate insurance to protect their assets and income.

Subject to the limitations and exclusions indicated below, natural disaster coverage is generally included in property and motor insurance both in personal

and in commercial lines<sup>2</sup>. In addition, some commercial insurance packages may include business interruption insurance that may be triggered by a natural disaster. In personal insurance (motor and home and contents), policies generally cover a range of natural disasters. Standard home and contents policies, however, exclude coverage for subsidence, landslide, flood and for “action of the sea”, including storm surge, high tide and tsunami. In commercial insurance, coverage is generally available for effectively most natural disasters at a risk rate, although some small business policies may include specific exclusions for flood. Most commercial policies also have exclusions for “action of the sea”. There are no fiscal or other incentives to insure against natural disasters and the purchase of natural disaster insurance by the population or corporate entities is not compulsory<sup>3</sup>.

Authorised general insurers in Australia are subject to prudential regulation and oversight by the Australian Prudential Regulation Authority. A significant part of this oversight is a requirement for insurers and reinsurers to determine their maximum potential exposure and demonstrate that they have sufficient capital and reinsurance arrangements to cover that exposure. Natural disaster risk is generally shared across the industry and within global reinsurance markets. The net effect of this prudential oversight is that individual insurers and reinsurers are not highly exposed to natural disaster risks. There has been no recent failure of an Australian authorised general insurer or reinsurer in the aftermath of a natural disaster.

In its industry code of practice, Australian general insurers have made a number of commitments in responding to catastrophes and disasters<sup>4</sup>. Moreover, the new Industry Catastrophe Coordination Plan, managed by the Insurance Council of Australia (ICA), is designed to coordinate the response required in disasters so that the insurance industry can work with government and emergency services to provide the best possible response and recovery service for the people who have been affected by a natural disaster<sup>5</sup>.

According to recent estimates, over the last 5 years, the Australian Government has covered around 25 per cent of the total estimated loss arising from natural disasters. In addition to the assistance provided by the Australian Government, state, territory and local governments have provided a similar level of assistance to the community where a natural disaster has occurred.

Against this backdrop, a review of the approach in dealing with natural disasters was commissioned in 2001 by the Council of Australian Governments (COAG – the Council is made up of the Prime Minister and the first Minister of each State/Territory government and the President of the Australian Local Government Association). The review examined Australia’s approach to

dealing with natural disasters and concluded that the national framework for natural disaster management could be improved with a view to achieving safer, more sustainable communities, and reduced risk, damage and losses. Central to this approach was the recommendation of a need for a systematic and widespread national process of disaster risk assessments and a special focus on anticipation and mitigation. The review recommended a series of reform commitments and a five-year Disaster Mitigation Australia Package for which the Australian government announced new funding: the Natural Disaster Mitigation Programme was a key component of this package. There have been a number of Australian post-disaster reviews that were commissioned after particular disasters, and which are available in the public domain.

### ***Australian Reinsurance Pool Corporation (ARPC)***

With a view to providing coverage for damages caused by terrorist acts, the Australian Reinsurance Pool Corporation (ARPC) - a hybrid pool/post funded scheme – was established in 2003 under the *Terrorism Insurance Act*. The relevant legislation overrides terrorism exclusion clauses in eligible insurance contracts and eligible terrorism risks can be reinsured with ARPC<sup>6</sup>.

A definition of ‘terrorist act’ for the purpose of this scheme together with the process to determine when an event is a ‘terrorist act’ is set out in Section 6 of the *Terrorism Insurance Act*. The legislation requires a declaration from the Treasurer, following consultation with the Attorney General, that an act was a ‘terrorist act’ for the purpose of the scheme.

Australia’s terrorism insurance scheme applies to insurance for commercial property in Australia and associated business interruption losses and public liability claims. The Act operates so that terrorism exclusions in eligible insurance contracts are deemed to have no effect. In turn, insurers can reinsure any terrorism risks that the Act requires them to assume with the Australian Reinsurance Pool Corporation (ARPC), which was established to administer the scheme. The ARPC charges insurers a premium for reinsurance and requires that they retain some terrorism risk. The scheme provides cover for terrorism risks through a number of layers. The first main layer of cover is provided by a monetary pool (which was initially planned to accumulate to AUD 300 million), funded by reinsurance premiums. The pool is supplemented by a line of credit of AUD 1 billion, which is underwritten by the Government, after which the Government has provided an AUD 9 billion indemnity.

A report issued by the Treasurer in 2006<sup>7</sup> recommended refining the scheme. Specifically, the report recommended requiring the ARPC to continue charging premiums for reinsurance at the current rates; that once the pool

reaches AUD 300 million, the ARPC has discretion to use premiums to build the terrorism insurance pool further or purchase reinsurance for the scheme; increasing insurer retentions under the scheme; that in relation to bundled insurance policies, requiring the ARPC to charge reinsurance premiums only on those sections of the policy that exclude terrorism risks; and modifying the scheme to cover all commercial insurance provided for public authorities, ensuring consistent treatment to insurance for government business enterprises and local government (which the scheme currently covers) and other public authorities that commercially insure, such as some local water utilities (which the scheme currently excludes). These refinements are aimed to encourage greater participation of the commercial market and to increase the consistency of the scheme's application to commercial property and infrastructure.

## AUSTRIA

The types of natural disasters to which Austria is most exposed are **floods, storms, hail, avalanches, mudslides** and **earthquakes**. Austria is vulnerable to these disasters since there are numerous buildings that have been built in zones highly exposed to earthquake, avalanche and flood risks, for example along the Danube. A new risk zoning and mapping model for floods (HORA) has been developed through a private-public partnership between the Federal Ministry of Agriculture, Forestry, Environment and Water Management and the association of Austrian insurance companies (*Versicherungsverband Österreich*). This publicly accessible model is aimed to increase risk awareness and facilitate insurance penetration<sup>8</sup>.

The responsibilities of the Central Institute for Meteorology and Geodynamics, an agency affiliated with the Federal Ministry of Education, Science and Culture, include all activities usually carried out by a national meteorological and geophysical service, such as providing information, advice, and warnings in cases of crises and incidents as well as natural and environmental disasters, and gathering and treating the results of meteorological and geophysical examinations. The Central Institute also compiles hazard zone maps about earthquakes. Hazard zone maps for rivers, mountain torrents and avalanches, including assessments of risks, are adopted by the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

### *Coverage for natural perils*

In Austria, losses from **natural disasters** are covered on the one hand by the private insurance market and, on the other hand, by the Austrian Catastrophes Fund. Private insurance cover for losses caused by earthquakes, floods, storms, hailstorms, avalanches, landslide and mudslides is available, but

reportedly not widespread. There is no comprehensive natural disaster insurance policy in private insurance markets in Austria. Rather, private insurance cover for losses caused by natural catastrophes is provided in the framework of (i) a windstorm insurance (hail, rock slide, landslide) and (ii) a limited coverage for losses caused by natural catastrophes such as floods, earthquakes and avalanches. The insurance cover for floods, avalanches, or earthquake losses is low and premiums are not usually dependent on risks. Further compensation and assistance is provided by special laws enacted on an *ad hoc* basis<sup>9</sup>.

While existing insurance coverage is limited, Austrian insurance companies are exposed to natural disaster risks, since such risks are mainly written by national companies. However, no insurance or reinsurance company has failed as a result of a disaster in Austria. Based on HORA, the new risk zoning and mapping model for floods, it should become possible for Austrian insurance companies to introduce more effective risk-based premiums.

At present, private insurance against losses caused by natural forces is not able, alone, to provide adequate coverage. Large losses from natural disasters are compensated by the Austrian Catastrophes Fund established in 1966 and currently governed by the Catastrophes Fund Law of 1996, which is financed through shares in the income tax, the reward tax, the corporation tax and the capital yield tax. The amount of endowment which is not consumed by compensations is brought into a reserve. This system of financing by running tax shares and compensation of an increased financing requirement out of the reserve proved itself as more or less sufficient in the past.

Extreme situations, however, such as the extraordinary flood of 2002 can prove that this system is insufficient to grant quick aid and reconstruction of destroyed infrastructure of damaged areas. In order to guarantee the financial means for assuring adequate aid to injured persons and for reconstructing the damaged infrastructure additional resources were granted by the Austrian Parliament in the year 2002. Additional amounts were also granted for the execution of urgent measures and the accelerated implementation of preventive measures to avoid high water damage. In the aftermath of the floods of 2002 and 2005, the Austrian Government conducted in-depth post-disaster reviews.

### ***Coverage for terrorism risks***

In order to facilitate the coverage of **terrorism risks**, the *Österreichischer Versicherungspool zur Deckung von Terrorrisiken* was set up on 1 October 2002 by the Austrian insurance association (*Versicherungsverband Österreich*) as a purely private co-reinsurance pool, with no state guarantee<sup>10</sup>. The capacity of the Austrian terrorism risk pool amounts to EUR 200 million

(EUR 50 million are borne by direct insurers, while the reinsurers' contribution totals EUR 150 million). In the event of losses exceeding EUR 200 million in one year, the payments would be reduced on a pro-rata basis.

## **BELGIUM**

Belgium is exposed to a diverse array of natural hazards, the most frequent being *storms, floods, ground subsidence, cyclones* and *earthquakes*. Floods, on average, lead to the most significant damages. A sufficiently powerful storm could destroy property throughout the entire country. Earthquakes did not result in much damage in the past, but a strong earthquake in a heavily urbanized area could result in considerable damages.

In comparison with other OECD countries, Belgium has not known a large-scale natural catastrophe. This helps to explain, in part, the limited resources dedicated, to date, to enhancing risk awareness, the evaluation of risks, and their prevention. National legislation contains very few measures that promote risk prevention. According to the Belgian authorities, policies promoting prevention and mitigation of risk could be better developed and coordinated in light of the future evolution of natural disaster risks in Belgium. Regional authorities in Belgium have developed mathematical models in the area of water management. These models can be used with a view to simulating floods. It appears that certain insurance companies also have similar types of models but do not publish them.

### ***Insurance coverage for natural perils***

As of early 2006, insurance against natural catastrophes was fairly limited, with the exception of storms, which were, by law, required to be included in fire insurance policies covering "simple risks" (i.e., low-value private housing and low-value private and public buildings). Insurance coverage of natural catastrophes is expected to increase as a result of major amendments introduced in September 2005 that required all fire insurance contracts covering simple risks to cover not only storms but also all natural catastrophes. Mandatory rules define the perils covered (storms, earthquake, flood, public sewage overflow and backflow, landslide, and ground subsidence) and the indemnification criteria. The requirement for full disaster coverage, which took effect for all fire contracts issued after March 2006, applies to both direct and indirect losses from natural catastrophes. The new regime also applies to existing fire insurance contracts upon their first annual renewal.

In this system, the Belgian *Bureau de Tarification* is responsible for ensuring adequate coverage and specifies rates and conditions for risks that are



not willingly covered by fire insurance companies (“BT risks”). All potential policyholders have access to these rates and conditions and any fire insurance company that refuses to offer a fire policy or that charges a higher premium or deductible than that set out by the Bureau must inform the potential policyholder of the rates and conditions set forth by the Bureau as well as inform the potential policyholder that he/she can go to another insurer for business. Natural catastrophe risks that are covered pursuant to the Bureau’s rates and conditions are covered by all fire companies selling fire policies covering simple risks under the terms and conditions of the Bureau, up to a limit, with the excess being reinsured by the state, subject to a pre-determined ceiling. This two-layered arrangement, involving a partnership between the public sector and private insurance companies, is, more specifically, as follows:

1. **Mutualization of losses among fire insurers participating in the CaNaRa scheme:** A non-profit, government-mandated, loss-sharing industry body, called ASBL CaNaRa<sup>11</sup>, serves to spread disaster losses across members of the scheme, according to a pre-determined formula, as well as to fund the *Bureau de Tarification*. This arrangement effectively involves a sort of market-wide coinsurance agreement. This loss-sharing scheme is limited to catastrophic risks and does not concern other risks that the insurers cover pursuant to their own conditions. In regard to BT risks, each insurer is responsible for the share of losses corresponding to its share of the market for fire insurance (simple risks), calculated on the basis of premium income. The amount of losses exceeding this share is reimbursed to the insurer by CaNaRa. An insurer is obliged to pay into CaNaRa the amount of premium income that exceeds its market share.
2. **Compensation from the government-backed national calamity fund:** Fire insurers participating in the CaNaRa scheme can cap their aggregate exposure to catastrophic losses, in accordance with specific formulas<sup>12</sup>. As soon as the ceiling is reached, the insurance company can file a claim with the national calamity fund, or *Caisse nationale des calamites*, which will reimburse the difference between the established ceiling and the total indemnities to be paid by the insurer. This second level of compensation, therefore, introduces a loss-sharing arrangement between the private and public sector. The insured parties only deal with the insurance company, which advances payments that will, in turn, be reimbursed by the *Caisse nationale des calamites*. The intervention of the *Caisse* is limited, on a per event, market aggregate basis, to EUR 700 million in case of earthquakes and to

EUR 280 million for the other natural catastrophes covered. If this ceiling is reached, the indemnity to be paid to the insured parties – that is, the fire insurance policyholders – is reduced proportionally. In consideration of the amounts set by the law (in excess of the indemnities paid by private insurers), this hypothesis is relatively remote.

Belgian financial regulation requires insurance companies to establish an equalization and catastrophe provision in recognition of potential non-recurring losses and special risks that could occur in the future. This provision enjoys partial tax advantages.

While the introduction of extended mandatory insurance coverage against natural disasters will, in the short term, increase the level of disaster insurance coverage in the population, as all those with fire policies for simple risks will enjoy extended coverage, it is conceivable that the degree of coverage could fall in view of increased premium rates arising from the extension of fire coverage to all natural catastrophes. An evaluation of the level of insurance coverage against natural disasters will therefore not have any value until the insurance market has stabilized subsequent to the intervention of the *Bureau de Tarification*.

### ***Insurance coverage for terrorism risks***

Further to a Law enacted in 2007, since 1 May 2008 terrorism risk coverage is mandatorily included in the following classes of insurance contracts covering risks located in Belgium: life insurance (individual and group policies), accident and health insurance (including work accidents), fire insurance for households and small businesses, liability insurance for public places in case of fire or explosion, and third party motor liability insurance. The new regime also applies to existing contracts upon their first annual renewal.

The Law includes a definition of “terrorism”<sup>13</sup>, which appears to be modeled on the *OECD Check-List of Criteria to Define Terrorism for the Purpose of Compensation*<sup>14</sup>. The occurrence of a terrorist act must be officially declared by a special Committee, composed of representatives of the government, the Banking, Finance and Insurance Commission (CBFA) and the reinsurance industry.

In compliance with the provisions of the Law, the ASBL TRIP (Terrorism Insurance & Reinsurance Pool) was established on 1 February 2008 as a non-profit organization to distribute the cost of terrorism cover among the participants<sup>15</sup>. TRIP provides coverage of terrorism risks up to a global annual

limit of EUR 1 billion (adjusted every year based on the Consumer Price Index relative to December 2005). Under this scheme, EUR 700 million (indexed) capacity is provided by the insurance and reinsurance industry, while the government offers an excess capacity of EUR 300 million. The ceiling of EUR 1 billion (indexed) can be changed by the government in response to new risk conditions. Participation in the pool is not mandatory, but only TRIP members benefit from the liability cap established by the Law.

## CANADA

The majority of Canada's disasters are due to *weather-related events* (e.g., hurricanes, tornadoes, hailstorms, blizzards, ice storms, and floods). **Flooding** is the most common type of disaster occurring in Canada. Geological hazards, particularly *earthquakes*, also pose a significant geophysical threat to Canadians and the Canadian economy. For example, in the past century, there have been severe earthquakes (5.5 - 7.5 on the Richter scale) in a number of major Canadian centers including Montreal, Vancouver, Ottawa and Quebec City.

In addition to the array of hazards, Canada's hazard risk is exacerbated by the concentration of its population into 25 major metropolitan areas many of which are located in high risk areas (e.g. Vancouver, with a population of 2.1 million faces risk from tsunamis, earthquakes and rising sea levels). Aging infrastructure and inter-dependent technologies also have potential to increase disaster risk and costs.

The Canadian Disaster Database, maintained by federal Department of Public Safety and Emergency Preparedness (PSEPC), contains historical information on disasters that have directly affected Canadians, at home and abroad, over the past century. The database has references to all types of Canadian disasters, including those triggered by natural hazards, technological hazards, or conflict (but not war). The database describes where and when a disaster occurred, who was affected, and provides a rough estimate of the direct costs. Additionally, the property and casualty insurance industry association, the Insurance Bureau of Canada, publishes an annual table of disaster losses in their *FactsBook* publication.

According to Canadian governmental authorities, Canada has a strong culture of emergency preparedness and response. PSEPC has overall responsibility for enhancing the protection of critical infrastructure, and for safeguarding lives and reducing damage to property by fostering better national emergency management and preparedness in Canada. PSEPC consults on national emergency management priorities across prevention/mitigation,

preparedness, response and recovery through a Federal/Provincial/Territorial committee of senior officials responsible for emergency management.

The federal *Emergency Preparedness Act* (EPA) serves as the foundation for the federal government's engagement in emergency planning and its emergency management relationship with other jurisdictions in Canada. The *Act* assigns a wide range of leadership responsibilities to the designated federal ministries relating to: training and education; research and development; and to disaster financial assistance programs. The EPA also mandates each federal ministry to identify areas of accountability and to develop effective emergency plans to address identified contingencies. The EPA was, at the time that this stocktaking was undertaken, under review with a view to including reference to mitigation, among other significant proposed changes.

The Federal Policy on Emergencies (FPE) articulates the role and responsibilities of federal government departments, key concepts, and coordination mechanisms for dealing with emergencies. It underscores the need for close collaboration and coordination among federal departments and agencies, and between them and the provinces and territories. PSEPC is the linchpin in this coordination. The policy allows for periodic review and amendment to the FPE to reflect changing relationships among federal government departments or orders of government and to integrate modern emergency management concepts. Such a review is anticipated in conjunction with the review of the EPA.

Additionally, each province and territory in Canada has emergency management legislation that governs civil emergency preparedness. The primary objective of the legislation is to prevent loss of life, protect public health and welfare and minimize damage to Canadian communities. Recently, a number of provinces - Ontario, Québec, Alberta, British Columbia - have revised their emergency management legislation to emphasise the need for hazard identification and vulnerability assessment and underscore disaster mitigation as an essential component of comprehensive emergency management.

To date, the federal government has not implemented a national-level disaster mitigation strategy. As a result, Canada's emergency management approach remains predominantly response-focused. There is differential economic capacity among municipalities and provincial/territorial governments to implement mitigation measures that will ultimately influence implementation the adoption of mitigation practices in the future. There are still gaps in social-economic data gathering and estimation of disaster loss that make it difficult to demonstrate to policy and decision-makers the benefits, versus the costs, of

implementing prevention/mitigation measures in order to reduce long-term disaster vulnerability.

Canada has a comprehensive national weather warning system for a wide range of meteorological hazards. The Meteorological Service of Canada (MSC), a branch of Environment Canada, issues severe weather warnings, watches, and advisories to the public via the media, weather outlets and weather radio. The Service monitors water quantities, provides information and conducts research (including risk modelling) on climate, atmospheric science, air quality, ice and other environmental issues, making it an important source of Canadian expertise in these areas. The MSC and Emergency Management Ontario (Ontario government) have developed a community level Hazard Identification and Risk Assessment (HIRA) process that is intended to assist Ontario municipalities in assessing weather-related hazards for emergency management planning purposes.

The Canadian federal government initiated the Flood Damage Reduction Program (FDRP) in 1975 to curtail escalating disaster costs in areas of known flood hazard and to discourage development in flood vulnerable areas. Between 1975 and 1995, more than 900 communities were mapped and designated under the FDRP including some major urban centres. Although the FDRP is no longer in existence, most flood-prone areas were mapped and the provinces/territories and municipalities continue to use the zoning maps that were developed under the program to establish zoning regulations in areas of high flood risk.

Conducting a hazard risk and vulnerability assessment is critical part of every emergency program. In the province of British Columbia, this is a requirement mandated by the provincial *Emergency Program Act* that requires local authorities to prepare emergency plans. To assist municipal authorities in the regard, the B.C. government, through its Provincial Emergency Preparedness program, has developed an online hazard, risk and vulnerability analysis tool (HRVA). The purpose of HRVA is to help communities make risk-based decisions that augment disaster mitigation, preparedness, response and recovery.

A number of non-profit organizations are involved in disaster risk awareness, prevention, and mitigation. For instance, the Canadian Natural Hazards Assessment Project (CNHAP), a collaborative project with Environment Canada, is designed to assess the risk to Canadians from natural hazards and determine how those risks might be mitigated, take an inventory of gaps in knowledge, and enhance public awareness. CNHAP published the first comprehensive assessment on the state and nature of knowledge on Canadian hazards and disasters in the summer of 2003. The outcomes of this project,

funded jointly by PSEPC, the MSC and the Institute for Catastrophic Loss Reduction (ICLR), contribute to the establishment of appropriate mitigation measures for the variety of hazards. The interdisciplinary publications provide a useful reference for natural hazards researchers and emergency management practitioners and help to transfer Canadian experiences to the international community. The Canadian Risk and Hazards Network (CRHNet) is a not-for-profit organization that was established in the fall of 2003 to create an environment in which the natural hazards research, education and emergency management practitioner communities can share knowledge and innovative approaches that reduce disaster vulnerability. The CRHNet hosts annual symposia focusing on disaster reduction.

The insurance industry founded the Institute for Catastrophic Loss Reduction (ICLR) in 1998. ICLR is a not-for-profit research centre for multi-disciplinary disaster prevention research. It achieves its mission through the identification and support of sustained actions that improve society's capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters. The P&C insurance industry association, the Insurance Bureau of Canada, actively engages in promoting prevention and mitigation.

According to available data<sup>16</sup>, insurance coverage for climatic and seismic hazards in Canada is readily available in private insurance markets. The majority of the population is insured against some natural catastrophes under home insurance policies as most policies sold in Canada are multi-peril. A standard property insurance policy generally provides coverage against perils such as strong winds, tornadoes, hurricanes, hail and freezing rain. Coverage for additional perils such as torrential rain, sewer back-up, landslides and damage caused by the weight of snow are also generally available as endorsements, or additions, to the standard property policy. Some weather-related hazards, however, are not generally covered by insurance policies or endorsements because of circumstances which make them unacceptable for underwriting reasons. Damage caused by flooding of lakes, rivers and streams, as well as waves, tides and tidal waves are examples of localized risks which violate basic underwriting criteria, and thus, cannot be covered by standard insurance policies. In all provinces, except Quebec, basic fire policies cover fire loss from several causes, including earthquake and terrorist acts.

Since 1998, a regulatory framework has been in place for the management of earthquake risk in federally regulated insurance companies that includes mandatory requirements for estimating probable losses. The federal guideline stipulates that insurers must have funds available from their capital base, reinsurance arrangements or dedicated earthquake reserves to pay for the probable maximum loss resulting from a 250 year earthquake on their book of

business with the threshold level of preparedness increasing over time towards a 500 year earthquake. The property and casualty industry has, in the past, sought tax relief on income earned on these earthquake reserves. Such relief has not been granted; the amounts placed in these reserves are limited as a result. For earthquake risk, insurers rely extensively on reinsurance excess of loss cover for managing their exposures to catastrophic risk. The solvency regime also requires that companies work with their actuaries to model scenarios including significant natural disasters. The results of these models are shared with solvency regulators in setting capital requirements.

The use of alternative risk transfer instruments (ARTs) by Canadian insurers for risks dealing with natural disaster claims has not been a common practice for a number of reasons, including the availability of reinsurance and uncertainties in the regulatory environment. OSFI's guideline permits their use subject to regulatory approval.

In addition to private insurance coverage, in the event of a large-scale natural disaster the Government of Canada provides financial assistance to provincial and territorial governments under the Disaster Financial Assistance Arrangements (DFAA) that were implemented in 1970 to bring coherence and consistency to the Government of Canada's response to provincial and territorial requests for disaster recovery assistance. Provincial governments design, develop and deliver disaster response and assistance programs within their own jurisdictions. In doing so, they establish the financial assistance criteria they consider appropriate for response and recovery. The federal government supports the provincial and territorial governments through the DFAA. The DFAA are intended primarily to address natural disasters and other multi-sectoral emergencies resulting in extensive property damage or disruption of the delivery of essential goods and services. The purpose of the DFAA is to assist provinces with the costs of dealing with a disaster where those costs would otherwise place a significant burden on the provincial economy and would exceed what they might reasonably be expected to fully bear on their own.

Assistance is available under the DFAA when a province's eligible expenses incurred in carrying out its own disaster response and recovery program are above CAD 1 per capita of the provincial population (as estimated by Statistics Canada to exist on July 1<sup>st</sup> in the calendar year of the disaster).<sup>17</sup>

The DFAA are intended to support the provinces in: providing or reinstating the necessities of life to individuals, including help to repair and restore damaged homes; re-establishing or maintaining the viability of small businesses and working farms; and, repairing, rebuilding and restoring public

works and essential community services to their pre-disaster capabilities. The DFAA are not intended to replace or undermine private insurance. Private assets that are insurable are not eligible for cost-sharing.

In regard to post-disaster response, the National Emergency Response Plan (NERP) is an all hazard plan being developed by PSEPC for the coordination of federal and national support during emergencies of significant impact or complexity which may not be covered under situation-specific contingency plans or arrangements. It is based on the National Emergency Response System (NERS). The NERS is the process by which the Government Operation Centre (GOC) and Directorate monitors events, analyses implications, vulnerabilities and risk and plans and coordinates the federal response to events, both predictable and unforeseen. The NERS is divided in four phases: monitoring and reporting; risk assessment and analysis; planning, and operations coordination. The risk analysis phase includes detailed assessment of risks, and considers the most likely scenario, the likely impacts on local population, critical infrastructure, emergency responders, security, the environment, the economy and on the political scene as well as vulnerabilities and government's tolerance to risk. Based on this information the planning process takes place to respond to events and to manage its negative impact.

National and regional catastrophe contingency plans are developed in Canada. Contingency planning is initiated when an event can be predicted or seems imminent (*e.g.*, annual cycle of flooding and forest fires, a catastrophic earthquake on Canada's west). Contingency plans lay out the federal response for the initial disaster response based on the most likely scenario. Contingency plans also provide direction for readiness activities, potential for mitigation of further damage, and post-disaster recovery planning and ensure the necessary level of operational preparedness. This type of planning relies on solid hazard and risk management research and detailed analysis.

In total, the estimated cost of natural disasters in Canada since 1970 is CAD 40 billion. An estimated CAD 7.8 billion in damages was caused by the 1996 Saguenay River flood in Québec (over CAD 1.5 billion), the 1997 Red River flood in Manitoba (almost CAD 1 billion) and the 1998 Eastern Canada Ice Storm which struck Ontario, Quebec, and New Brunswick (exceeding CAD 5 billion). Firestorm costs in British Columbia are estimated at CAD 700 million, the federal share of which under the DFAA could reach CAD 200 million. These figures do not take into account the cost of provincial/territorial disasters that do not meet the DFAA threshold, making it very difficult to provide a meaningful estimate of ex post payments for disasters by governments.



Post-disaster reviews have been conducted. For instance, the province of British Columbia experienced the worst forest fires in its history during the summer of 2003. Following the post-event review of the 2003 fires, commissioned by B.C. government, the federal Canadian Forestry Service initiated an assessment of the vulnerability of Canadian forests and forest-based communities to wildfire. The recommendations of the provincial review are publicly available<sup>18</sup>.

## CZECH REPUBLIC

The Czech Republic is most exposed to *floods* and the areas with high density of population and industry are especially vulnerable. Catastrophic risk insurance, including floods insurance is reportedly available, but market conditions after the 2002 floods have changed. Some insurance companies currently use a risk zoning system (Geographic Information System - GIS) for the evaluation of flood risk; this technology was acquired by the Czech Insurance Association and it identifies four different flood risk zones in the Czech Republic. Pricing of flood insurance is, therefore, based on the location of the property to be covered. The Flood Risk Assessment Tool (FRAT), developed through collaboration among the Czech Insurance Association, Multimedia Computers, and Swiss Re, covers 16 000 km of rivers and streams in the Czech Republic, enabling accurate assessment of flood risk; this technology fully supports the underwriting process of primary insurers and it can also be used as a basis for improved flood accumulation reporting and control. The GIS is also used by Czech insurance companies for the evaluation of storm risk.

Flood risk coverage is marketed on a voluntary basis in this country, as a component of property insurance policies<sup>19</sup>. Over 50 per cent of Czech households in 2004 had insurance policies on household contents. Insurance companies can take into account, regarding the setting of premiums, the level of prevention undertaken by the policyholder; this may also affect the deductible. The policyholder may be remunerated by a bonus in case there are no losses. Even if data on penetration rates and coverage limits are not readily available, it is reported that foreign reinsurance companies played an important role in financing flood losses in 1997 and 2002. It is also reported that approximately 50 per cent of flood losses in 2002 (CZK 70 bn in total) were covered by private insurance, but Czech primary insurers had ceded more than 90 per cent of the risk to foreign reinsurance undertakings, so that they did not experience financial difficulties. For those losses not covered by private insurance, *ad hoc* compensation has often been made available *ex post* by the State.

The establishment of technical provisions in the Czech law corresponds to the European insurance legislation. There are no special technical provisions for catastrophic losses only. Reinsurance arrangements play, as noted, a large role in the management of disaster insurance risks by domestic Czech insurance companies. For the time being, ART instruments are not employed and they are not expected to be used in a significant way to cover natural disaster risks.

An integrated rescue and crisis management system has been developed with a view to ensuring the collection and distribution of information in the aftermath of a catastrophe, as well as the coordination of fire brigades, army units, police and other authorities involved. Post-disaster reviews have been conducted in the Czech Republic and are available through the Office of State Supervision in Insurance and Czech Insurance Association.

## DENMARK

The most significant natural risks in Denmark are *storms, flood* and *hail*.

Almost every person with any kind of property insurance is insured against windstorm damage. Danish insurance companies mainly reinsure their windstorm risk with international reinsurance companies. The Danish Financial Supervisory Authority engages in continuous reviews and on-site inspections to assess whether domestic insurance companies have sufficient reinsurance cover and sufficient capital to absorb losses resulting from a catastrophic event.

A government-backed scheme was established in 1991 as a compensation mechanism to cover the losses resulting from the floods caused by overflowing of the sea. The scheme was extended in September 2000 to compensate for windstorm damage in woods, provided that a base policy covering storm is in place.

All property insured against fire is automatically covered by the scheme. The scheme is funded through a tax on every fire insurance policy, except for vehicle insurance. The scheme is administered by a central government entity – *Stormrådet* (Storm Council) – assisted by the insurance companies. The Storm Council has its secretariat at the Danish Insurance Association. The Council is entrusted with the authority to decide whether there has been flood or windstorm damage in an area within a certain period of time.

Denmark has contingency plans for natural and other disasters, with the scope of the contingency plan depending on the specific incident and its potential consequences. These plans might involve different authorities such as the Emergency Service, the Meteorological Office, and other agencies.

## FINLAND

In Finland, the main natural catastrophes threats relate to *storms* and *floods*. Authorities responsible for environmental issues and rescue services evaluate the risks relating to natural catastrophes. A national working group on exceptional floods examined, in 2003, the best methods of flood prevention and risk assessment.

After the 2004 tsunami in Asia, planning for a national warning system of natural catastrophes (LUOVA) was initiated. The warning system will comprise several information networks and a 24-hour weather forecast service. The aim is to produce on-line information on natural catastrophe threats both abroad and in Finland.

Insurance companies enhance disaster risk awareness concerning, *e.g.*, damages to woods and fire damages, through the provision of general information to consumers and policyholders on the prevention of damages.

The government of Finland decided, in 2003, on a policy that recognizes the most vital functions in society and the need for strategies to safeguard these essential functions. On the whole, this policy is controlled and guided by the government; every Ministry is responsible for specific tasks and projects in the field of their own affairs.

According to Finnish legislation on “exceptional conditions in society”, the government can provide guarantees to certain vital (export and import) transport insurance contracts that could otherwise not, due to exceptional conditions, be reinsured on the market. This authority is available only under certain conditions, such as war conditions or after a major disaster.

Insurance undertakings are required, by law, to be prepared and have in place plans to maintain the vital functions in exceptional conditions. The government is allowed to regulate financial and insurance markets in the event of exceptional conditions, as specified in the legislation.

There is no compulsory natural disaster insurance. Floods are not insured against through traditional household insurance<sup>20</sup>. Damages related to exceptional floods are offset by compensation to injured parties through the state budget. Under the *Act on Compensation of Exceptional Floods* (Law n.284 of 1983), exceptional floods in inner lakes, rivers, and such water areas are compensated by the State in Finland. Damages covered include: damage to woods, private roads and bridges, buildings, and private property.

Storms are insured against in approximately 70 per cent of household insurance contracts, and in almost all commercial property insurance policies. National insurance companies are not highly exposed to natural disaster risk at the moment and ARTs are not currently used in this country.

## FRANCE

In France, the compensation of victims of catastrophic events (natural or man-made) is widely understood as the enforcement of the Constitutional principle of national solidarity. The Preamble to the 1946 Constitution - quoted in the Preamble to the 1958 Constitution - in fact expressly refers to “*the solidarity and equality of all French people as to the charge resulting from national calamities*”<sup>21</sup>.

As in other countries, personal injuries and property damages caused by catastrophes are not compensated in the same way in France: while personal injuries due to a disaster often fall under the national health and social security system, damages to property are, in most instances, covered by first party insurance. As a result of a series of legislative interventions, private insurance companies may not exclude from first party coverage losses arising out of: (a) natural catastrophes, (b) technological disasters, or (c) terrorism. While the market for first party policies (such as fire policies) is, as a general rule, voluntary in France, most people do in fact take up insurance, especially if they own or rent premises<sup>22</sup>.

### *Natural Disaster Compensation Scheme (CAT NAT)*

Pursuant to article L125-1 of the *French Insurance Code*, insurance contracts, issued to any natural or legal persons other than the State in order to insure against damage caused by fire or any other damage to property located in France as well as damage to hulls of motor vehicles, must also cover against the effects of natural disasters and subsidence of land due to underground cavities<sup>23</sup> or due to Marl-pits on property covered by the insurance contracts. In addition, when the insured is covered for business interruption, the cover must be extended to the effects of natural disasters in accordance with the terms of the corresponding contract.

This regime, established by Law n.82-600 of 13 July 1982 (*Loi relative à l'indemnisation des victimes de catastrophes naturelles*) and forming the basis of the French National Disaster Insurance Scheme (CAT NAT; see below), does not refer to an exhaustive list of natural perils covered, nor does it contain a

complete list of exclusions. The 1982 Law merely refers to the notion of “uninsurable damage”; in particular, the *Insurance Code* states that uninsurable direct material damage, caused by the abnormal intensity of a natural agent, when normal measures have been taken to avoid such damage have been unable to prevent the occurrence thereof or could not be taken, shall be deemed to be a natural disaster.

In any event, the existence of natural disaster must be expressly declared by inter-ministerial decree which shall determine the areas and the periods of the occurrence of the disaster and the nature of the damage. The decree shall state, for each Municipality that has requested the recognition of the existence of a natural disaster, the decision of the Ministers.

According to Article L125-2, a clause in the contract must explicitly state that natural disasters are covered and that coverage cannot be excluded or limited for any of the properties mentioned in the contract. All the insurance contracts mentioned above are deemed to contain such a clause, and any exclusion is considered null and void (Article L125-3). Notwithstanding any provision to the contrary, moreover, the coverage offered includes the reimbursement of the cost of geotechnical studies rendered necessary prior to repairing constructions affected by a natural disaster (Article L125-4).

The *Insurance Code* specifies that some categories of damages are excluded from this mandatory extension of coverage. The following are, in particular, excluded from the CAT NAT regime: damage caused to non-harvested crops, cultivation, soil and livestock outside premises<sup>24</sup>; damage sustained by the hulls of air, marine, lake and inland waterway vehicles as well as goods in transit. The regime does not, moreover, apply to damages caused to real property built and to activities carried out in breach of administrative regulations in force intended to prevent the damage caused by a natural disaster.

Compulsory coverage was extended in 1990 to damage caused by wind during storms, hurricanes and cyclones (Article L122-7 of the *Insurance Code*). This additional coverage applies when no declaration of natural disaster has been issued. However, in the case of wind attributable to a cyclone in respect of which the maximum surface winds recorded or estimated on the damaged area have reached or exceeded 145 kilometers an hour on average over ten minutes or 215 kilometers an hour in gusts, coverage is provided under the CAT NAT scheme, implying that a state of natural disaster has to be declared by inter-ministerial decree.

In summary, the French natural disaster compensation scheme provides for a compulsory extension on all property damage policies purchased on the

voluntary market<sup>25</sup>. It is important to note that, as mentioned, coverage under the catastrophe extension is triggered only when the state of natural disaster is declared by inter-ministerial decree. Moreover, the damaged property must be covered by a "property damage" insurance policy and a causal link must be established between the catastrophe declared in the decree and the damage suffered by the insured property.

The payment of compensation under the French CAT NAT scheme, therefore, is subject to the following two conditions: (a) an official declaration of the state of natural disaster must be issued by inter-ministerial decree; (b) the damaged property must be covered by a insurance policy against fire or any other type of damage (theft, water damage, etc). The natural disaster cover follows the terms and conditions of the underlying first party insurance policy<sup>26</sup>, with the exception of the premium rate and deductibles.

According to the rules of the scheme, the insured parties must retain a portion of the risk, by means of a statutory deductible that cannot be bought back even by means of another policy. Deductibles are compulsory – i.e., they apply even when the basic policy does not include them – and their amount is determined and updated by means of decrees issued periodically by the competent authority.

Since 1 January 2001, a sliding scale has been introduced to vary these deductibles so as to encourage loss prevention measures. This scale applies to those districts which do not yet have a prevention plan for foreseeable natural risks (PPR). A multiplicative coefficient is applied to eligible natural disaster claims located in districts without a PPR for the given peril.

The coefficient is based on the number of declarations (an inter-ministerial decree can contain several declarations) issued in respect of this same peril during the first five years preceding the new decree declaring a state of natural disaster. These coefficients shift, in step-wise fashion, the risk of natural disasters to policyholders as the frequency of natural disasters increases<sup>27</sup>. This sliding scale does not apply when a PPR is set up for the peril in question, but it is reactivated if the PPR is not approved within four years. This scale does not apply to motor vehicles. The deductibles are compulsory, i.e. they apply even when the basic policy does not include them.

The additional premium rates linked to the compulsory catastrophe extension in policies are set by decree. Since 1 September 1999, the rate of catastrophe premiums for property other than motor vehicles has been 12 per cent of the premium or contribution paid for the basic property coverage.

This complex scheme is able to work effectively due to the fact that *Caisse Centrale de Réassurance* (CCR), a state-owned company established in 1946, entered into an agreement with the authorities that allows it to offer reinsurance cover with a government guarantee in the field of natural disasters. CCR does not have a monopoly in natural disaster reinsurance: primary carriers, therefore, are free to seek coverage from the reinsurer of their choice, and may even take the risk of not purchasing reinsurance. In any event, CCR remains the only company within its sector of activity that offers a whole range of reinsurance solutions with unlimited cover. CCR thus provides a guarantee of solvency and security for insured parties within the French natural disaster compensation scheme<sup>28</sup>.

According to current practice, CCR usually offers two types of reinsurance solutions, which are combined to provide two-fold reinsurance cover to primary catastrophe risk carriers. Under the first solution, known as "quota-share", the insurer cedes a certain proportion of the premiums collected to the reinsurer and the latter, in return, undertakes to pay the same proportion of losses. Quota-share reinsurance ensures that the reinsurer follows the fortunes of the insurer, since the latter has to cede a percentage of each of the accounts in its portfolio to the reinsurer. Thus, the risk of anti-selection is avoided. The second solution, known as "stop-loss", covers the portion not ceded on a quota-share basis by the insurer - in other words, the insurer's retention. This is a non-proportional form of reinsurance because, contrary to the "quota-share" system, the reinsurer only intervenes if the total annual losses exceed an agreed figure, expressed as a percentage of the premiums retained. This type of reinsurance enables the insurer to protect itself against the frequency or accumulation risk, i.e. the risk of many claims occurring at the same time. Although most "stop-loss" reinsurance treaties contain a limit of indemnity, CCR's cover in the field of natural disasters is unlimited thanks to the State guarantee from which it benefits<sup>29</sup>. The deductible under the CCR treaty therefore represents the maximum amount which an insurer will have to bear in the course of a single underwriting year, however many losses occur<sup>30</sup>.

Under the *Insurance Code*, the Natural Disaster Central Rating Bureau (*Bureau Central de Tarification des Catastrophes Naturelles*) is entrusted with several regulatory powers with respect to the governance of the CAT NAT scheme. Articles R250-2 and R250-3, for example, lay out the procedure for referring certain controversial matters to the Bureau, such as the refusal to grant coverage by at least two insurance companies and the failure of the insured to conform to the provisions of a disaster prevention plan.

## *Insurance Coverage for Man-made Catastrophes*

### *(a) Terrorist acts*

Pursuant to Article L126-2 of the of the *Insurance Code*, property insurance contracts may not exclude the coverage for damage as a result of terrorist attacks or bombing perpetrated on the national territory. Any clause to the contrary shall be deemed null and void. Article L126-1, in turn, states that the victims of terrorist attacks perpetrated on French national territory and French nationals victims abroad of such same acts may seek indemnification from the government's Guarantee Fund of Victims of Terrorist Attacks and Other Offences<sup>31</sup>. Compensation may be refused or the amount thereof reduced in case the fault lies with the victim.

In order to address the shrinkage in the supply of terrorism risk reinsurance after 9/11, a dedicated terrorism reinsurance pool, named GAREAT, was established in December 2001 (covering risks since 1 January 2002). GAREAT offers reinsurance protection to direct insurers provided that they cede the terrorism risk forming part of all qualifying policies within their portfolio. The French government effectively acts as reinsurer of last resort, offering unlimited protection through the CCR<sup>32</sup>.

### *(b) Technological Disasters*

As a response to the AZF accident of 21 September 2001, involving the explosion of a chemical plant in Toulouse that caused 30 fatalities, 5 000 injuries and the devastation of thousands of buildings, a law was enacted in July 2003 to extend first party insurance coverage to damage caused by industrial catastrophes.

Pursuant to Article L128-1 of the French *Insurance Code*, introduced by Law n.2003-699 of 30 July 2003, when an accident occurs in a hazardous facility, causing damage to a large number of buildings, an official statement by the public administration will recognize the occurrence of a technological disaster<sup>33</sup>.

Article L128-2 states that insurance contracts taken out by any natural person outside his professional activity and covering damage caused by fire or any other damage on property used as dwelling or deposited in premises used as dwelling located in France, as well as damage on hulls of land motor vehicles, must also cover damage resulting from technological disasters affecting the insured property. This cover must guarantee the total compensation of the damage, within the limits, for chattels, of the value declared or the capital



insured by the contract. The insurance company is then subrogated to the rights of the insured against the liable parties, up to the amount of the indemnity paid.

The mandatory extension of coverage does not apply to properties built in areas demarcated by a technological risks prevention plan, unless such properties were built before the publication of the plan; similarly, the mandatory extension of coverage does not apply to properties constructed in breach of administrative rules intended to prevent the damage caused by a technological disaster (Article L128-4).

## GERMANY

The main threats in Germany are from *storms* (gale-force winds in autumn/winter and summer storms with hail and downpours) and *floods*.

To model flood risks, the German insurance industry has developed a “Zoning system for flooding, backwater and storm rainfall” (*Zonierungssystem für Überschwemmung, Rückstau und Starkregen – ZÜRS*). In 2004, ZÜRS was revised and is now divided into four hazard classes, instead of three as previously. The new hazard zone (GK2) represents risks which are threatened by levee breaches, levee overflows or by extreme high water. Buildings that lie in this zone can, in principle, be insured taking account of the individual risk; however, each insurer will have to calculate and make allowance for the cumulative hazard of all his policies in force.

In Germany, insurance is offered on a voluntary basis against damage to buildings and household effects from fire, storm, hail and lightning in the private, commercial and industrial area. Since 1991, following approval by the Federal Insurance Supervisory Office, it has been possible - either as a supplement to building insurance and household effects insurance or as a separate insurance policy - to insure against damage from flooding (high water), earthquake, ground subsidence, landslide, weight of snow, avalanches, volcanic eruption and storm rainfall backflow. Indirect damage from lightning, e.g., so-called voltage surge damage, can also be included in building insurance or household effects insurance policies by supplementary agreement. There is no insurance available against damage from drought, groundwater, or tidal wave.

The rate of insurance coverage for storm damage and fire is, in Germany, very high (insurance against storm damage: about 90 per cent; fire: more than 90 per cent). However, while supplementary disaster insurance coverage is offered for roughly 90 per cent of the inhabited territory, on average only about 10 per cent of household effects insurance policyholders and about 5 per cent of residential building insurance policyholders choose to have this supplementary

coverage included in their policies. The distribution of such insurance across Germany is very uneven, for historical reasons. In Baden-Württemberg about 90 per cent of the insurance policies for buildings include damage from natural forces, since such insurance was compulsory there until the end of 1993. On the territory of the former German Democratic Republic as well, a large number of residential buildings are insured by a so-called GDR building insurance policy, which covers damage to residential buildings by flooding even in areas with a high risk of flooding.

In Germany, natural disaster risks are evaluated in detail using statistically/geographically-based zoning systems and are covered by insurance in accordance with individual insurance companies' own underwriting and rate principles. As risk assessment instruments improve, broader and more refined offer of insurance for natural hazards are cautiously being elaborated. However, this has not resulted so far in any significant changes in insurance density; for instance, for flood insurance, most of the new requests for insurance – in particular, immediately after catastrophes – come from endangered riverbank areas which, for technical reasons, the insurance industry will find it difficult to insure, if at all.

One of the perceived problems in connection with insurance against natural hazards in Germany is the low level of subjective awareness of the risks among the population, which expresses itself in a very low average level of demand and market penetration. It can be observed that even after quite major catastrophes, people soon return to their accustomed “daily routine” and thoughts of hazards and precautions recede into the background. In light of this, it is possible to state that while there is no problem with the supply of insurance services in Germany, there is a problem with demand.

In the field of prevention, the federal structure of responsibilities in Germany poses a further problem, in addition to public risk awareness, in terms of trying to implement effective prevention measures. Thus, for example, in the context of the *Flood Prevention Law* passed in 2005, it proved impossible to do much in the way of tightening riverbank use restrictions or raising construction standards, since such issues are predominantly the responsibility of the *Länder*, whose regulations differ widely.

While it is not possible to make a general statement as to whether insurance companies, when calculating premiums, take into account additional preventive measures taken by the customer to reduce risks, property and casualty insurers have, through their trade associations, developed some (non-binding) technical pointers for consumers or are continuing to work on them. Some insurers, in co-operation with suppliers of meteorological data, offer their

customers a storm warning service via mobile telephone which notifies a policyholder as soon as the weather changes in a way which could pose a threat to his particular area of risk, so that appropriate precautionary measures can be taken.

There are no special insurance regulatory rules regarding the establishment of reserves for the purpose of providing for catastrophic risks. That said, applicable rules require an insurance company to set aside reserves to compensate for fluctuations in the amounts of claims in coming years (claims equalization reserves); such reserves benefit from favorable fiscal treatment under certain conditions.

Germany has, in some cases, provided *ex post* compensation to victims of specific disaster events<sup>34</sup>. For instance, in the aftermath of catastrophic flooding in August 2002, a special fund was set up to provide some limited preliminary financial assistance to victims of the disaster. With respect to private losses, businesses and individuals who suffered flood damages were eligible to receive financial assistance insofar as they could not receive compensation from insurance companies, or other third parties<sup>35</sup>. The fund was specifically designed to provide compensation for property damages.

After the severe damage caused by the catastrophic flooding in August 2002, there was a public discussion in which those *Länder* hardest hit were calling for compulsory insurance for Germany. As a result of an extensive research into the subject undertaken by the federal government and the *Länder*, in which the advice of the insurance industry was sought as well, the governmental authorities finally determined that, in view of the large number of legal, financial and fiscal factors, no adequate solution could be found, and therefore decided not to proceed with plans to introduce compulsory insurance for protection against natural catastrophes.

As concern terrorism risks, a specialist insurance company was established in Germany in September 2002, called EXTREMUS Versicherungs-AG. EXTREMUS has a share capital of EUR 50 million writing only terrorism business and it benefits from a limited guarantee offered by the German State<sup>36</sup>. Only risks located in Germany with a total insured value (property damage and business interruption combined) of at least EUR 25 million are eligible for coverage by EXTREMUS. The program is capped at annual aggregate of EUR 10 billion.

## HUNGARY

The experience of the past few years shows that, as far as natural disasters are concerned, Hungary is most exposed to **flood** risk. In particular, the regions surrounding the Tisza river are considered to be the riskiest and most vulnerable areas.

Legislation adopted in 2003 established a Fund for Flood and Inland Water Compensation (*Wesselényi Miklós*) and regulated compensation for flood damages. Individuals who own real property in risky regions of Hungary pay contributions to the Fund and, based on these contributions, are entitled to indemnification in case of loss. The Fund is co-financed by government budgetary support if it lacks enough sources to fulfill its obligations.

## ICELAND

Iceland is prone to considerable losses from **earthquake** and **volcanic risk** and, to a lesser extent, from **floods**, **avalanches** and **windstorm**. The capital area of Reykjavík has the greatest potential exposure due to the concentration of population and property but is not in a major risk area for the main perils of earthquake and volcanic eruption.

The Civil Protection Department of the National Commissioner of the Icelandic Police is in charge of risk assessment and monitoring as regards safety of the population. Sophisticated monitoring is employed by the State Meteorological Bureau, which runs an early warning and information system for seismic and volcanic risk as well as for avalanche risk in liaison with local authorities. Risk modeling techniques are employed by the Civil Protection Department and Iceland Catastrophe Insurance for earthquake risk (South Iceland Model) and other risks.

The Civil Protection Department and regional Civil Protection Units are engaged in contingency planning for many types of perils but primarily in respect of snow avalanches, earthquakes and volcanic eruptions as these are the greatest threat to public safety. Specific efforts have been made to assess such “out of the box” or extremely unlikely events as tsunamis which have been considered to be extremely unlikely events.

Regulatory measures that have been taken for prevention and mitigation purposes include: strict building codes (earthquakes and wind loading); land use measures for snow avalanches, warning systems for earthquake, volcanic eruption, and snow avalanches; barriers against snow avalanches and floods;

hazard mapping; and awareness programs, for instance for earthquake and volcanic risks.

Major catastrophe risks are handled by a publicly owned company called Iceland Catastrophe Insurance (ICI), thus minimizing the involvement of private insurance markets in catastrophe lines. This state-owned corporation established in 1975 under the *Iceland Catastrophe Insurance Act*, functions as a special purpose insurance company that provides insurance coverage against the following disaster risks: volcanic eruptions, earthquakes, landslides, snow avalanches, and floods. All owners of fire-insured property (fire insurance of houses is compulsory) and related contents in Iceland - whether individuals, corporate entities, or state and public bodies - are insured. Since 1982 so-called “lifelines” are also covered by ICI even if they are not insured against fire: geothermal heating systems; waterworks and sewage systems owned by municipalities or the National Treasury; harbor installations owned by municipalities and the National Treasury; permanent bridges of 50 meters or longer; electric installations, including distribution systems, dams and transformer facilities that are publicly owned; telephone systems and communications networks that are publicly owned; and ski lifts. ICI does not cover windstorm risks which are covered by homeowners’ insurance and some all-risk programs, including all-risk automobile insurance.

Buildings are insured according to their valuation for fire. There is a deductible of 5 per cent for each loss. Policyholders are only insured against direct losses resulting from the above-mentioned catastrophes. Structures that are erected in violation of a regulation or order set by the authorities, or which violate the provisions of enacted law in a manner which can be deemed to make them more susceptible to incurring damage from natural catastrophes, are not deemed to be insured against catastrophes, irrespective of whether they are insured against fire.

Premium rates are 0.025 per cent for residential and commercial property and contents; and 0.02 per cent for lifelines. Fire insurance companies collect the premiums for ICI. ICI is liable, for each individual event, for up to 1 per cent of total insured capital at the time of the loss event. Should the total of payable claims in Iceland exceed this amount, the claims of all of the insured are proportionately reduced. There is no trigger for compensation aside from the occurrence of the event itself. Indeed, ICI makes no distinction, in terms of its catastrophe insurance coverage, between a loss for a single individual person and losses flowing from a national-level disaster.

ICI reinsures its exposure on the global market. To meet its liabilities ICI may obtain a loan and, under the *Iceland Catastrophe Insurance Act*, the State Treasury is required to guarantee such loan.

Given the presence of ICI, catastrophe losses have not impacted private insurance markets. Moreover, ICI has not been adversely affected by recent disaster events; indeed, it has not needed to call on its reinsurers in any event since its founding in 1975. Separately insured windstorm losses are as a rule not severe due to the wind loading of buildings in a country that is used to stormy weather.

ICI is permitted under the *Iceland Catastrophe Insurance Act* to grant funds to subsidize research and projects that are meant to ward off damage caused by natural catastrophes. ICI is further empowered to grant funds for the education and training of national relief organizations that have entered into an agreement of cooperation with the Civil Defense Authority on disaster relief work. Total grants each year may not exceed 5 per cent of the gross written premiums of the previous year.

In terms of *ex post* provision of government disaster compensation, separately from any ICI insurance payments, the government of Iceland has assisted with temporary housing and provided compensation for some business interruption, relocation and so on.

Post-disaster reviews have been conducted after major events such as the snow avalanches of 1995 and the earthquakes of 2000 where the performance of various agencies was assessed. These reports are not available in translation. After the avalanches, it was found that earlier hazard mapping and measures were inadequate and that recent build-up in the affected areas was found to be in hazardous areas with fatal effects. As a consequence, the whole system was overhauled and a special avalanche fund set up to deal with mitigation measures. A special government appointed committee reviewed the performance of Iceland Catastrophe Insurance after the 2000 earthquakes.

## ITALY

According to a report published by the European Environment Agency (EEA) in 2004, Italy ranks very high among the 31 EEA member countries in terms of overall exposure to natural disasters<sup>37</sup>. In particular, Italy is especially vulnerable to **floods, landslides, earthquakes, forest fires, volcanic eruptions** and **drought**. Up to 40 per cent of the Italian population lives in seismic areas where 64 per cent of buildings are not constructed according to anti-seismic rules and where over 120 000 people died for earthquake-related causes in the

last century<sup>38</sup>. Almost two million people are exposed to volcanic risks in Italy, where there have been as much as 5 400 floods and 11 000 landslides and avalanches over the past 80 years. Victims of hydro-geological risks in the last 50 years have reached 3,500, while the overall costs for natural disasters in this country have been estimated at approximately EUR 100 billion in the last two decades<sup>39</sup>.

From the point of view of Italian citizens, catastrophes — whether they be natural or caused by man — are events that generate a strong expectation of state intervention and aid. The traditional Italian idea of the state, which developed in the last century and especially after World War II (state based on the principle of solidarity, fully recognized in Article 2 of the Italian Constitution), brings people to rely upon the state for any unexpected, unaffordable, unbearable matter, which implies that persons expect government intervention as a right and demand full restoration of damages whenever a disaster occurs. This expectation is cumbersome for the state in terms of costs<sup>40</sup>.

In Italy, man-made catastrophes can most often be classified as torts or crimes and thus fall under the related legal qualifications and proceedings<sup>41</sup>. However, although victims will seek recovery from the alleged wrongdoers, they will equally be expecting the state to provide some sort of compensation for the damages occurred<sup>42</sup>.

The state on its part never spared its aid in this respect: according to available statistics, in the last 10 years the government has spent over EUR 35 billion for damages caused by natural catastrophes, and yearly expenses are progressively growing. The compensation of disaster losses is handled on a case-by-case basis, whereby the Italian government intervenes in emergencies by providing *ex post* financial aid and enacting *ad hoc* laws (so called emergency legislation).

In most cases, state indemnification of disaster losses follows a routine procedure. Whenever a natural catastrophe involves a given area, the local government proposes a declaration of state of emergency for that particular area, which may involve the territory of a town, of a province or of an entire region according to the extent of the disaster. The Italian Cabinet must approve the proposal in order for the state of emergency to be officially declared. Approval opens the way to government intervention. The state of emergency may be very well declared for all sorts of man-made and natural catastrophes affecting the population, public and private property and the environment.

A relevant share of the state's yearly budget is devoted to restoring damages incurred as a result of catastrophes. In the absence of a well organized

set of rules of reference and legal guidelines, state funding is basically inspired by provisions aimed at covering emergency situations connected to specific, unexpected disastrous events, so that *ad hoc* provisions are enacted that vary over time and are highly discretionary. Unexpected, concentrated and extremely exorbitant expenses have often been granted without there being any prevention plans to avoid future similar disasters<sup>43</sup>. At the same time, the enactment of special laws and provisions indemnifying the owners of properties affected by single disasters have generated a level of reliance on the government, as individuals and businesses count on the government for recovery, which may explain why private insurance covering natural disasters has never fully developed in Italy.

In Italy, insurance coverage of risks related to natural catastrophes is and remains basically limited to private insurance stipulated on a voluntary basis. At present, this kind of insurance coverage is fairly infrequent and it mostly concerns the industrial sector, covering devices, machineries, installations and ancillary services.

To address this situation and to reduce government expenses, several proposals to develop a more efficient model have been presented and debated. Some stakeholders have argued that governmental expenditures in this field could be thoroughly reduced should an insurance mechanism covering losses from natural disasters be introduced, on the basis of a partnership between the public and private sectors.

In 1996 ANIA, the National Association of Insurance Companies (*Associazione Nazionale fra le Imprese Assicuratrici*) drafted a plan to develop flood maps covering the entire Italian territory<sup>44</sup>. Although it was limited to flood-related issues, the plan divided the Italian territory into areas of low, medium and high risk of flood and identified six thousand towns particularly subject to floods. By means of this study, ANIA suggested that a system providing insurance coverage against natural catastrophes should be preceded by a careful evaluation of actual risks in relation to the Italian territory.

In 1999, the government presented a bill intending to address the issue of natural catastrophe insurance. The draft authorized the government to enact provisions regulating insurance covering natural catastrophes. The rules were based on the French CAT NAT scheme; the draft legislation would have required fire insurance policies to include coverage of natural catastrophes (also following the Norwegian approach), though it was characterized by several peculiarities. In order to promote demand for insurance coverage, the draft legislation would have ensured that all victims of natural catastrophes were indemnified for the first five years from the enactment of the law regardless of



the fact that they had or had not sought insurance coverage against natural catastrophes. However, after this initial 5-year term, the draft legislation provided for a limitation (from 30 per cent to 60 per cent) of state compensation to private victims of disasters whose assets were not covered by insurance against natural catastrophes. The 30-60 per cent range depended upon the economic status of the victim hit by the disaster. This would have led to a general increase of insurance policies (and related amount of tax revenues) in the fire/disaster field, and a general increase in the number of persons and entities insured. The establishment of consortiums grouping insurance companies would have been permitted, but only for the purpose of facilitating catastrophe reinsurance.

Insurance premiums would have been determined by the government according to the different areas of risk, and would have been published by the Ministry of Industry based upon an initial average premium defined by the market. Furthermore, the draft legislation provided for a premium cap for disaster coverage (no more than 50 per cent of the premium for fire coverage). This provision was highly criticized because establishing premiums and insurance policy terms and conditions common to all insurers was and is contrary to existing Italian and European rules on competition.

The antitrust authorities expressed concerns regarding the extension of fire insurance policies to natural disaster risks, claiming that this linkage would affect competition in the fire insurance business<sup>45</sup>. Furthermore, there was a concern that by grouping fire insurance (i.e., a non-regulated market) and natural catastrophe insurance (i.e. a market subject to specific regulation), the fire insurance market would inevitably be affected by the proposed restrictions on competition intended to facilitate natural catastrophe insurance coverage. The authorities also held the view that while adopting an alternative state-led solution, i.e., an entirely *mandatory* insurance system covering natural disasters, would ensure a widespread collection of premiums, it could lead the community to interpret the new compulsory insurance as an indirect form of taxation<sup>46</sup>. The draft was never approved by Parliament, but led most political parties to agree on the need for reform in the natural catastrophe field.

In 2003, ANIA proposed to include in the Financial Law for 2004 a set of rules establishing a risk partnership between government, the insurance market and the insured parties. The reform would have provided for the compulsory extension of fire coverage to coverage for catastrophes. The law would have given a full definition of the term 'catastrophe' and a list of catastrophes to which the law would have applied. The reform would also have provided for risk differentiation, and for specific, clear parameters to determine the value of the assets damaged by the disaster. Deductibles would have been defined in

detail, together with compensation limits. Finally, the law would have regulated and implemented the establishment of a co-reinsurance pool between insurers, providing for general yearly limits to the pool's aggregate exposure.

Soon after the government announced that it intended to regulate insurance coverage of natural disasters by implementing a mixed system in compliance with applicable competition rules and regulations and existing insurance legislation. Following ANIA's suggestions, the government intended to include provisions regulating natural disaster insurance coverage in the Financial Law for 2004. The proposed provisions were very similar, if not almost identical, to ANIA's 2003 proposals.

The text provided for a compulsory extension of natural catastrophe insurance coverage to all and any new fire insurance policies entered into by private businesses and individuals after the enactment of the new law, with a gradual extension to all previously existing fire insurance policies. Insurance coverage under the mandatory catastrophe extension would be triggered by the Cabinet's declaration of state of emergency. There would have been detailed parameters of reference determining the value of goods and assets damaged by natural catastrophes and unauthorized buildings would not have been entitled to any form of compensation. Insurance premiums would have been defined also on the basis of different risk indexes characterizing different areas, thus encouraging a system based on deductibles and indemnification limits. The legislation would have implemented a strict definition of catastrophes and excluded state indemnification for any buildings and assets not covered by insurance. It would have also established a system of co-reinsurance through a co-reinsurance consortium or pool grouping insurance companies and responsible for the collection of premiums paid for natural catastrophe risk coverage. A cap would have been introduced on the co-reinsurance consortium's yearly aggregate exposure, beyond which the state would have covered any residual compensation, including any amounts paid to non-insured victims of natural catastrophes.

The legislation was never approved as it did not find full acceptance by all political parties involved in the elaboration of the Financial Law for 2004. Opponents argued, in particular, that the introduction of a semi-compulsory insurance mechanism disguised a new tax on housing. Moreover, the Italian antitrust authority voiced another negative opinion on the draft<sup>47</sup>. The authority was concerned especially with the provisions calling for: (i) compulsory extension of catastrophe coverage to all fire insurance policies (assuming that it would constitute an illegitimate *tie-in*)<sup>48</sup>; (ii) strict regulation of the terms and conditions of coverage; (iii) mandatory participation of all insurers in a single co-reinsurance pool; (iv) minimum pricing mechanisms. Apart from the detailed

reasons that may support the negative outcome of this opinion, the Italian antitrust authority seemed to be in principle against the idea of a public/private partnership in the management of catastrophe risks<sup>49</sup>.

Financial legislation drafted in 2005 reintroduced the concept of a public-private system involving insurance companies in the coverage of natural catastrophe losses. Legislation passed at the end of 2004 stated that, with a view to fostering the development of a voluntary market for natural catastrophes insurance, the government would contribute a share of the capital dedicated reinsurance company, thus enhancing the reinsurance capacity of the market and supporting a consortium of primary insurers. The plan created a guarantee fund with a 2005 endowment of EUR 50 million, to be managed by Consap SpA (*Concessionaria di servizi assicurativi pubblici*). Notwithstanding the deadlines established by the law, the implementing regulations governing the setup of the new reinsurance company, together with rules pertaining to fund operations and the measures aimed at favoring the development of the voluntary market for natural disasters insurance, have never been approved.

## LUXEMBOURG

In terms of natural perils, Luxembourg is mostly exposed to *floods*, *storms*, and *hailstorms*. Different preventive measures have been taken by the authorities in relation to country planning and regional development: for example, dykes and retention basins have been constructed. There is no national agency in charge of risk assessment and monitoring.

Catastrophic risk insurance is marketed on a voluntary basis in this country, where there is no national scheme to compensate losses due to disasters. Insurance coverage of storm risk is almost systematically included in multi-peril property insurance policies taken out by private citizens and the current penetration rate is quite high (roughly 80-90 per cent of the population and 70-80 per cent of businesses are insured against storm). On the other hand, coverage of flood risk still remains very rare (5 per cent penetration rate). Premiums are not linked to the level of prevention measures taken by the policyholder. Storm and flood risks located in Luxembourg are reinsured on the international market. There are no specific regulations or incentives regarding catastrophic risk reserving by insurance companies.

## JAPAN

Due to natural geographical, topographical and meteorological conditions, Japan is subject to various disasters, for example *earthquake*, *typhoons*, *tsunami*, *volcanic blast*, *torrential rain*, *heavy snowfall*, *flood* and *landslide*.

Since Japan is subject to a recurrence of natural disasters, the Japanese *Building Standard Law* defines minimum standards concerning the siting, construction, equipment, and use of buildings. In addition, the *Housing Quality Assurance Act* establishes a standard for the quality of a house and a related evaluation system. The Headquarters for Earthquake Research Promotion is in charge of risk assessment and monitoring of earthquakes. Risk modeling techniques are widely developed and used in the insurance market.

The *Disaster Countermeasures Basic Act* was passed in 1961 to establish consolidated measures for a more systematic prevention of disasters and to promote a consistent approach at national level. In 1962, permanent legislation concerning special aid provided in the context of disasters was passed (Law concerning Special Financial Aid in Case of Severe Disaster). The passage of these two laws established and reinforced the system for coping with disasters.

Under the *Disaster Countermeasures Basic Act*, the Central Disaster Management Council, chaired by Prime Minister of Japan, establishes the national Basic Disaster Management Plan<sup>50</sup>. This Plan provides the foundation of contingency planning and outlines basic policies on establishing disaster prevention schemes, facilitating prevention programs, expediting and optimizing emergency restoration and promoting research, science and technology that are relevant to disaster prevention and emergency response. Based on this Plan, designated administrative agencies and institutions develop a Disaster Management Operation Plan, while local municipal entities develop a Local Disaster Management Plan. In addition, against envisaged giant earthquakes, the Plan provides for *General Principles Regarding Countermeasures for Earthquakes* and the *Guidelines for Emergency Activities for the Prevention of Earthquake Disasters*.

In addition, the *Disaster Countermeasures Basic Act* requires that the government take all necessary financial measures to achieve its objectives. Accordingly, when a disaster occurs, the Financial Services Agency keeps in close contact with relevant financial institutions and requests insurers to take measures concerning claims management when deemed necessary, according to such factors as local conditions and financial needs. The *Disaster Countermeasures Basic Act* and other laws relevant to disaster management implement various disaster contingency planning such as indemnification, financing and tax exemptions. Drawing on the enormously disastrous experiences on the Great Hanshin-Awaji Earthquake in 1995, the *Disaster Countermeasures Basic Act* was amended and various measures against disasters were strengthened.

According to the Japanese authorities, key challenges relating to disaster risk prevention and mitigation include, for large-scale earthquakes, seismic retrofitting of existing buildings, the preparation and dissemination of a “tsunami hazard map”, and the encouragement of disaster-prevention activities undertaken by business sector. For windstorm and flood, key challenges include ensuring the rapid distribution of information and evacuation of the elderly.

### *Japanese system of earthquake insurance*

With Japan suffering periodically from giant earthquakes and the frequency and damage attributed to them being without parallel in any other country, insurance and reinsurance companies are significantly exposed to earthquake risk.

Insurance for natural disasters is not mandatory in Japan. However, with respect to earthquake insurance, it is, in principle, incidental to fire insurance for residences covering buildings for residential use or movables for living. Residential policyholders can purchase earthquake shock and fire-following insurance from local insurance companies. Coverage is added by way of endorsement, and an additional premium is payable. Policyholders who purchase fire insurance policy for residential buildings, but do not wish to purchase earthquake insurance, are required to submit written consents. Since earthquake coverage is relatively expensive and its purchase is not mandatory, the penetration level remains quite low<sup>51</sup>.

Since private non-life insurance companies would find it difficult to pay insurance claims on their own account only when seismic damage is heavy and there is a large amount of losses, the government provides coverage for damages in excess of certain threshold amounts. This system of earthquake reinsurance covering residential properties has been in place since 1966. The *Earthquake Insurance Act* entered into force in that year and has been reformed several times since its enactment<sup>52</sup>. In accordance with the promulgation of this law and following the launch of sales of earthquake insurance for residential properties to be written in conjunction with dwelling and shop owners’ comprehensive insurance policies, the Japan Earthquake Reinsurance Company (JER) was established by 20 domestic non-life insurance companies. Under the Japanese earthquake reinsurance program, primary carriers sell earthquake policies with large deductibles on the voluntary market (insurers are obliged to offer the optional earthquake coverage with all residential fire insurance policies, but policyholders may decide not to purchase it) and then fully reinsure their risk with JER, which, in turn, retrocedes part of the risk to the Japanese government (approx. 50 per cent), and part of it to the private insurance market (approx. 20 per cent)<sup>53</sup>.

Under this system, the aggregate limit of indemnity for earthquake insurance liabilities (JPY 5,500 billion, since 1 April 2008) is shared by the private and public sectors as follows: for earthquake insurance liabilities up to JPY 110 billion: the JER is liable for 100 per cent of insurance claims; over JPY 110 billion and up to JPY 1,730 billion, the government is liable for 50 per cent while the JER and private insurers (due to retroceded risk from the JER) are liable for 50 per cent; and from JPY 1,730 billion to JPY 5,500 billion, the government is liable for 95 per cent and private insurers (including the JER) are liable for 5 per cent. Under the *Earthquake Insurance Act*, where earthquake insurance liabilities for one event exceed the indemnity cap of JPY 5,500 billion, residential policyholders' claims are reduced proportionately.

Under this state-led system of earthquake insurance, policyholders can obtain earthquake coverage of residential buildings and household property in the amount of 30 to 50 per cent of the sum insured under the fire policy. The amount insured for earthquakes is limited to a maximum of JPY 50 million for a building and JPY 10 million for household property. Policy conditions are identical for all non-life companies. The insurance premiums collected by insurers do not remain with the insurers but are managed and operated by the JER and the government<sup>54</sup>.

Under the *Law concerning the Non-Life Insurance Rating Organization of Japan*, risk premium rates are calculated by the Non-Life Insurance Rating Organization of Japan (NLIRO). The NLIRO computes earthquake risk premium rates by computing the estimated insurance claims to be paid per year using the data from damage estimation simulation taking into consideration approximately 400 destructive earthquakes that have occurred in the past 500 years. Premiums are linked to the level of prevention measures. For example, the application of different rates depends on the material used in the building (wood or non-wood). Special discounts are also applied according to construction age and the installation of particular quake-resistance structures. Premium rates include a "loading rate" for non-life insurance company expenses and agency commissions<sup>55</sup>.

A new premium tax deduction system for earthquake insurance has been introduced as a means to promote self-reliant efforts of individuals to prepare for earthquakes. Under this scheme, individuals can deduct the amount of premiums paid from their income. The maximum deductible amount is JPY 50 000 under the Income Tax Law and JPY 25 000 under the Local Tax Law.

The General Insurance Association of Japan ("GIAJ") conducts various activities, such as public relations activities, to raise public awareness on, and promote earthquake insurance.

## MEXICO

Due to its geographical position, Mexico is exposed to different kind of natural disasters, such as *tropical storms* that cause severe floods as well as *soil and mud avalanches* affecting coastal and rural zones of the country. As well, Mexico is located in an intense *seismic* and *volcanic* region. The vulnerability of the country is diverse due to its natural and social characteristics. The magnitude of the damages produced by these natural disasters depends on the vulnerability level of the populations: the risk of catastrophic losses is greater for those populations with deficient urban planning, riverbed settlements or within reach of volcanoes.

The Mexican government provides the conditions for the management of major risks. Accordingly, public authorities are responsible for the safeguarding and protecting of the civilian population against such events. Government actions may include the protection of the population at risk and reduction of damage through mitigation regulations. In some cases, such as volcanic eruptions, hurricanes or other possible catastrophic events, public authorities must highlight the threats and promote risk awareness among the population.

The country has emergency plans at the local and federal levels to address natural disasters and which involve collaboration between civil society, governmental and military institutions. The National System of Civil Protection (SINAPROC) and the National Center of Disasters Prevention (CENAPRED) were created as a result of the consequences of the major earthquake in Mexico City in 1985. Their objective is to prevent disasters, provide alerts and develop a culture of self-protection and reduce the populations' risk against natural catastrophes and man-made disasters through research, inspection, training, and diffusion of information. The National System of Civil Protection, established on 12 May 2000, is a group of structures, methods, and procedures established by public sector organizations, with the support of state and municipal authorities and private and social voluntary groups, for the coordination of actions relating to disaster prevention and recovery. The System includes the President of Mexico, a National Council for Civil Protection (chaired by the President), departments and agencies of the federal public administration, CENAPRED, voluntary, local and nongovernmental groups, and federal and municipal civil protection systems. It also includes financial mechanisms such as FONDEN and FOPREDEN<sup>56</sup>.

The National Seismologic Service (*Servicio Sismológico Nacional*, SSN) of the Institute of Geophysics of the Universidad Nacional Autónoma de México (UNAM) provides information on the occurrence of earthquakes within the national territory, as well as information necessary to improve the

populations' capacity to evaluate and prevent seismic and volcanic risk. It also develops studies, elaborates models, and monitors seismic and volcanic activities in Mexico.

In general, private entities have diverse programs of prevention against the possible occurrence of natural disasters, adapted to the particular conditions of each company. Nevertheless, the National System of Civil Protection contemplates the need for the development and consolidation of *Internal Programs of Civil Protection* in all business entities, and has issued *Technical Directives for the Production and Instrumentation of Internal Programs of Civil Protection*. Such guidelines recommend compliance with the Mexican Norm of Signals and Warnings for Civil Protection, which serves to specify and harmonize the characteristics of the signaling system for disasters. The Norm allows people to identify information for prevention, precaution and obligation messages, so that they can correctly act under certain situations.

The aftermath of a natural disaster is carried out with the participation of the private sector in the mitigation of its effects, basically through two schemes. On the one hand, there are the contributions of nongovernmental organizations, such as the Red Cross and other non-profit entities that mainly compile the contributions destined to assist the affected population. On the other hand, the private insurance sector pays the indemnities for the casualties inflicted by the natural disaster under the corresponding insurance contracts<sup>57</sup>.

There are no fiscal incentives for policyholders to purchase insurance for catastrophic risks. The 1986 report of the National Commission on Reconstruction, which provided the basis for a new national system of civil protection in Mexico, considered it necessary to establish, by stages, regions and population segments, a financial fund and an insurance system to grant economic protection to those exposed to natural disasters. It is important to note that the concept of catastrophic insurance coverage was adopted only as a recommendation and not as a binding obligation on the government for adoption<sup>58</sup>.

The relatively low penetration level of earthquake and other catastrophic risks coverage limits the risk of insolvency of Mexican insurance and reinsurance companies in the aftermath of disasters. Insurance undertakings are required to constitute an unearned premium reserve (including an earthquake and other catastrophic risks reserve), an outstanding reserve, and other reserves, benefiting from favorable tax treatment under certain conditions. Insurers must currently take into account, for the constitution of the unearned premium reserve, a specific methodology for the calculation of the part that is destined for the coverage of catastrophic risks. In addition, applicable regulations



establish an obligation to constitute (or increase) a special reserve for catastrophic risks relating to earthquakes and/or volcanic eruptions, as well as a special reserve for catastrophic risks relating to hurricanes and/or other hydro meteorological risks.

The Mexican authorities acknowledge that a key challenge is that even though governmental and private organizations work to prevent and mitigate risks, a lack of financial culture related to the prevention of catastrophic risks exists among the whole population. The authorities have noted that it is important to point out the relevance of the promotion of an insurance culture among population as well as social awareness of the possible occurrence of catastrophic risks. These initiatives have improved the level of penetration of the insurance sector in relation to the whole economy providing a basis for a solid and consistent insurance market, as well as protecting the population.

### ***Natural Disasters' Fund (FONDEN)***

The Natural Disasters' Fund (FONDEN) is a financial mechanism created by the federal government in order to provide financial support, in a complementary manner and within the limits of its resources, for emergency and natural disaster events. Likewise, the Natural Disasters Prevention Fund (FOPREDEN) was created to provide resources for actions and as a mechanism to prevent and reduce risks, as well as to avoid and reduce the negative impact effects of catastrophic natural disasters.

The participation of the public sector takes place only when an official declaration of emergency or natural disasters is executed by the Natural Disasters' Fund (FONDEN). For the recovery of public infrastructures, forest resources, protected natural areas, coastal zones, riverbeds and lagoons, archaeological, artistic and historical patrimony, as well as in the assistance of disaster victims, the resources of the FONDEN Program are complementary to the resources of federal entities. The resources of the FONDEN are public and the Ministry of Government in the preparation of the budget, accounting and federal public expense law includes the resources for the Natural Disasters' Fund in the corresponding project of the Federal Expenditure Budget.

The types of disaster in relation to which the Ministry of Government can issue a Natural Disaster's Declaration in order to access to the FONDEN resources are: (a) geological (earthquake; volcanic eruption; avalanche; tidal wave; landslide); (b) hydro meteorological (atypical drought; cyclone - in its different manifestations: tropical depression, tropical storm and hurricane -, extreme rains; snowfall and hailstorm; atypical floods; tornado); and (c) others (forest fire).

In May 2006 the Mexican government issued a parametric catastrophe bond to cover certain financial consequences of catastrophic earthquake risks (transaction value: USD 160 million). The transaction provides catastrophe cover to the Mexican government for financing emergency costs if an earthquake of moment magnitude 7.5 or 8 hits regions near Mexico City or along the Pacific Coast. The cat bond was sold to institutional investors in the United States and in Europe and it was part of a larger transaction combining securitization and reinsurance instruments to the benefit of FONDEN<sup>59</sup>.

## NETHERLANDS

During the past decade, the Netherlands has been hit by different types of natural and man-made catastrophes, including an *earthquake* in Southern Limburg, *flooding* in the south-eastern part of the country and the explosion of the fireworks factory in Enschede.

*Flooding* is the most important natural peril in the Netherlands, where the purchase of natural disaster insurance by the population or by corporate entities is not compulsory. Flood risk has never been covered by private insurance in the Netherlands and citizens have received compensation from the government on an *ad hoc* basis.

With only storm risk being covered in existing policies, insurance and reinsurance companies are not highly exposed to natural disaster risks. Insofar as catastrophic risk is covered in insurance policies, normal insurance regulation applies. The coverage of catastrophic risks by insurance and reinsurance companies, in other words, is based on normal insurance principles and there are no special fiscal incentives regarding catastrophic risk reserving in the Netherlands.

After several years of intense political debate, in 1998 the *Calamities Compensation Act* (WTS) on compensation of damages in case of catastrophes and large accidents was passed with a view to providing a more structured response to the compensation of victims of disasters. The WTS of 1998 covers non (commercially) insurable property losses due to fresh water floods and earthquakes that are considered catastrophes under the law and it has a subsidiary character. A Royal Decree must be issued for the WTS compensation system to be applicable to a specific disaster event<sup>60</sup>.

The association of insurers in the Netherlands has a catastrophe contingency plan (*rampenplan*). The contingency plan includes a special plan for loss assessment and claim management in the aftermath of disaster. An example of the operation of this special plan was the loss assessment and claim

management performed following the large damages resulting from the fireworks explosion in Enschede.

After the flooding in Limburg and Wilnis and the explosion in Enschede evaluations of disaster management practices and of the WTS were performed. In general, it was concluded that the management of disasters ('rampenplannen') functioned reasonably well but that improvements could be made. One of the conclusions of the evaluation of the WTS was that the sense of personal responsibility and private insurability should be stimulated.

The Netherlands Reinsurance Company for Terrorism losses (NHT - *Nederlandse Herverzekeringsmaatschappij voor Terrorismeschaden*) is a dedicated reinsurance company writing terrorism risks. In 2003 a "Terrorism Cover Clause", was added to all new and/or amendable policies providing for overall terrorism exposures to be limited to EUR 1 billion per year. Participating insurers are charged for the reinsurance premium and, once having decided to become a member of the NHT, they are deemed to cede all their terrorism exposure to the pool. Pursuant to an agreement with the government, if needed, emergency legislation will restrict terrorism exposures in non-amendable life insurance policies to conform to the overall NHT exposure limit of EUR 1 billion.

## NEW ZEALAND

As a country on the Pacific Ring of Fire and in the Roaring Forties of the Southern Ocean, New Zealand is seriously at risk from ***storms (wind damage, river flooding and storm surges), volcanic events, major earthquakes tsunami, and landslides.***

New Zealand has a National Civil Defence Emergency Management Plan that replaced the previous National Civil Defence Plan. It was approved by Cabinet in November 2005 and became operational in conjunction with the *Guide to the National Civil Defence Emergency Management Plan* on 1 July 2006<sup>61</sup>. The plan was developed by the Ministry of Civil Defence and Emergency Management (MCDEM) and key stakeholders including representatives from CDEM Groups, local authorities, emergency services, government agencies, and lifeline utilities, and was made pursuant to sections 39(1) and 45(b) of the *Civil Defence Emergency Management Act 2002*. The purpose of the Plan is to state and provide for hazards and risks to be managed at the national level and to have the necessary arrangements to meet these hazards and risks. The Plan also provides support to the management of local emergencies. The Plan gives effect to the principle of supporting the management of and recovery from emergencies in the community and provides

the framework for support from the national level to the regional level and then local level.

Under the *Civil Defence Management Act*, it is the responsibility of CDEM groups (consortia of local and regional councils) to identify, assess and manage the hazards and risks in their region. It is also their responsibility to identify and implement cost-effective risk reduction measures. The MCDEM and other departments support CDEM groups and councils in these activities. The MCDEM has developed an education programme for use in schools and has engaged in a public education campaign.

The assessment of hazards and consequent risk, and related monitoring, are primarily a CDEM group responsibility. However:

- GNS Science, a New Zealand government-owned research organisation, monitors seismic and volcanic risks;
- Under the *CDEM Act*, the Director, Civil Defence Emergency Management, is supposed to identify hazards and risks that he considers are of “national significance” (as defined in the *CDEM Act*). MCDEM is currently considering how best to advance that work; and,
- Other departments are responsible for assessing other types of risk, e.g., the Department of Building and Housing and the risks posed by different types of housing.

The National CDEM plan makes reference to warning systems. The Plan contains some of the relevant regulations affecting emergency services, lifeline (infrastructure) services, and welfare organizations. CDEM groups are responsible for disseminating warnings to their local public.

In terms of financial compensation or assistance, other relevant departments include MSD (financial support to households), MAF (adverse events programme), Treasury which looks after the legislation controlling the Earthquake Commission, and Land Transport New Zealand (which provides substantial road repair subsidies). In terms of remaining shortfalls and problems regarding risk prevention and mitigation in your country, the New Zealand authorities indicated that there are no legal powers to move people from at-risk sites unless a specific event is very imminent.

## *Earthquake Commission (EQC)*

The Earthquake Commission (EQC) is New Zealand's primary provider of seismic disaster insurance to residential property owners<sup>62</sup>. The EQC is a Crown Entity, wholly owned by the government of New Zealand and controlled by a board of commissioners. Crown Entities are not government departments or state-owned enterprises but nevertheless belong to the government and are subject to public sector finance and reporting rules.

EQC administers the Natural Disaster Fund. The government guarantees that this fund will meet all its obligations. It does this by securing New Zealand residential property owners against the cost of these disasters and by helping organize repair and replacement after the event. The main mechanism for this is the provision of seismic disaster insurance to property owners who insure against fire. All residential property owners who voluntarily buy fire insurance from private insurance companies automatically acquire EQCover, the Commission's seismic disaster insurance cover<sup>63</sup>. EQCover premiums are added to the cost of the fire insurance and passed on to EQC by the insurance company.

EQC's administration of the natural disaster insurance scheme involves: collecting premiums via insurance companies; processing and meeting claims by insured people; administering a disaster fund; investing the fund in accordance with government directions; organizing reinsurance as a potential supplement to the fund; accounting to its shareholder (the government). EQC also encourages and funds research about matters relevant to natural disaster damage and it educates and otherwise informs people about what can be done to prevent and mitigate damage caused by natural disasters.

Home and contents insurance policies in New Zealand usually cover floods and storms as well as fire. EQC is in effect a first loss insurer and provides cover on a replacement value basis for NZD 100 000 plus taxes on the dwelling, NZD 20 000 plus taxes on contents and unlimited cover for land within certain constraints in the **perils** [e.g. floods, hurricanes, earthquakes, storms, landslides, tsunamis, hailstorm, dryness, fire (not man-made) of catastrophic consequences, volcanic eruptions, etc.] and **lines** [e.g. commercial/personal property, business interruption, worker's compensation, life, crops, grounds, livestock, public infrastructure etc.] covered under the Earthquake Commission Act 1993.

Coverage is triggered by the occurrence of any of the events noted above. If an owner of a dwelling or contents insures the dwelling or contents against fire damage, EQC cover is compulsory and is collected on EQC's behalf by the Fire Insurer. A standard premium has been charged since 1945 of 5 cents per

NZD 100 sum insured. Deductibles are imposed according to the following scale: dwelling ► NZD 200 or 1 per cent of the amount payable per dwelling; contents ► NZD 200; land ► the greater of NZD 500 or 10 per cent of the amount payable to a maximum of NZD 5 000. The minimum sum insured is NZD 1 000 per square meter of the dwelling. The maximum compensation is NZD 100 000 plus tax for a dwelling, NZD 20 000 plus tax for contents and unlimited on land. The private sector can provide cover above the EQC limits. The system is managed by the EQC and it is funded by premiums income and investment income on a fund of approximately NZD 5 000 million.

## NORWAY

### *National Fund for Natural Disaster Assistance (Statens Naturskadefond)*

During the first half of the 20<sup>th</sup> century, insurance against natural disasters such as landslide, flood, storm and tempest was not widely available in Norway<sup>64</sup>. Against this background, a Law was passed on 9 June 1961 and the Norwegian National Fund for Natural Damage Assistance (*Statens Naturskadefond*) was established with the aim of compensating damage caused by natural perils and promoting the adoption of preventive measures against such perils. Compensation according to the Law of 1961 was granted to damage to real property and movables caused by natural perils which were defined as landslide, flood, inundation, storm and tempest, earthquake, volcanic eruption or similar disasters. There was no compensation for damage directly caused by lightning, frost, or drought. Nor was damage caused by rainfall and breaking up of ice compensated, and there were also other exceptions and limitations *e.g.*, for damage to forests and non-harvested crop. The amount of compensation was also limited.

Although the Law on natural perils represented an advance over the previous state, the situation was not considered to be satisfactory and, in 1971, a committee was appointed to study the possibility of amending the Law of 1961 and the possibility of covering damages caused by natural perils through insurance.

With a view to providing adequate cover at reasonable premiums for those who were exposed to catastrophic risks, it was considered necessary to link the coverage against natural perils to an already existing form of insurance. In this perspective, a proposal was made to make insurance against natural perils a compulsory part of all fire insurance of objects and property in Norway. Insurance against natural perils has always been included in motor hull insurance, machinery insurance and other types of all-risk insurance.

Further to the proposal of the committee, the Law on Natural Perils and the Law on Insurance Contracts were amended in 1979. A special Law on Natural Perils Insurance was then approved on 16 June 1989 and it entered into force on 1 July 1990 (Law n.70 of 16 June 1989). According to Article 1 of Law n.70, insurance of objects against fire shall also comprise natural perils to the extent the damage is not covered by other insurance contracts (e.g. motor hull insurance).

### ***Norwegian Natural Perils Pool***

The activity of the Norwegian Natural Perils Pool is authorized in Law no. 70 of 16 June 1989 related to natural disaster insurance with amendments, Law no. 98 of 17 December 2004 and Rules for the Norwegian Natural Perils Pool established by Royal Decree of 21 December 1979 with subsequent amendments set forth by the Ministry of Justice. The Pool is organized as a distribution pool, which means that the participating companies keep direct contact with their policyholders, while the Pool settles natural disaster damage compensation among members and makes reinsurance arrangements. All non-life insurance companies writing fire insurance in Norway are obliged to become members of the Norwegian Natural Perils Pool. At present, approximately eighty companies are members of the Pool, which now covers losses caused by landslide, storm, flood, earthquake and volcanic eruption<sup>65</sup>.

## **POLAND**

In terms of natural disasters, Poland is mostly exposed to ***flooding*** and ***storms*** and the most exposed areas are those along the rivers shores.

There is no central institution in Poland in charge of disaster management or compensation. However, there are agencies in charge of risk assessment and monitoring:

- A governmental Crisis Coordination Agency operating under the auspices of the Ministry of Interior and Administration;
- Local organizations linked to the Ministry of Environment, for example the Regional Agencies of Water Management and the Centre for Coordination of Anti-flood Protection: these organizations are responsible for minimizing the risk of natural catastrophe and creating crisis response plans in the event of a disaster;

- The Meteorology and Water Management Institute, which provides information on flood or hurricane dangers on its website or by traditional media; and,
- Local authorities (communes, districts and other local authorities) are obliged to prepare crisis response plans, which include detailed assessments of the risks, initial disaster responses, and systems of mitigation of further damage.

In addition, the insurance industry, under the auspices of the Polish Insurance Chamber, has drawn up an assessment system for flood threat and risk accumulation, which will offer insurers a view of flood risk in their insurance portfolio. This system may lead to a diversification of premium rates, in accordance with geographic location. In terms of risk modeling, insurers create models to estimate the damages caused by the natural forces for purposes of reinsurance and to protect their own insurance portfolios. Reinsurance brokers already have some models adjusted to the Polish environment.

With the limited exception of the agricultural sector, where there is a system of compulsory insurance covering farm building damages against flood, hurricane, or fire, insurance coverage against natural disasters is marketed on a voluntary basis in Poland. The penetration rate stands at approximately 12 per cent of the population and 28 per cent of businesses. While ARTs are not commonly used in Poland, with the growing cost of reinsurance and the frequency of catastrophes, these instruments may become an attractive alternative to traditional reinsurance of catastrophic events and may also become an alternative to classic direct insurance against natural disasters.

The Polish supervisory authority has developed a system for the collection of information from insurers regarding the estimated amount of compensations paid by insurers following a natural catastrophe. This system has enabled a monitoring of the effects of natural catastrophes on the financial stability of insurers.

The development of a legal regime related to the reduction of the effects of natural disasters and assistance to insured parties began in earnest after the major flooding of July 1997. There are two components: (i) *ad hoc* compensation of disaster losses; and (ii) permanent acts and regulations that apply when specified conditions are met, providing for a more structured mechanism of state funding for the compensation to victims of catastrophes. This system includes various different measures, including: assistance provided to support the affected population and small and medium-sized businesses; reconstruction of technical infrastructure of regional self-government units;



reconstruction of public roads, bridges, and railroads; reconstruction and construction of water containers, and repairs of flood protection structures; rebuilding the elements of protection against natural disasters, such as modernization of flood protection systems, hydromechanics infrastructure, forecasting, monitoring and warning systems; repair, reconstruction, and modernization of water land improvement systems in regions endangered by flood; preferential loans for repairs and reconstruction dwellings and houses; and payment of damages for persons who suffered losses in connection with collective actions aimed at fighting natural disasters. The most important sources of financing are the state budget (including targeted reserves and ministerial budgets), the budgets of regional self-government units, the national assistance funds (the National Fund for Environment Protection and Water Management, Ecofund, and others), and non-budget means obtained through public fundraising.

According to the Polish authorities, the major remaining shortfalls and problems regarding risk prevention and mitigation in Poland include the very low risk awareness among population, the lack of a system of compulsory insurance against natural disasters, the lack of a comprehensive emergency management legislation, and the inadequacy of the financial means allocated to disaster mitigation and prevention in relation to existing needs.

## PORTUGAL

As far as natural disasters are concerned, Portugal is mostly exposed to *seismic risk*. According to a technical study prepared by the Portuguese Insurance Association (APS – *Associação Portuguesa de Seguradores*), the Portuguese territory is divided in five zones: the whole region of Algarve and the southwest coast, including the city of Lisbon, are the most exposed areas.

Regarding the quality of buildings, the first anti-seismic construction appeared in the time of Marquês de Pombal, which was applied with rigidity after the massive 1755 earthquake. However, the first anti-seismic legislation only appeared in 1958.

Earthquake insurance is not compulsory in Portugal, but several banks require insurance coverage for seismic risk (together with mandatory coverage for fire risk) as a condition for financing the purchase of a house. Available statistical data show that only near 18 per cent of buildings covered against the risk of fire are also insured against seismic risk. The proportion of buildings insured against seismic risk is much higher in more exposed areas (near 24 per cent) than in northeast zones (only 8 per cent), showing some degree of risk awareness.

Given its small dimension, the Portuguese insurance market does not absorb catastrophic risks alone: reinsurance arrangements – usually in the form of excess of loss treaties – are made with large international reinsurance players, essentially from German and Swiss markets. With the benefit of these reinsurance programs, Portuguese insurance companies apply the same underwriting procedures and pricing models as those used by the large international reinsurers specialised in seismic risk. In light of the above, the Portuguese market has not felt any significant impact from recent disasters. However, a major question relates to some level of incapacity to deal with aggregate losses if a major earthquake occurs, without a pooling or other mitigation mechanism in place specifically devoted to seismic risk management. The Portuguese private insurance sector, in cooperation with the government, has been studying a possible pooling mechanism to cover losses due to seismic risks.

The Portuguese legislation requires insurers, among other things, to constitute an equalization reserve, which is intended to meet exceptionally high claims in those classes of insurance that, by their nature, are expected to produce the greatest variations. Regarding seismic risk, Portuguese regulation determines that the provision should be made in the form of an annual allocation until the accumulated amount of the provision reaches no more than the equivalent of 75 per cent of the insurer's own capital. The establishment of the equalization reserve – like any other technical reserve imposed by Portuguese insurance legislation – is tax exempt.

## SLOVAK REPUBLIC

In terms of natural disasters, the Slovak Republic is mostly exposed to *floods* and *windstorms* but the value of the potential damage is not significant compared with general insurance claims. The last significant windstorm in 2004 inflicted serious damage over an area of more than 200 square kilometers. The storm affected more than 5 000 people and caused financial losses estimated at approximately USD 400 million.

Due to the low level of disaster insurance penetration, the government was called upon to provide *ex post* compensation especially in case of extreme hardship for the victims. At present, there is no compulsory natural disaster insurance for any type of perils/insurance lines in this country. No special measures have been taken by public bodies or private entities to develop an adequate financial coverage of population and corporate entities. Insurance companies do not make any special provisions for potential catastrophic losses.

A flood risk management platform including a detailed flood risk map of the Slovak Republic has been successfully developed during the past years under the auspices of the Slovak Association of Insurers and, according to the Slovak authorities, flood risk coverage is not granted in the most flood prone areas. The Slovak Hydro-Meteorological Institute (SHMU), in cooperation with the Slovak Insurance Association, has recently entered into an agreement with a private company for the cooperative development of a windstorm evaluation and risk management tool that will complement the existing risk management platform. The partnership will create a new product for the insurance industry that evaluates and performs risk assessment of windstorms. The windstorm risk layer will seamlessly integrate into the existing risk management platform for the Slovak Republic.

## SPAIN

Spain is mostly exposed to *flood* in terms of actual damages experienced and *earthquake* and *tsunami* in terms of potential damages. The main vulnerabilities arise from the concentration of people and values in flood-prone areas and in areas exposed to the risk of tsunami.

Risk mitigation measures have included building codes, earthquakes retrofitting, basins management, and river warning tools. Private insurance companies are not very active in the field of prevention, which is mainly addressed by governmental bodies.

The *Law on Civil Protection* (2/1985) establishes the main concepts in order to protect population against disasters and refers to the responsibilities of all stakeholders: national, regional and local administrations, and the citizens. The 1992 *Basic Rule on Civil Protection* (Royal Decree 407/1992) establishes guidelines for the elaboration of Emergency Plans: (a) Special Plans for floods, earthquakes, wildfires and volcanic eruptions with national consequences, and which are national in scope, requiring the intervention of the each Administration level (national, regional and local); and (b) Territorial Plans for other natural perils, and which require the intervention of the regional and local administrations. Special Plans must be elaborated under the Civil Protection Basic Planning Rules, regarding aspects like risks assessment (degree of danger, vulnerability, etc), alert systems, and emergency measures.

The major remaining identified shortfalls regarding risk prevention are overall country risk maps and coordination among different official bodies and public institutions. In terms of post-disaster reviews, competent official bodies review the performance in all management fields after a disaster in order to

resolve eventual gaps and weaknesses. Normally, reports about these reviews are not published.

### ***Consortio de Compensación de Seguros***

Catastrophic risks coverage is carried out in Spain by the *Consortio de Compensación de Seguros*, a public non-profit institution attached to the Ministry of Economy and Finance. Set up in 1941 as a provisional body<sup>66</sup> to face the needs for indemnities resulting from the Civil War (1936-1939), the Spanish *Consortio de Compensación de Seguros* was given its permanent status from 1954<sup>67</sup>. After that date, the activity of the *Consortio* focused on the coverage of the so-called extraordinary risks and it began to play a central role in the related indemnity system. Since the approval of its Charter in 1990<sup>68</sup>, which came into force in 1991, the *Consortio* lost its legal monopoly for covering extraordinary risks in Spain and it is no longer a self-running body of the Ministry of Economy and Finance, but a state-owned company - currently a public business entity - with full powers to act.

The *Consortio* has its own assets and liabilities, separate from those of the state, and its activity is governed by private law. This means that the new company, when doing insurance business, apart from being governed by the terms of its own Charter, is subject, like any other private insurance company, to the legal rules laid down in the *Private Insurance Ordering and Supervision Act* and its enacting regulations, and to the *Insurance Contract Act*. Just like any other insurance company, therefore, the *Consortio* is subject to prudential rules for the solvency margin and for setting up technical reserves. The equalization reserves to be created by the *Consortio* for the catastrophic risks coverage enjoy favorable fiscal treatment.

The aim of the *Consortio* is to indemnify claims made as a result of extraordinary events, such as natural disasters or other events with heavy social repercussion, that occur in Spain and cause injuries and damage to people and assets in Spain<sup>69</sup>, whenever any of the following conditions are met: a) the extraordinary risk is not specifically and explicitly covered by another insurance policy; b) the extraordinary risk is covered by another insurance policy but the company that issued this policy cannot meet its obligations. The risks included in the Spanish system for the coverage of extraordinary risks in practice are not assumed by insurance companies, even if the system legal rules permit insurance companies to cover these types of risks. The *Consortio*, in a subsidiary manner, assumes these risks; the insurance companies underwrite and manage the policies (with the compulsorily coverage attached) and the *Consortio* collects surcharges. The *Consortio* manages claims, losses adjustment, and indemnifications. The *Consortio* does not reinsure its risks, and

thus retains all the extraordinary risks covered. This state-sponsored system for the coverage of extraordinary risks is backed by an unlimited State guarantee. This guarantee has never been used.

The perils covered under the Spanish system for the coverage of “extraordinary risks” are listed in the applicable Regulation and include: extraordinary floods, earthquakes, seaquakes, volcanic eruptions, atypical cyclonic storms (tornadoes and gusts of wind above 135 km/h included) and fall of sidereal bodies and meteorites. The lines of insurance that must include coverage for extraordinary risk are the following: fire and natural events; land vehicles (vehicle damage, not civil liability); railways vehicles; other damages produced to goods (robbery, plate glass, machinery breakdown, electronics equipments and computers); business interruption; and life. Accident insurance is also included, even if contracted additionally to another type of insurance, as life or motor vehicles, or within the framework of a pension plan.

The purchase of insurance is generally optional, but in certain lines of insurance (see the lines of insurance mentioned in the preceding paragraph) it is compulsory to include in the policy base an extraordinary risks coverage clause. These lines mainly refer to losses on properties (material damages and business interruption) and personal accidents. It should be noted that protection against extraordinary risks is entirely separate from protection against other risks provided for in the policy. In other words, the coverage of extraordinary risks protects the same property or persons for at least the same amount insured.

Coverage is triggered by any loss from any ‘extraordinary risk’. This coverage is qualitative, not quantitative (there are no minimum or maximum damage amount requirements). The maximum amount of compensation depends on the amount insured in the policy base. With respect to property damage, the indemnity paid by the *Consortio* covers material losses, regarded as being the destruction or deterioration of the property insured, and direct losses, so damage caused directly by the event. The coverage includes business interruption. In respect to the cover for natural catastrophes, a change was made in 1986 from a system of indemnities based on a prior official declaration of a disaster area which took the geographical area of the loss and the volume of losses into account to a system of automatic indemnity, which provides cover subject only to the prerequisite that the policies, the damage and the events giving rise to the loss meet the legally established parameters.

In recent times, the deductibles applied in the system have been reduced. Currently, concerning direct damages to goods, a deductible of 7 per cent of compensable loss is retained by the insured. This deductible is not applied to vehicles insured through motor car insurance policy, to buildings, or to

communities of dwelling owners. Concerning insurance covering persons, no deductible applies. For business interruption cover, the deductible is the same provided by the base policy.

As mentioned, the coverage provided by the *Consortio* for extraordinary risks is financed by surcharges applied to the policies in the lines cited above and which are paid by policyholders. The surcharges rates are applied nationally, and are fixed depending on type of the exposures covered (offices, housing, industrial, commercial, etc). In 1986, a change was made regarding the surcharge used to fund the *Consortio*; instead of charging a percentage on the base premium, a system of own rates is now applied on the sums insured in the policies. The *Consortio's* surcharge must be compulsorily incorporated into the premium charged for every policy of insurance in the above-mentioned classes, irrespective of whether said policy provides for the coverage of extraordinary risks to be effected by the private company, or whether this is excluded (in which case the *Consortio* shall be responsible).

The *Consortio* is governed by a board of directors with members from government and the private insurance market. The chairman, a government official, is the General Director of the Directorate-General for Insurance and Pensions Funds.

## SWITZERLAND

Switzerland's morphology, climate, weather and natural history have made the population well aware of the natural hazards (especially *avalanches*, *floods* and *landslides*), and of the need for prevention, mitigation and insurance cover.

Under Swiss federal law, the coverage of flood, inundation, windstorm, hail, avalanche, snow pressure, rock and stone fall, and landslide (but not earthquake) is mandatorily included in the scope of fire insurance for buildings and chattels. In the 26 cantons of Switzerland there are two different systems to cover such risks.

In the cantons Geneva, Uri, Schwyz, Ticino, Appenzell Inner Rhodes, Valais and Obwalden, coverage is provided by private insurance companies. In 1939 a group of Swiss insurers, under the auspices of the Swiss Insurance Association (SVV), formed the *Natural Perils Pool* to share natural catastrophe risks. Participants in the *Natural Perils Pool* extensively reinsure the coverage they provide in the international reinsurance market.

In the remaining 19 cantons, coverage is provided by the Cantonal building insurance companies (KGV - *Kantonale Gebäudeversicherungen*). These

institutions, governed by public law, enjoy a monopoly in their respective cantons. The Intercantonal Community for Risks from Natural Elements (IRG), a system of mutual contingent obligations, allows participating cantonal insurance companies to share natural disaster losses. Stop-loss reinsurance coverage for natural disaster risks is available through the Inter Cantonal Reinsurance Union (IRV - *Interkantonaler Rückversicherungs-Verband*), which in turn reinsures in the international market.

Given the high value and density of assets located in Switzerland, earthquake insurance is being considered for inclusion in the coverage provided by the *Natural Perils Pool* and the Cantonal building insurance companies.

The premiums in respect of natural hazards covered under fire insurance are based on industry tariff rates. The Federal Council issues detailed rules on the basis for calculating premiums, the scope of cover, limits on liability, and statistics to be compiled by insurers. The Federal Office for Private Insurance (FOPI), the Swiss insurance supervisor, checks that the premium rates are fair in terms of risks and costs.

Swiss insurers seek to enhance disaster risk awareness and the need for prevention and mitigation on a continuous basis. Moreover, there exists a culture of prevention and mitigation of natural catastrophes. Federal and cantonal authorities assess and monitor natural perils on a continuous basis, and post-catastrophe reviews are made routinely at the local level. According to the Swiss authorities, emergencies have been handled effectively and mitigation measures have been efficient.

## **TURKEY**

Turkey is one of the countries that have long been affected by many natural disasters, particularly, *earthquakes* and *floods*. The existing earthquake map of Turkey demonstrates that 96 per cent of the land is susceptible to earthquake risk with varying degrees. Earthquake counts for two thirds of the natural disasters occurred over the last 60 years. The latest two major earthquakes occurred in 1999: August 17 (magnitude 7.4) and November 12 (magnitude 7.1) in the Marmara region caused loss of thousands of lives and imposed a large financial burden on the economy and the government.

### ***Turkish Catastrophe Insurance Pool (TCIP)***

The impact of recent natural disasters and the low level of insurance penetration led the government to initiate studies to promote disaster insurance and to establish a widespread and effective earthquake insurance system<sup>70</sup>.

Following the 1999 earthquake disasters that occurred in the Marmara Region and Duzce, earthquake insurance was made compulsory primarily for dwellings through an Earthquake Insurance Program. The *Turkish Catastrophe Insurance Pool* (TCIP) was launched by the Turkish government in cooperation with the World Bank in September 2000. In addition to the legal framework of TCIP, a new code on building inspection was enacted by the Parliament. Earthquake insurance premiums are ceded to the TCIP, which is managed by the Natural Disasters Insurance Council, DASK in the Turkish abbreviation.

The TCIP was set up in fulfillment of the government decree-law as a separate state-owned legal entity to provide compulsory earthquake insurance to all registered residential dwellings that fall within municipality boundaries in Turkey. The pool provides earthquake coverage up to certain limits for a premium which varies across the country depending upon seismicity, local soil conditions, and the type and quality of construction. The TCIP is managed through the TCIP Management Board consisting of members from public and private sectors and academic community. The Management Board consists of representatives of Prime Ministry, Undersecretariat of the Treasury, Ministry of Public Works, Capital Market Board, Insurers Association, Operational Manager, and an earthquake scientist.

The compulsory scheme covers only residential buildings that fall within municipality boundaries. Under Decree No. 587, the taking out of earthquake insurance was made compulsory for all residential buildings that fall within municipality boundaries starting from September 27, 2000. Industrial and commercial risks as well as residential buildings in small villages (with no municipality established) can be insured on a voluntary basis. Eligible policyholders are owners or usufructuaries of dwellings that fall within municipality boundaries. Before September 2000, earthquake insurance in Turkey was mostly provided as an allied peril to the fire policy and engineering policy.

The compulsory earthquake insurance is a stand-alone product sold separately from fire (or homeowner's) insurance. It covers building damages for the following risks: earthquake; fire related to earthquake; explosion related to earthquake; and landslide related to earthquake. As an enforcement mechanism, homeowners have to present their insurance policy to the land register office every time they want to start an administrative procedure concerning the building subject to mandatory insurance coverage. Recently, a proposal was made to extend such a requirement to other public services and to create some new checkpoints.



The aim of the TCIP is to provide an adequate level of protection with affordable premiums. Therefore, the maximum coverage limit of compulsory insurance is currently NTL 110 000. This limit is adjusted annually according to changes in the construction price index. Policyholders are free to buy additional coverage in excess of this limit from insurance companies if the value of their dwelling is more than this amount. When assessing claims, the TCIP takes into account market reconstruction prices at the date of the event for each type of building. Any loss payment is limited to the sum insured. In the case of masonry type of buildings or small dwellings, the sum insured is usually below the maximum coverage limit. The sum insured is calculated by multiplying the gross square meter of dwelling by the relevant unit reconstruction cost. There is also a two per cent deductible applied on the sum insured.

Local insurance companies act as distributors of the TCIP policies. Coverage in excess of the TCIP coverage can be obtained on a voluntary basis from private insurance providers. To issue policies, the pool agents and insurance companies can, in addition to insurance company underwriting systems, use an internet-based underwriting platform that enable the TCIP to control its risk accumulations in real time and maintain the quality of underwriting. The TCIP operates as a catastrophe risk transfer and risk financing facility.

Established under the supervision of Undersecretariat of the Treasury as the national sole-source provider of earthquake insurance, it is expected that the TCIP will raise the financial preparedness of Turkey for future disasters, reduce government fiscal exposure to major catastrophic events, and will make liquidity readily available to insured homeowners affected by such future events. The TCIP is modeled after the California Earthquake Authority and New Zealand EQC programs, which provide similar earthquake coverage for homeowners and rely mainly on international reinsurance and capital markets for their risk capital capacity. The TCIP in fact cedes, and will cede, a large amount of its risk to international reinsurance markets until sufficient financial resources are accumulated within the TCIP.

The compulsory earthquake insurance scheme aims to alleviate the financial burden of earthquakes on the government budget, to ensure risk sharing by residents, to encourage standard building practices, and to establish long-term reserves in financing future earthquake losses. Although the original design of TCIP envisaged a multi-peril coverage, it currently provides only compulsory earthquake insurance coverage. New products for other natural disasters such as flood and landslide may be offered in the future.

Most of the functions and operations of TCIP are outsourced to minimize cost and create an efficient operational structure. For example, operational management has been contracted out to leading reinsurance companies of Turkey (Milli Reinsurance Company from 2000 to 2005 and Garanti Insurance Company since August 2005). Likewise, insurance companies and their agencies are carrying out distribution of policies and marketing functions, and independent loss adjusters are carrying out loss assessment. Currently, more than twenty insurance companies are entitled to distribute TCIP policies.

The TCIP has a simple pricing matrix as show below. Pricing accounts for seismicity and construction type. Prices range from 0.4 per mille at the lowest to five per mille at the highest. The earthquake map used by TCIP divides Turkey into five different categories of land according to the vulnerability factors whereas the tariff divides buildings into three categories according to their construction types. As the result of two groupings, fifteen different rates (per mille) are applicable for buildings according to location and the type of the construction.

**Table 1. TCIP region-based rates according to construction type (per mille)**

Type of Construction	Risk Regions				
	I	II	III	IV	V
Steel, reinforced concrete	2.20	1.55	0.83	0.55	0.44
Masonry	3.85	2.75	1.43	0.60	0.50
Other	5.50	3.53	1.76	0.78	0.58

Source : TCIP

The TCIP has accumulated premium revenue since the beginning of the program. The TCIP uses this financial resource to pay claims and buy reinsurance coverage. As a result, building damages because of earthquake can be compensated quickly without reverting to government budget.

Enforcement problems have been reported, and penetration rate remains relatively low. To improve the current enforcement level, for instance, homeowners could be obliged to present their insurance policy when opening an

account for such services as gas, water, electricity and telecommunications. Increasing the level of insurance penetration, in fact, remains the key challenge of the TCIP.

The Undersecretariat of the Treasury is responsible for overseeing of the program, and auditing of all operations and accounts of the TCIP. Annual accounts are also audited by an independent auditing firm. The TCIP and its revenues are exempt from all kinds of taxes, levies and charges and accumulated funds are kept in segregated accounts. Funds are being managed by the Operational Manager and invested in diversified financial instruments following the TCIP Board's investment guidelines.

## **UNITED KINGDOM**

As concerns the compensation of losses due to catastrophes, the general trend in the British system has been to opt for individualized solutions. According to some commentators, in fact, in the UK there is a strong tradition of the State distancing itself from compensation payments<sup>71</sup>. In terms of exposure<sup>72</sup>, the main risks faced in this country are *storms, flood* and *terrorism*.

### ***Coverage of flood damages***

The majority of both commercial and residential policies in the UK currently include coverage for the full array of natural perils. Unlike in most OECD countries, insurance coverage against flood damage has been a standard feature of household policies in the United Kingdom since the early 1960s. The British insurance industry was able to make this commitment to its customers on the understanding that the Government would provide effective flood defences<sup>73</sup>.

Insurance enables householders and businesses to minimize the financial cost of damage from flooding. In the modern competitive insurance market, the old tariff pricing system has been replaced by risk-based pricing where good information is available on risk levels for example on local crime levels, or on the fire hazard of specific house construction types. This enables insurance to be offered at very competitive prices to customers living in low risk areas.

Following the floods of autumn 2000, and because insurers recognized that the government needed time to put new policy plans in place, the insurance industry - via the Association of British Insurers (ABI) - created a two year agreement on flood cover. This industry initiative committed ABI member companies to continue to insure their existing domestic and small business policyholders, save in exceptional circumstances.

In November 2005 the ABI issued a Revised Statement of Principles, in which they declared that is the intention of ABI members that flood insurance for existing domestic properties and small businesses should continue to be available for as many customers as possible. The premiums charged and other terms - such as excesses - will reflect the risk of flooding but will be offered in a competitive market. The revised Statement of Principles applies from 1 January 2006, but is subject to review in the event of significant external shocks such as withdrawal of flood reinsurance<sup>74</sup>.

ABI made clear that successful operation of the Statement is dependent on action by the government to manage flood risk effectively. In particular, ABI requested that government shall be engaged in: (a) reducing the annual probability of flooding each year for a substantial number of properties in the UK, a proportion of which currently have a significant chance of flooding (greater than 1.3 per cent annual probability); (b) maintaining investment in flood management each year, so that outputs can be sustained in real terms, with a commitment to evidence-based discussions on future funding needs, taking account of climate change and other factors affecting risk; (c) implementing reforms to the land-use planning system to ensure that new developments do not lead to an increase in national or local flood risk; (d) communicating flood risk effectively, including providing higher quality and more detailed information on flood risk, and on existing, new and upcoming flood protection schemes; (e) developing an integrated approach to urban drainage that alleviates the risks of sewer flooding and flash-flooding.

### ***Coverage of terrorism risk***

After frequent terrorist attacks from the IRA, insurance coverage for terrorism risk became unavailable in the UK and this led to the establishment of Pool Re in 1993. Pool Re is a mutual reinsurance company authorized to transact reinsurance business in the United Kingdom. The scheme covers damage to property and business interruption losses resulting from such damage (if that cover has also been selected) resulting from an Act of Terrorism, as defined in the enabling Act of Parliament, the Reinsurance (Acts of Terrorism) Act 1993<sup>75</sup>.

A large number of the most significant providers of commercial property insurance operating in the UK, including syndicates operating within the Lloyd's market, are members of Pool Re, and have agreed to offer terrorism cover as defined under the scheme to any client or prospective client who requests it to be included in their commercial property policy. On request by a policyholder, an insurer participating in the Pool Re scheme will quote a premium for the inclusion of terrorism cover. If the quote is accepted, terrorism

cover will then be added to their commercial property policy. Alternatively, the insurer may simply include the cover within its standard policy without the need for separate consideration by the insured. Pool Re has arrangements with all its members under which it will reimburse them the cost of the claims they pay under the terrorism cover they provide to their policyholders, subject to a loss retention which they must pay themselves. Insurers pay premium to Pool Re for this cover; the retention varies between insurers depending upon the size of their terrorism insurance portfolio.

Since 2002 the cover provided by members of the Pool Re scheme was extended to an “all risks” basis, and not restricted to fire or explosion as hitherto. In addition, exclusions relating to chemical, biological, radiological or nuclear attack were removed, leaving the scheme able to respond to events which include damage arising from such causes<sup>76</sup>.

Most types of commercial property are eligible for coverage under the scheme: buildings, their contents, site property, construction projects and plant and machinery, as well as transport, communication and energy infrastructure<sup>77</sup>. To be eligible for the scheme, the property must be located in England, Scotland or Wales; it does not apply to property in Northern Ireland, the Isle of Man or the Channel Islands. Since terrorism cover is not provided under the scheme on a ‘stand-alone’ basis, the property must be insured under a general commercial property policy issued by a Pool Re member covering conventional fire and explosion damage.

Pool Re’s Retrocession Agreement with HM Treasury provides funding in the event that it exhausts all its financial resources following claim payments<sup>78</sup>. The government, therefore, is acting as lender of last resort<sup>79</sup>.

## **UNITED STATES OF AMERICA**

Traditionally, in the United States, local and state governments are charged with the primary responsibility of responding to disasters. The federalist structure, which authorizes states to execute general police powers, means that a majority of resources are distributed on a local level<sup>80</sup>. Virtually every state has adopted statutes which grant emergency or disaster authority to local governments. Most state statutory schemes are divided into two separate categories; emergency planning and emergency response. Moreover, in each state, the governor has the authority to declare a state of “emergency” on a state-wide basis, while mayors are charged with declaring “emergencies” on a local level.

Contrary to popular misconceptions, the federal government does not view itself as the primary caretaker for disaster relief. Indeed for most of the United States' history, federal disaster relief was only provided for on an *ad hoc* basis<sup>81</sup>. No comprehensive federal emergency management system was in effect, and thus disaster mitigation was never a federal pursuit. However, with the expansion of the federal government under new deal legislation, the federal government slowly began extending the reach of its disaster relief efforts.

### ***US Disaster Mitigation Pre 9/11***

In 1979, President Jimmy Carter created the Federal Emergency Management Agency (FEMA), an independent cabinet level agency aimed at coping with national hazards<sup>82</sup>. Even at its inception, FEMA's mission was ambitious and ambiguous. Its mission was to respond to "all hazards", coordinating efforts to keep the nation safe from a spectrum of domestic dangers created by "acts of god"<sup>83</sup>. Subsequently, the Regan administration, engrossed in the trawls of the cold war, focused most of FEMA's resources on the "continuity of government", that is, on salvaging the nation in the event of a nuclear attack. Indeed it was not until the end of the cold war that FEMA began focusing a majority of its resources on handling natural disasters.

However, FEMA had relatively little experience in handling natural disasters, as demonstrated by its response to Hurricane Andrew in 1992. The storm devastated Florida and Louisiana, killing 23 people<sup>84</sup>. Once in office, Bill Clinton appointed his former Arkansas Emergency Management director, James L. Witt to head FEMA<sup>85</sup>. 1993, Witt announced plans for a major overhaul of the Agency's approach to disaster response. Witt desired to create closer coordination with local and state emergency offices. Perhaps more significantly, Witt focused FEMA's attention and resources for the first time on the benefits of disaster mitigation. Witt established "Project Impact" a federal mitigation program designed to foster partnerships between federal, state and local governments, as well as with local private business and non-profit organizations.

In 2000, the Disaster Mitigation Act of 2000 replaced the Stafford Disaster Relief and Emergency Assistance Act<sup>86</sup>. For the most part, the Disaster Mitigation Act of 2000 reconfirmed the pre-existing mandate by congress to "provide an orderly and continuing means of assistance by the Federal Government" to state and local governments charged with responding to disasters<sup>87</sup>. In particular, USCS § 5121(b)(4-5) states that Congress shall "encourage individuals, States, and local governments to protect themselves by obtaining insurance coverage to supplement or replace governmental assistance" and "encourage hazard mitigation measures to reduce losses from

disaster, including development of land use and construction regulations.” This language is significant because it demonstrates an awareness of the utility of hazard mitigation but an increasing reluctance on the part of the federal government to take full initiative for mitigation programs.

Before 9/11, a new department within FEMA was dedicated entirely to the threat of weapons of mass destruction: in July 2001 the Office of National Preparedness (“ONP”) was established to “lead the management of the consequences of the use of the weapon of mass destruction in the United States, if such use should occur despite the efforts of our Government to prevent it”<sup>88</sup>.

### *US Disaster Mitigation Post 9/11*

Due to the tragic events of 9/11, the federal government shifted its focus from disaster preparedness to disaster response. Moreover, the nature of the disaster focus changed dramatically from natural causes to threats of terror.

Perhaps the most notable and immediate structural change made to FEMA post 9/11 was its loss of status as an independent, cabinet level agency. In response to the catastrophic events of 9/11, President Bush quickly announced the creation of a new federal agency, the Department of Homeland Security (“DHS”). FEMA was subsumed, along with 21 other agencies into the DHS. Many analysts immediately cautioned against the subsuming of FEMA into the DHS. The Brookings Institution, a respected Washington think-tank, stated that a merged FEMA would, “likely become less effective in performing its current mission in case of natural disaster as time, effort and attention are inevitably diverted to other tasks within the larger organization”<sup>89</sup>. Indeed even Congress’ Government Accountability Office called the merger “high risk” for FEMA. Despite much comment and criticism, the reorganization of FEMA under the super-department of DHS, took effect on 1 March 2003. This structural change has proven quite significant for FEMA.

The first consequence of FEMA’s loss of independence is that the director of FEMA no longer reports directly to the president and his staff. Instead, the undersecretary of DHS must report to the secretary of DHS, who, upon his own discretion, relays the matters to the President. This extra layer of bureaucracy is significant because in order for a majority of federal disaster mitigation programs to be triggered, the president must first declare a state of emergency.

The second major consequence of the restructuring of FEMA into the DHS is the process for which funds must now be distributed. Prior to becoming part of the DHS, FEMA was responsible for reviewing, awarding and distributing all mitigation grant funds. Now, FEMA currently has domain over only three

mitigation grant programs; the Hazard Mitigation Grant Program (“HGMP”), the Pre-Disaster Mitigation Program (“PDM”) and the Flood Mitigation Assistance Program (“FMA”) <sup>90</sup>. The HGMP, as authorized under §404 of the Stafford Act, provides grants to States and local governments to implement long-term hazard mitigation measures, but only after the president declares a major disaster. The PDM, on the other hand, provides technical and financial support to States and local governments for “cost-effective” pre-disaster mitigation activities. The FMA provides funding to assist States and communities “in implementing measures to reduce or eliminate the long-term risk of flood damage.” The FMA is also responsible for overseeing the National Flood Insurance Program.

By contrast, the newly created Office of State and Local Government Coordination and Preparedness <sup>91</sup>, also part of the DHS, is now charged with distribution of several key former FEMA grant programs. For example, the Office of State and Local Government Coordination and Preparedness has sole responsibility for the distribution of Emergency Management Performance grants, Firefighter Assistance grants, and Emergency Preparedness grants. <sup>92</sup> However, the problem with this distribution structure is that, in the event of a national emergency, FEMA is still ultimately responsible for the coordination of the personnel and equipment procured with those funds.

The third major consequence of the restructuring of FEMA is that all pre-disaster mitigation grants must now be awarded on a competitive basis. This change reflects the overall policy choice to privatize more and more disaster management responsibilities. However, there is a risk that in a purely competitive grant program, lower income communities will likely be hindered in their ability to effectively compete with more prosperous communities <sup>93</sup>. Considering the fact that low-income communities are the very communities most often at risk for great damage in a natural disaster, an exclusively competitive grant program may undermine mitigation measures on the whole.

The final major consequence of the FEMA restructuring is that of loss of personnel. The loss of FEMA personnel is, in part, a direct result of the merger under DHS. However, an indirect consequence is also being felt in the flight of disaster professional leaving the department for the private sector. This is problematic for the agency because it translates to the loss of years of experience and knowledge. Thus, as a result (both direct and indirect) of FEMA’s recent restructuring, a significant number of FEMA personnel no longer exist to effectuate disaster mitigation measures.



These four main changes in FEMA post 9/11 may have hindered the agency's ability to adequately respond to the disaster caused by hurricanes Katrina and Rita in the Gulf Coast.

### ***Catastrophe Insurance Programs***

In the United States, most property insurance policies, both residential and commercial, are written on an all-risk basis<sup>94</sup>. This means they cover the perils of wind, including tornado and hurricane, as well as fire and explosion. Flood and earthquake perils are normally excluded. Beyond private insurance, marketed on a voluntary basis, there are state mandated pools for certain risks, as well as a few catastrophe funds. Disaster insurance is not compulsory as a matter of law, but it is often required by lenders.

#### *(a) National Flood Insurance Program (NFIP)*

The US Congress established the NFIP on August 1, 1968 - with the passage of the National Flood Insurance Act of 1968 -, as a response to the growing financial impact of flood related damages and the related increasing cost of taxpayer funded disaster relief for flood victims. The NFIP makes federally-backed flood insurance available in communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage<sup>95</sup>.

The NFIP was broadened and modified with the passage of the Flood Disaster Protection Act of 1973 and other legislative measures. It was further modified by the National Flood Insurance Reform Act of 1994, signed into law on 23 September 1994. The NFIP is administered by the Mitigation Division within the FEMA, which in turn is part of the DHS.

The NFIP is a federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding<sup>96</sup>. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the Federal Government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHA), the federal government will make flood insurance available within the community as a financial protection against flood losses.

After the 2005 hurricane season<sup>97</sup>, however, the NFIP's current financial situation became unsustainable and the program came under scrutiny. According to recent reports<sup>98</sup> FEMA lacks the financial resources to cover the

program's costs and the authority to make changes that might ensure that future obligations could be met. It is also stipulated that even if FEMA increases the premiums charged for flood insurance by the maximum percentage allowed by law, premium income in the next several years is unlikely to cover claims, debt service, and other costs of the program<sup>99</sup>.

As a part of NFIP – related reform efforts, the Senate recently<sup>100</sup> passed its version of the Flood Insurance Reform and Modernization Act of 2007 that would extend the National Flood Insurance Program through 2013<sup>101</sup>. The bill provides for reforms to the NFIP, which include measures to restore financial stability of the flood insurance program, such as increasing premiums and reduced subsidies, aimed to put the program which is billions of dollars in debt after hurricanes Rita and Katrina in 2005 on stronger financial footing, modernize the flood mapping, enhances level of consumer protection and encourages a broader participation in the program.

The House of Representatives voted its version of the bill in September 2007. The main differences between two versions of the bill lie in the addition of windstorm coverage, an amendment to the bill agreed by the House of Representatives, and the proposal by the Senate to forgive some USD 17.5 billion in debt, which is not included in the House version. Members of the Senate and House Representatives will be now working together to produce the final compromise version before it can be signed into law.

#### *(b) California Earthquake Authority (CEA)*

California law requires all insurers to offer earthquake insurance with every residential property policy. Residential property insurance includes coverage for homeowners, condominium owners, mobile home owners, and renters. Established in 1996 to relieve pressure on private insurers, the California Earthquake Authority (CEA) is a privately financed, state-run insurance program that sells a “mini-policy” (or “base-limits policy”) with a relatively large deductible (15 per cent of coverage limit) and limited coverage of dwellings, personal property and additional living expense/loss of use. In offering earthquake coverage, private insurance companies can become a CEA participating insurance company and offer the CEA's residential earthquake policies or they can manage the risk themselves. To date, companies that sell over two-thirds of the residential property insurance in the state have opted to become CEA participating companies. The state offers no guarantee: therefore, if losses from an earthquake drain the established fund, the CEA may run out of business and claims will be paid out on a pro-rated basis. In 1998 the CEA was permitted to offer an optional supplementary policy to broaden coverage. Nevertheless, only a small portion of the state's property owners buy earthquake

insurance and the percentage appears to grow smaller as the time span since the last major quake increases<sup>102</sup>.

*(c) Florida Hurricane Catastrophe Fund (FHCF)*

In 1993, the State of Florida established the Florida Hurricane Catastrophe Fund (FHCF) a state-run catastrophe reinsurance program that allows insurers to transfer a portion of their catastrophic risk. The Fund reimburses a fraction of insurers' losses caused by severe hurricanes and it is funded by premiums paid by insurers that write policies on personal and commercial residential properties. An important provision limits the Fund's obligation to pay losses to the sum of its assets and borrowing capacity. This fund is tax-exempt, enabling it to accumulate funds rapidly. The industry is responsible for losses up to a certain level; the premiums they pay for the reinsurance can be passed onto policyholders. In addition to premiums, these programs can use bonding and other financing arrangements if they have a shortfall. The policyholders, however, would have to foot the bill for the financing through assessments on their policies. If the funds are not adequate, claims are paid on a pro-rated basis so policyholders have no guarantee claims their losses will be covered<sup>103</sup>.

*(d) Hawaii Hurricane Relief Fund (HHRF)*

In 1993, Hawaii created a voluntary homeowner's catastrophe fund in order to provide hurricane insurance for customers of insurers which would no longer voluntarily offer such coverage. The Hawaii Hurricane Relief Fund (HHRF), a state-run insurance company, was made up of premiums paid, loans from the federal government, bond proceeds, mortgage fees and insurer assessments. The Fund discontinued its operation by the end of 2000, in light of improved private market conditions.

*(e) Terrorism Risk Insurance Act of 2002 (TRIA) and its extensions*

Pursuant to the Terrorism Risk Insurance Act of 2002 (TRIA), while insurers are required to make available, in all property and casualty insurance policies, coverage for losses arising from an act of terrorism - as defined under Section 102 of the Act -, a special risk-sharing arrangement has been set up by the federal government to limit market exposure. In particular, the federal government offers a backstop facility aimed at limiting private sector exposure in commercial insurance lines<sup>104</sup>. TRIA, therefore, established a temporary Federal program of shared public and private compensation for privately-insured commercial property and casualty losses resulting from acts of terrorism. The Department of the Treasury administers TRIA through the Terrorism Risk Insurance Program (TRIA Program).

TRIA requires that insurers make available coverage for acts of terrorism on the same terms and conditions as other types of coverage offered as part of their commercial property and casualty insurance policies. While TRIA requires insurers to make coverage generally available, it does not contain provisions relating to the pricing of terrorism risk insurance coverage, but rather leaves pricing to whatever provisions may apply under state law and regulation, or to the free market for policies exempt from state rate regulation. TRIA does not require that a policyholder purchase terrorism risk insurance (although, as with workers' compensation insurance, state law may). Thus, if a purchaser declines the offer of terrorism coverage, the insurer can then exclude terrorism losses from coverage under the insurance policy or negotiate other limited forms of coverage, if allowed by state law.

Although TRIA requires insurers to make terrorism coverage offers on the same terms and conditions as other coverage, insurers are not required to make coverage available for losses from a chemical, nuclear, biological, or radiological ("CNBR") terrorist act if coverage for CNBR exposure is excluded in the overall policy, regardless of the cause of the CNBR damage (*i.e.*, the same terms and conditions). Thus, insurers are not required to offer terrorism coverage from CNBR losses if such an exclusion is also applied to losses arising from events other than acts of terrorism, and if permitted by state law.

The TRIA Program covers losses from certified acts of terrorism. In order to qualify as act of terrorism, an event must be certified by the Secretary of the Treasury with the concurrence of the Secretary of State and Attorney General of the United States.

If a certified terrorist act occurs, insurers may be eligible to receive the Federal government's share of the insured losses above a deductible, as specified under TRIA. Insurance companies will cover 100 per cent of the insured losses below their deductible. The insurer's deductible, which has gradually increased through the life of the TRIA Program, is currently set at 17.5 per cent of all the insurer's previous year's premiums earned from policies insuring US risks (including the premiums of any of the insurer's affiliates in the case of insurance groups) through the types of insurance (referred to as "lines" or "lines of business") covered under the TRIA Program. This includes premiums received from all policies sold under commercial lines covered by TRIA, including policies in which terrorism risk insurance was not accepted. Thus, the insurer deductible is the same regardless of the individual insurer's terrorism risk insurance take-up rate. The TRIA deductible has increased from 7 per cent in the first year of the TRIA Program to 17.5 per cent in 2006, and is to rise to 20 per cent in 2007 (though in 2006 and 2007 there are fewer types of insurance in the TRIA Program from which the deductible is calculated).

Insured losses above the insurer's deductible amount will then be shared between the insurance company and the Federal government, with the Federal share equal to 90 per cent of the losses above the insurance company's deductible (and 85 per cent in the final year of the TRIA Program). Neither the Federal government, nor private insurers will be liable, however, for any amount exceeding an annual cap of USD 100 billion in aggregate insured losses (each individual insurers must pay at least its TRIA deductible, however). Beyond that point, TRIA provides that Congress will determine the procedures and source of any further payments.

TRIA does not require participating insurers to pay premiums, rather it provides authority for Treasury to recoup its Federal payments via surcharges on the commercial policyholders of these insurers. A certain amount of recoupment is mandatory, based on insurance marketplace aggregate annual retention amounts specified in TRIA. In other circumstances, however, TRIA authorizes discretionary recoupment.

According to the US Department of the Treasury, the availability and affordability of terrorism risk insurance has improved over the past years. Despite increases in risk retentions under TRIA, insurers have allocated additional capacity to terrorism risk, prices have declined, and take-up rates have increased. The take-up rate has reportedly increased from 27 per cent in 2003 to 58 per cent in 2005, while the cost of coverage has generally fallen to roughly 3 per cent to 5 per cent of total property insurance costs. Insurers' retention of risk has steadily increased under the TRIA Program: deductibles have increased from 7 per cent of direct earned premium in 2003 to 17.5 per cent in 2006, and other changes made to TRIA in 2005 have also increased insurer retentions. The general trend observed in the market has been that as insurer retentions have increased under TRIA and policyholder surpluses have risen, prices for terrorism risk have fallen and take-up rates have increased.

The TRIA Program was originally set to expire on December 31, 2005, but on December 22, 2005, the President signed into law the Terrorism Risk Insurance Extension Act of 2005 (TRIEA), which extended the Program through December 31, 2007 with modifications. The overall structure of TRIA was retained, however. On December 26, 2007, President Bush signed into law the Terrorism Risk Insurance Program Reauthorization Act of 2007 which extends the Terrorism Risk Insurance Act through December 31, 2014.

## *Recent Developments*

In the wake of Hurricane Katrina, several proposals were made in the United States to establish a national catastrophe fund. The NAIC's proposal envisions a three-layer plan encompassing

- sound land use planning, support for loss mitigation, integration of the flood and earthquake perils into basic policy forms that are sold by individual insurance companies;
- state or regional catastrophe pools that provide reinsurance for insurers doing business in the state; and,
- a national mega-catastrophe fund that provides a federal backstop for large-scale insured losses<sup>105</sup>.

Others believe that the private sector is best able to meet the challenges, if empowered to do so. For example, the American Insurance Association has put forward a holistic agenda for action that focuses on mitigation and prevention through such measures as better building codes and land use controls, more insurance market freedom to expand insurance capacity and to base insurance prices more on risk, and improvements to the National Flood Insurance Program<sup>106</sup>. The Reinsurance Association of America, in turn, has expressed its strong opposition to the establishment of government catastrophe funds<sup>107</sup>.

## THE EUROPEAN UNION SOLIDARITY FUND

In European countries, funding for disasters is also provided by the European Union Solidarity Fund (EUSF). Established under the General Directorate for Regional Policy by Council Regulation (EC) n. 2012/2002 of 11 November 2002<sup>108</sup>, the EUSF aims at enabling the Community to express its solidarity rapidly, efficiently and flexibly with the population of a Member State that has suffered a major disaster. The Fund is aimed at intervening mainly in cases of major natural disasters with serious repercussions on living conditions, the natural environment or the economy in one or more regions.

Pursuant to the regulation, a disaster is considered as 'major' if it results in damage estimated either at over EUR 3 billion (2002 prices), or at more than 0.6 per cent of the affected State's gross national income. By way of exception, the EUSF may also respond to extraordinary regional disasters resulting in damage inferior to this threshold, affecting the major part of its population, with serious and lasting repercussions on living conditions and the economic stability of the region. In this context, particular attention is paid to remote and isolated regions, for example the outermost and island regions. Assistance from the EUSF takes the form of a single and global grant, with no necessary co-financing, complementing the public efforts of the beneficiary State.

Intended to finance measures alleviating non-insurable damage in principle, the urgent actions eligible for the EUSF are the following: (i) immediate restoration to working order of infrastructure and plant in the fields of energy, drinking water, waste water, telecommunications, transport, health and education; (ii) providing temporary accommodation and funding rescue services to meet the immediate needs of the population concerned; (iii) immediate securing of preventive infrastructures and measures of immediate protection of the cultural heritage; (iv) immediate cleaning up of disaster-stricken areas, including natural zones<sup>109</sup>.

The EUSF has an annual budget of EUR 1 billion: 25 per cent of this amount must remain available on 1 October of every year to meet possible needs through to the end of the year. In exceptional cases and if the resources remaining for the rest of the year are insufficient, the shortfall may be met out of the next year's budget.

## SELECTED NON OECD ASIAN COUNTRIES

### CHINESE TAIPEI

#### *Residential Earthquake Insurance Pool (TREIP)*

Chinese Taipei is located in an active seismic area and it is also exposed to *windstorm* and *typhoon* risks. Due to intense collision between the Philippine Sea and Eurasian plates, Chinese Taipei has experienced many large-scale *earthquakes* over the years. The September 1999 Chi-Chi earthquake was by far the largest earthquake to hit Chinese Taipei in over 100 years, with a magnitude of 7.6 (Mw). As part of the implementation of a comprehensive disaster prevention and risk management program, the Ministry of Finance (MOF) of the government of Chinese Taipei introduced the Residential Earthquake Insurance Pool (TREIP), originally managed by Central Reinsurance Corporation (Central Re), a government owned reinsurance company. Since 2006, after privatization of Central Re, the management of the scheme has been entrusted to TREIF (Residential Earthquake Insurance Fund), a governmental entity<sup>110</sup>.

TREIP was created according to Article 138-1 of the Chinese Taipei Insurance Act, in July 2001. Regulations and directives followed in November 2001, TREIF was established on 17 January 2002 and TREIP policies became effective from 1 April 2002. The pool was designed to share earthquake risk between private insurance companies and the government and to diversify such risk through a combination of local co-insurance, a non-profit fund (TREIF), international reinsurance, capital markets<sup>111</sup> and government funds<sup>112</sup>.

In the original structure, private insurers retained the first TWD 2 billion of risk, and the government acted as a backstop, assuming the risk above that level and up to a total limit of TWD 50 billion. Since 2007, the limit was raised to TWD 60 billion (see **Box 1**)<sup>113</sup>.



### **Box 1. TREIP's Layers of Coverage**

Since 2007 TREIP has five layers totaling TWD 60 billion in capacity as follows:

1<sup>st</sup> layer of TWD 2.4 billion - domestically licensed insurers (private sector coinsurance pool).

2<sup>nd</sup> layer of TWD 17.6 billion - TREIF.

3<sup>rd</sup> layer of TWD 20 billion - domestic and overseas reinsurance market and/or capital market [during the first three years of operation (2002-2005) part of this risk layer was ceded to capital markets by means of an indemnity based cat bond].

4<sup>th</sup> layer of TWD 8 billion – TREIF.

5<sup>th</sup> layer of TWD 12 billion – Government.

The scheme caps losses at TWD 60 billion. In the event that losses exceed the capped amount, the losses paid to policyholders will be proportionally reduced (proration).

Prior to the creation of TREIP, earthquake insurance was provided as an endorsement to a long-term residential fire policy. Since 1 April 2002, new residential fire policies have been issued on an annual (rather than long-term) basis, and have been changed to automatically cover earthquake risk. Existing long-term policies can also be voluntarily endorsed at any time to provide annual cover for the earthquake peril. As of 31 May 2008, the take-up rate equals 24.98 per cent (22.93 per cent in 2007 / 20.53 per cent in 2006 / 16.67 per cent in 2005) of total estimated 7.8 million households in Chinese Taipei.

The new policies provide indemnity on a replacement cost basis for buildings, with a maximum insured amount of TWD 1.2 million. In addition, a further TWD 180 000 of reimbursement is provided per household for Contingent Living Expenses. No deductible applies. TREIP coverage is provided for an annual flat premium per household (currently: TWD 1,459). For the small number of houses valued at less than TWD 1.2 million, the premium is calculated on a pro-rata basis. Pricing, therefore, is not risk-based<sup>114</sup>.

Insurers will pay the indemnity to insured parties only for: (a) a damaged building that a government agency or civilian authority has declared no longer

fit for habitation or (b) the repair cost for a damaged building, where said cost is more than 50 per cent of the replacement cost. TREIP's portfolios are written by domestic and foreign insurers in Chinese Taipei.

Perils covered include: earthquake shock, fire or explosion caused by earthquake, landslide, land subsidence, earth movement and rupture caused by earthquake and, since 2006, tidal wave, surge and flood caused by earthquake. In addition to earthquake risk, the Financial Supervisory Commission (the supervisory authority in Chinese Taipei) is now planning to establish mechanisms to cover other natural hazards, including typhoons and floods<sup>115</sup>.

## **INDIA**

The territory of the Republic of India is extremely vulnerable to natural catastrophes. Technological disasters and terrorist attacks are also threats faced by the Indian population. The basic responsibility for disaster response measures is entrusted to state governments. In case of major calamities the central government provides additional financial and logistic support<sup>116</sup>.

A new Disaster Management Bill was passed by the Indian Lok Sabha (Parliament) in December 2005. The government decided to enact a central legislation on disaster management in the aftermath of the tsunami disaster on 26 December 2004<sup>117</sup>. The national and state authorities shall be responsible for laying down the policies, plans and guidelines for disaster management. The district authority shall act as the district planning, coordination and implementing body for all disaster management related functions. These functions will include mitigation and preparedness measures also, besides response, relief and rehabilitation. A key role has been assigned to the local authority for ensuring training of its officers and employees; maintenance of resources so that these are readily available for use in the event of a disaster and ensuring that all construction projects in their area of jurisdiction conform to the prescribed standards and specifications. The local authority shall also carry out relief, rehabilitation and re-construction activities in the affected areas.

### ***Calamity Relief Fund (CRF)***

As concerns the funding of disaster response measures and compensation to victims of calamities, a central role is played by the scheme called Calamity Relief Fund (CRF). The scheme will be operative from financial year 2005-06 and continue till the end of the financial year 2009-10. CRF shall be used only for meeting the expenditure for providing immediate relief to the victims of cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloud burst and pest attack.

The amount of annual contribution to the CRF of each state for each of the financial years 2005-06 to 2009-10 has been indicated by the Ministry of Finance<sup>118</sup>. Of the total contribution indicated, government of India will contribute 75 per cent of the total yearly allocation in the form of a non-plan grant and the balance 25 per cent amount will be contributed by the state government concerned.

The share of the central government shall be remitted to the state governments in two installments on June 1, and December 1, in each financial year. Likewise, the state governments shall also transfer their contribution to the CRF in two installments in June and December of the same year, provided that if Ministry of Finance is satisfied that exigencies of a particular calamity so warrant, the State shall be able to draw 25 per cent of the funds due to the state in the following year from the Centre to be adjusted against the dues of the subsequent year.

A state-level Committee, constituted by the state government, administers the CRF. The Chief Secretary to the state government chairs the Committee, which consists of officials who are normally connected with relief work and experts in various fields in the State affected by natural calamities<sup>119</sup>. The Committee shall decide on all matters connected with the financing of the relief expenditure from CRF. The Committee arranges to obtain the contributions from the concerned Governments, administers the CRF and invests the accretions to the CRF in accordance with the norms approved by the government of India. The Committee shall also be responsible to ensure that the money drawn from the Calamity Relief Fund is actually utilized for the purposes for which the CRF has been set up, and only on items of expenditure and as per norms contained in the guidelines issued by the Ministry of Home Affairs.

The accretions to the CRF, together with the income earned on the investments of the Fund, will be used by the Committee to meet items of expenditure covered by the norms contained in the guidelines released by the Ministry of Finance. No further financial assistance (beyond the central government's yearly contribution to the CRF) will ordinarily be available for the purpose. The expenditure on restoration of damaged infrastructure and capital assets should be met from the normal budgetary heads, except when it is to be incurred as part of providing immediate relief. The provision for disaster preparedness and mitigation needs to be built into the State plans, and not as a part of calamity relief.

The operations of CRF are monitored by the Ministry of Home Affairs. The Ministry shall, *inter alia*, undertake evaluation of the expenditure incurred

out of CRF. Financial assistance is also provided to the States by the National Calamity Contingency Fund (NCCF).

### ***Terrorism Risk Pool***

Following the withdrawal of the cover for the risks of terrorism and sabotage by the international reinsurers, private non-life insurance companies licensed to operate in India have pooled their resources to establish a Terrorism Risk Insurance Pool starting from 1 April 2002<sup>120</sup>.

The Terrorism Risk Insurance Pool fully reinsures all terrorism risks underwritten by the primary companies participating in the venture. Excess of loss retrocessional coverage is then purchased on the international market. The General Insurance Corporation of India (GIC), on behalf of all the non-life insurance companies manages this pool including maintenance of accounts, investment of funds, etc. For this purpose a handling fee of 1 per cent of the premium on the cessions is recovered from the participants. The cover is available only in respect of fire, engineering and fire/engineering sections of miscellaneous policies. The rates charged for this cover are administered by Tariff Advisory Committee (TAC). The entire premium charged for this cover is ceded to the pool after deducting 2 per cent as service charges for the cedant company.

At the beginning, Indian corporations - especially power utilities - were reluctant to take terrorism covers. The few corporations that had decided to purchase terrorism risk coverage included petroleum refiners and some ports<sup>121</sup>. Power utilities' reluctance to take terrorism cover was partly driven by the potential adverse impact on their bottom lines. Insurance costs of power utilities are restricted to 2.5 per cent of the operation and maintenance costs. Consequently, taking terrorism risk implied that the costs of the high premiums would have to be treated as additional expenditure, with the concomitant impact on the rates of return. Few power utilities, especially independent power producers, were prepared to accept this rate of return reduction.

Moreover, domestic insurers were also not very enthusiastic on selling such terrorism risk covers<sup>122</sup>. This was partly because of the steep reinsurance premia and tight caps on maximum reinsurance liabilities. Reinsurers had capped their liabilities to a maximum of Rs 200 crore (USD 43 million). Besides, reinsurers starting from 2002 were not willing to accept terrorism as part of the treaty arrangements any more. As a result, most of the domestic non-life insurers had to pool their risks or take reinsurance on a facultative basis, which were prohibitively expensive.

In a circular issued to all the non-life insurers in the Country, the Tariff Advisory Committee (TAC) of the Insurance Regulatory and Development Authority (IRDA) reduced the premium from 0.05 per cent per mille (50 paise per Rs 1000 of sum assured) to 0.03 (30 paise per Rs 1000). Industry sources said that reduction in the premia was partly driven by the low claims ratios in terrorism insurance. In fact, very few corporations in the country have made claims on terrorism-related losses. The reduction might also be driven by the reduced risk perception and/or reduce cost of international retrocessional coverage<sup>123</sup>. After an initial period in which the maximum coverage per risk was set at Rs. 200 crores (USD 43 million), from January 2004 the Pool had the financial capacity to offer terrorism cover up to Rs. 300 crores (USD 65 million) per location. Along with the above mentioned premium reductions, the coverage limits have been raised first to Rs 500 crore (USD 108 million) per event per location<sup>124</sup>, and then, in June 2006, to Rs 600 crore (USD 130 million)<sup>125</sup>.

## INDONESIA

Due to the geographical location of the Indonesian Archipelago, the Republic of Indonesia is extremely vulnerable to natural catastrophes such as *earthquakes, volcanic eruptions, tsunamis and floods*<sup>126</sup>.

### *PT. Asuransi MAIPARK Indonesia*

PT. Asuransi MAIPARK Indonesia (MAIPARK)<sup>127</sup> was established on 23 December 2003. It commenced business operations with effect from 1 January 2004. MAIPARK is a joint undertaking of the Indonesian General Insurance Industry, endorsed by Decree No. 63 of the Directorate of Insurance, Republic of Indonesia. All insurance and reinsurance companies licensed to operate in the Republic of Indonesia are shareholders of the company. MAIPARK was established as a Special Risk Reinsurance Company with the objective to become the National Reinsurer for catastrophic risks. At present MAIPARK focuses on earthquake reinsurance only.

Deregulation of the financial sector in the late 1980's led to a drop of premium rates in Indonesia to levels similar to countries without catastrophe risk exposure. Due to excessive competition it became market practice to provide earthquake insurance without charging risk adequate premiums. There was increasing concern whether insurers could meet their obligations towards policyholders in the event of a large earthquake impacting one of the major metropolitan or economically and industrially vital provincial areas.

In response to the above situation and via a succession of administrative and regulatory directives, the government required all licensed general insurance and reinsurance companies operating in Indonesia to cooperate in insuring special risks through a joint undertaking of all companies. The vehicle for this undertaking was the Indonesian Earthquake Reinsurance Pool or Pool Reasuransi Gempa Bumi Indonesia (PRGBI). Participating in the Earthquake Pool was made compulsory for all general insurance and reinsurance companies. The PRGBI began operations from 1 January 2003. At the same time a compulsory earthquake tariff was introduced and endorsed by the government. With effect from 1 January 2004 the PRGBI was transformed into a public liability company, MAIPARK.

The earthquake and tsunami event on 26 December 2004 off the coast of West Sumatra, which was widely covered by the international media, will be a lasting reminder of the destructive forces of nature. The insurance industry plays an important role in supporting economic growth by diversifying risks and absorbing volatility. Insurers act like an engine for economic recovery after major natural disasters. The objective is to form a community of insured who pay enough premiums to cover the cost of damage caused by a natural catastrophe.

While insurance cannot prevent natural catastrophes and loss of lives to occur, it can help people protect against the financial consequences of loss or damage to their homes and business by means of buying earthquakes insurance. While insurances offer earthquake insurance, there is no state requirement that consumer purchase earthquake insurance or that mortgage lenders require it. With the help of reinsurers, both local and international, to whom most catastrophe risk is transferred, the insurance industry and the government reduce their respective financial and fiscal risk exposures.

Besides its function as a reinsurer MAIPARK engages in research support, education of the public about natural disaster, risk mitigation and more stringent and safer construction standards and building codes. As a result of the devastating impact of the 26 December 2004 tsunami, insurance companies in Indonesia were faced with a large number of claims, even if insurance penetration in the most affected regions (especially Aceh) is extremely low<sup>128</sup>.

## **PHILIPPINES**

### ***National Calamity Fund (NCF)***

The Philippines have set up a comprehensive all hazard disaster management system (Philippines Disaster Management System - PDMS),

covering mitigation, preparedness, rehabilitation and response<sup>129</sup>. The funding of the response measures is managed through the National Calamity Fund (NCF) and the Local Calamity Fund (LCF).

The National Disaster Coordinating Council (NDCC) administers the NCF under the Philippines' General Appropriation Act. The fund shall be used for aid, relief and rehabilitation services to areas affected by man-made and natural calamities and repair and reconstruction of permanent structures. The limited budget allocation of the national calamity fund prompted the NDCC to rationalize its use so that urgent and immediate needs in affected areas are duly addressed based on the priority levels set. Reportedly, an insurance solution to cover the financial consequences of large scale disasters is currently being considered in the Philippines<sup>130</sup>.

## NOTES

1. In 2004-05, NDRRA expenditures were just under AUD 70m, with most funding going to NSW (receiving just over AUD 38m); Queensland received just over AUD 15m in funding, while Western Australia received over AUD 11m. NDRRA assistance is provided in accordance with terms and conditions determined by the Minister for Local Government, Territories and Roads.
2. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 67 ff.
3. A related point is the issue of non-insurance and underinsurance. The Insurance Council of Australia has estimated that as many as 20 per cent of home buildings are insured for between 70 and 90 per cent of their replacement value and that as many as 25 per cent of home contents may be uninsured, the bulk of which would be rental accommodation.
4. A copy of the code is available at [www.codeofpractice.com.au](http://www.codeofpractice.com.au). Specific provisions are comprised in section 4 of the Code, entitled: "Responding to Catastrophes and Disasters".
5. More information is available at <http://www.insurancecouncil.com.au/>

6. OECD, *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, Paris, OECD Publishing: 2005.
7. The report, released on 15 September 2006, is available at: <http://www.treasury.gov.au/contentitem.asp?NavId=037&ContentID=1162>
8. See: [www.hochwasserrisiko.at](http://www.hochwasserrisiko.at); see also: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 23 ff.;
9. See: D. Hinghofer-Szalkay, and B.A. Koch, AUSTRIA, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, Tort and Insurance Law Vol. 14, Vienna/New York: Springer 2006, 7 ff.
10. OECD, *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, cit.
11. For: “CAstrophes Naturelles / NATuurRAmpen”.
12. The cap is the lesser of: (i) EUR 3.000.000 + 0.35 x P + 0.05 x S; or (ii) 1.05 x (EUR 3.000.000 + 0.35 x P), where: P is the premium income for simple fire insurance (excluding catastrophe coverage) received by the insurance company in the financial year preceding the loss; S is the amount of indemnities that the insurer has to pay for a natural catastrophe in excess of EUR 3.000.000 + 0.35 x P. In case of an earthquake, the coefficient 0.35 and the sum EUR 3.000.000 are respectively replaced by 0.84 and EUR 8.000.000.
13. *“Une action ou une menace d'action organisée dans la clandestinité à des fins idéologiques, politiques, ethniques ou religieuses, exécutée individuellement ou en groupe et attentant à des personnes ou détruisant partiellement ou totalement la valeur économique d'un bien matériel ou immatériel, soit en vue d'impressionner le public, de créer un climat d'insécurité ou de faire pression sur les autorités, soit en vue d'entraver la circulation et le fonctionnement normal d'un service ou d'une entreprise”* (Law 1 April 2007, Article 2, para. 1)
14. See: *OECD Check-List of Criteria to Define Terrorism for the Purpose of Compensation*, Recommendation of the OECD Council of 15 December 2004.
15. See: <http://www.tripasbl.be/>



16. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 9 ff.
17. Once the threshold is exceeded, the federal share of eligible expenses is determined by the formula in the following table:

Eligible Provincial Expense Thresholds (per capita of population)	Government of Canada Share (percentage)
First CAD 1	0
Next CAD 2	50
Next CAD 2	75
Remainder	90

18. See <http://www.2003firestorm.gov.bc.ca/firestormreport/toc.htm>
19. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 29
20. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 51
21. “12. *La Nation proclame la solidarité et l'égalité de tous les Français devant les charges qui résultent des calamités nationales.*” See: M. Cannarsa, F. Lafay and O. Moréteau, FRANCE, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, Tort and Insurance Law Vol. 14, Vienna/New York: Springer 2006, 81 ff.
22. Household insurance coverage is mandatory for tenants under French law, while most lenders require home owners to show proof of adequate insurance in order to obtain a loan.
23. The underground cavities considered may be natural or man-made. In the latter case, damage resulting from the former or current exploitation of a mine is excluded from the application of this special regime.
24. The compensation for such losses is governed by the provisions of Law n.64-704 of 10 July 1964, as amended, which establishes a scheme to cover agricultural disasters (National Guarantee Fund for Agricultural Disasters). See *Code Rural* (Rural Code) Article L361-1 to 21. See: M. Cannarsa, F. Lafay and O. Moréteau, FRANCE, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, cit., 87.

25. Article 1 of the Law 82-600 states: « *Les contrats d'assurance, souscrits par toute personne physique ou morale autre que l'Etat et garantissant les dommages d'incendie ou tous autres dommages à des biens situés en France, ainsi que les dommages aux corps de véhicules terrestres à moteur, ouvrent droit à la garantie de l'assuré contre les effets des catastrophes naturelles sur les biens faisant l'objet de tels contrats. En outre, si l'assuré est couvert contre les pertes d'exploitation, cette garantie est étendue aux effets des catastrophes naturelles, dans les conditions prévues au contrat correspondant. Sont considérés comme les effets des catastrophes naturelles, au sens de la présente loi, les dommages matériels directs ayant eu pour cause déterminante l'intensité anormale d'un agent naturel, lorsque les mesures habituelles à prendre pour prévenir ces dommages n'ont pu empêcher leur survenance ou n'ont pu être prises. (...)*». For the detailed legislative provisions of the French *Insurance Code* currently in force, see: *Code des Assurances* (Partie Législative) Titre II - Chapitre V: L'assurance des risques de catastrophes naturelles (Articles L125-1 to L125-6).
26. Pursuant to a decree of 10 August 1982 (defining standard clauses), the catastrophe insurance guarantee must cover the cost of direct material damage suffered by the property up to the value stated in the policy and subject to the terms and conditions of the said policy at the time the risk first occurs. As anticipated, the natural disaster coverage is also extended to in all business interruption policies; in this case, it covers loss of gross profit and additional operating costs during the indemnity period specified in the policy. Claims are settled on the basis of the "damage" cover under the policy with the widest scope and indemnity is provided in the same way as under the basic cover.
27. These coefficients rise as follows: 1 to 2 declarations: normal application of the statutory deductibles; 3 declarations: doubling of the statutory deductibles; 4 declarations: tripling of the statutory deductibles; 5 or more declarations: quadrupling of the statutory deductibles. See *e.g.*, *Les catastrophes naturelles en France. Natural disasters in France*, CCR: April 2007.
28. See *e.g.* *Les catastrophes naturelles en France. Natural disasters in France*, *cit*; see also: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*.
29. It should be noted that, under French law, insurance and reinsurance companies are allowed to place up to 75 per cent of their profits for each year into an "equalisation reserve" on a tax-free basis provided that the total amount of the reserve does not exceed 300 per cent of their annual income.

The funds that are, each year, allocated to this reserve are released after ten years.

30. *Les catastrophes naturelles en France. Natural disasters in France*, CCR: June 2001.
31. See: Articles L422-1 and L-422-2 of the *Insurance Code*.
32. See: OECD, *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, cit.
33. This provision does not apply to the nuclear accidents defined by the convention on the public liability on nuclear energy signed in Paris on 29 July 1960.
34. See U. Magnus, GERMANY, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, cit., at 123-124
35. See U. Magnus, GERMANY, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, cit., 119 ff.
36. See: OECD, *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, cit.; see also: <http://www.extremus.de>
37. *Mapping the impacts of recent natural disasters and technological accidents in Europe*, Environmental Issue Report n. 35, EEA: 2004. The EEA report brings together information about natural disasters and technological accidents that have occurred across Europe over the 1998-2002 period and their impacts on the environment and society. The natural disasters covered are floods, storms, forest fires, droughts, landslides, snow avalanches and earthquakes. Among technological accidents, oil spills, industrial accidents and mining accidents are considered. The report does not deal with biological hazards (e.g. epidemics), social hazards (terrorism, war) or certain types of technological risks such as nuclear accidents. Nor does it cover hazards related to chronic exposure to harmful substances or transport accidents other than those involving dangerous substances.
38. Source: Servizio Nazionale di Protezione Civile (National Service of Civil Protection). Pursuant to Law n.225 of 24 February 1992, the National Service of Civil Protection is coordinated by the President of the Cabinet of Ministries: <http://www.protezionecivile.it/> see also: *Catastrophes and Insurance in Italy*, Report by Mr. Aldo Marzano, ANIA (Italian National

Association of Insurance Companies) Conference – Milan, 11 November 2003.

39. Sources: Servizio Nazionale di Protezione Civile (National Service of Civil Protection) and ANIA (Italian National Association of Insurance Companies).
40. This problem is common to other Western democracies: as we shall see in more details, *infra*, in the US, government funding of natural catastrophes has been perceived to be an increasingly serious issue. See: G. Priest, *The Government, the Market and the Problem of Catastrophic Loss*, 12 *Journal of Risk and Uncertainty* (1993) 219. See also: K.A. Froot (ed.), *The Financing of Catastrophe Risks*, University of Chicago Press, 1999.
41. Sometimes human misconduct combines with natural phenomena generating catastrophic losses and, thereby triggering liability in tort as well as under criminal law. This is the case, for instance, of the Vajont disaster.
42. See A. Monti and F.A. Chiaves, ITALY, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, cit., 145 ff.
43. See e.g. the Report by Prof. Giovanni Manghetti, former President of ISVAP, at the Conference on “*Catastrophic Events and Connected Consequences. The Insurer’s Approach and the Role of Brokers*”, Rome 31 October 2000.
44. ANIA, *Progetto di classificazione del territorio italiano ai fini della garanzia alluvione*, Milan, 1996, 1-10.
45. Antitrust Authority Bulletin, n. 13-14 of 26 April 1999, 95.
46. Report by Prof. Giovanni Manghetti, former president of ISVAP, at the Conference on “*Catastrophic Events and Connected Consequences. The Insurer’s Approach and the Role of Brokers*”, Rome, October 31, 2000, p. 6 et seq.
47. Antitrust Authority Decision AS270 of 20 November 2003, Bulletin n. 47/2003.
48. The antitrust problem with tie-ins is that the leverage generated by economic power in one market is used by the seller to accomplish sales in another.
49. « *In conclusion, the Authority hopes that the Parliament and the Government, with a view to reforming the current system of compensation for natural*

*catastrophes losses, will make a clear decision between public and private intervention.»* Antitrust Authority Decision AS270 of 20 November 2003, Buletin n. 47/2003, last sentence.

50. Article 1 of the *Disaster Countermeasures Basic Act*: “For the purpose of protecting the national territory, the life and limb of the citizens and their property, this Act shall have for its aim the establishment of a machinery working through the State and local governments and public corporations and the clarification of where responsibilities lie, and provide for the formulation of disaster prevention plans and basic policies relating to preventive and emergency measures and rehabilitation programs to deal with disaster, and other necessary measures as well as financial action, thus ensuring an effective and organized administration of comprehensive and systematic disaster prevention with a view toward the preservation of social order and the security of the public welfare.”
51. According to data provided in June 2008 by the Japan Earthquake Reinsurance Co., Ltd., the penetration rate in 2007 exceeded 20 per cent, reflecting an upward trend that begun in the mid-nineties. Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 81 reports that: “In 1992, for example, just 7 per cent of policyholders purchased earthquake coverage. Since that low, however, the take-up rate has been steadily rising and now stands at 17.2 per cent, its highest level since 1969. Coverage is also available under commercial policies for earthquake shock and fire-following. Historically, the earthquake endorsement gave limited coverage for industrial and commercial risks, mainly on a reduced indemnity basis. However, there has been a recent trend toward the issuance of first-loss (no penalty for underinsurance) or layered coverage on both single- and multiple-location policies. It is now estimated that three-quarters of all commercial and industrial earthquake cover is provided on a first-loss basis.”
52. The most recent amendment was introduced on 1 April 2008 to increase the aggregate limit of indemnity per one event to JPY 5 500 billion. See also: Disaster Risk Management in Japan, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 303 ff.; Guy Carpenter & Co., Inc. (2005), *The World Catastrophe Reinsurance Market: 2005*, 19.
53. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 81.
54. Japan Earthquake Reinsurance Co., Ltd. Annual Report 2007, pp. 3-4
55. Japan Earthquake Reinsurance Co., Ltd. Annual Report 2007, p. 5

56. See *Manual de organización y operación del Sistema Nacional de Protección Civil* available at <http://www.proteccioncivil.gob.mx>.
57. Regulation in Mexico makes it obligatory to contract earthquake and other catastrophic risks' insurance (as well as fire insurance) for the following goods: a) INFONAVIT Housing (Institute of National Workers' Housing Fund), regulated by the Law of the INFONAVIT and the Rules under Financing Auctions for the Building of Housing Sets; b) FOVISSSTE Housing (Institute of Security and Social Services for Government Workers' Housing Fund) regulated by the ISSSTE's Law and the Rules under Financing Auctions for the Building of Housing Sets; and c) Timesharing Houses Regulated according to the Mexican Official Norm Project NOM-029-SCFI-199.
58. See *Bases para el Establecimiento del Sistema Nacional de Protección Civil* (1986), pp. 170-171 at: [http://www.proteccioncivil.gob.mx/upLoad/Publicaciones/1986\\_Bases\\_Sinaproc\\_wdef2sec.pdf](http://www.proteccioncivil.gob.mx/upLoad/Publicaciones/1986_Bases_Sinaproc_wdef2sec.pdf).
59. See: *Disaster risk financing: Reducing the burden on public budgets*, Focus Report, Swiss Re, 2008.
60. See: M. Faure and T. Hartlief, THE NETHERLANDS, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, Tort and Insurance Law Vol. 14, Vienna/New York: Springer 2006, 195 ff.
61. More information can be obtained at [www.civildefence.govt.nz](http://www.civildefence.govt.nz)
62. See: <http://www.eqc.govt.nz/>
63. Perils insured by the EQC catastrophe coverage are: earthquake, natural landslip, volcanic eruption, hydrothermal activity, tsunami and, in the case of residential land, also storm or flood.
64. See: <http://www.naturskade.no/>
65. Largest losses in Norway have been caused by storm and flood.
66. The original name was: *Consortio de Compensación de Riesgos de Motín* - Consortium for the Compensation of Riot Risks.

67. See: The Spanish Experience in the Management of Extraordinary Risks, Including Terrorism, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 337 ff.
68. See: Law 21/1990 of 19 December 1990, amended by Law 30/1995 of 8 November 1995.
69. See Article 1 of the Regulation concerning Extraordinary Risks Insurance (approved by Royal Decree 300/2004, dated 20th February 2004, and amended by Royal Decree 1265/2006, dated 8th November 2006).
70. See: The Turkish Catastrophe Insurance Pool (TCIP) and Compulsory Earthquake Insurance Scheme, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 349 ff.
71. See M. Huber and T. Amodu, UNITED KINGDOM, in M. Faure and T. Hartlief (eds.), *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach*, cit., 261 ff.
72. See Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 60 ff.
73. See: D. Crichton, *Flood Risk & Insurance in England and Wales: Are there lessons to be learned from Scotland?*, Technical Paper 01, Benfield Hazard Research Center, 2005. Available at: [http://www.benfieldhrc.org/activities/tech\\_papers/tech\\_paper1/pages/intro/cover\\_page.htm](http://www.benfieldhrc.org/activities/tech_papers/tech_paper1/pages/intro/cover_page.htm)
74. See: <http://www.abi.org.uk/flooding>
75. Reinsurance (Acts of Terrorism) Act 1993: “*Acts of persons acting on behalf of, or in connection with, any organisation which carries out activities directed towards the overthrowing or influencing, by force or violence, of Her Majesty’s government in the United Kingdom or any other government de jure or de facto.*”
76. See: <http://www.poolre.co.uk>
77. The scheme does not cover property insured under marine, aviation or motor policies and it does not cover property on licensed nuclear sites, for which separate arrangements are in place.
78. If losses should be so large that all Pool Re’s reserves are exhausted by claims made upon it by its member insurers, Pool Re would be able to draw

funds from the UK government to enable it to meet its obligations. Pool Re, in turn, pays a premium to government for this cover, and would be required to repay any funds drawn down in this way from its future income. See: <http://www.poolre.co.uk>

79. OECD, *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, cit.
80. H. Swanson. *The Delicate Art of Practicing Municipal Law Under Conditions of Hell and High Water*. N. Dak. L. Rev. 487, 490 (2000).
81. M. Davis, *The Legal Community's Response to 9/11: Re-envisioning Disaster Legal Relief in the Era of Homeland Security*, 31, Fordham Urb. L.J. 959, 966 (2004).
82. Id. at 967
83. [www.DepartmentofHomelandSecurity/FEMA/history.gov](http://www.DepartmentofHomelandSecurity/FEMA/history.gov).
84. [www.DepartmentofHomelandSecurity/FEMA/mission.gov](http://www.DepartmentofHomelandSecurity/FEMA/mission.gov).
85. Elliston, Jon. A Disaster Waiting to Happen. [www.thebestofneworleans.com](http://www.thebestofneworleans.com)
86. 42 USCS §5121
87. Id.
88. United States Senate, Environment and Public Works Committee Hearing, Testimony by Joe Allbaugh, Oct. 16, 2001. Federal Document Clearing House Congressional Testimony.
89. Clarren, Rebecca. *Program Nixed in 2001 Could Have Curbed Gulf Coast Damage*. The New Standard, Sept. 2005.
90. [www.DepartmentofHomelandSecurity/FEMA/Programs.gov](http://www.DepartmentofHomelandSecurity/FEMA/Programs.gov)
91. The Office of State and Local Government Coordination and Preparedness also assumed several of the responsibilities of the ONP, demonstrating a tension between the distribution of funds for natural hazards programs and anti-terror programs.
92. United States Senate, Environment and Public Works Committee Hearing, Testimony by Joe Allbaugh, Oct. 16, 2001. Federal Document Clearing House Congressional Testimony.



93. National Emergency Management Association, Congressional Testimony, 2005. Federal Document Clearing House Congressional Testimony.
94. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 11 ff.
95. See: R. P. Hartwig and C. Wilkinson, *The National Flood Insurance Program (NFIP)*, Insurance Information Institute, October 2005.
96. See <http://www.floodsmart.gov/>
97. The hurricane season of 2005 generated the largest and costliest flood disaster in the United States' history.
98. See: *CBO's Response to Questions About the National Flood Insurance Program*, 31 May 2006 available at: <http://www.cbo.gov/ftpdocs/72xx/doc7233/05-31-NFIPLetterGregg.pdf>
99. Reportedly, the NFIP has operated on an actuarially unsound basis, with many property owners paying premiums that do not account for the full risk of insuring their properties. See: *CBO's Response to Questions About the National Flood Insurance Program*, cit.
100. The Senate version of the bill was voted on 12 May 2008.
101. The current authorization for NFIP is set to expire at the end of the 2008 fiscal year.
102. Based on data provided by the CEA in 2008, while in the year following the 1994 Northridge Earthquake approximately 35 per cent of homeowners decided to buy earthquake insurance, at present only 12 per cent of California residents purchase coverage. See also: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 13-14.
103. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 14-18.
104. See: OECD, *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, cit.
105. "The White House has criticized proposals to provide a federal backstop for natural catastrophes as totally inappropriate and characterized the insurance availability problems in coastal states as 'self-inflicted', meaning that if a state sets a ceiling on what can be charged and, as a result, insurers are unable

to make a profit and leave the state, the state is to blame. Proposals for a federal backstop generally envisage a three-layer plan: 1) policies sold by individual insurance companies; 2) state or regional catastrophe pools that provide reinsurance to insurers doing business in the state; and 3) a national megacatastrophe fund. Some insurance groups are in favor of a federal role while others are not. Some say that under the current system the federal government (and hence taxpayers) pay for rebuilding in any case through government grants and low interest loans and that the funds would be better spent in an organized and predictable fashion. Other insurers say that worldwide there is enough reinsurance capacity to protect US primary insurers against catastrophe losses and that people who choose to live in disaster-prone areas should not be protected from the cost of their decisions through subsidies from people who choose to live in a less risky location. They believe the solution is for Congress and state legislatures to develop more stringent building codes and tax incentives for homeowners to prepare for hurricanes. If there is a federal role, it should be limited to providing liquidity through temporary loans to state or regional catastrophe pools rather than serving as a reinsurer” See: Insurance Information Institute, *Catastrophes: Insurance Issues*, June 2008, available at: <http://www.iii.org/media/hottopics/insurance/xxx/>

106. Information on this approach is available at <http://www.aiadc.org/aiadotnet> and by going to "Natural Disasters" on the website.
107. See: Reinsurance Association of America, *Government Catastrophe Funds: An Idea That's Bad for America's Insureds*, June 2006. Available at: <http://community.reinsurance.org/StaticContent/Download/govtcatfunds.pdf>  
  
See also:  
<http://www.reinsurance.org/files/public/SmartNatCatPolicyCoalition.pdf>
108. Official Journal L 311 of 14 November 2002.
109. No later than ten weeks after the first damage caused by the disaster, the State affected should submit an application to the Commission for assistance from the Fund. It should provide all possible information on the damage caused by the disaster and its impact on the population and the economy. It must estimate the cost of the foreseen assistance and indicate any other sources of national, Community and/or international funding. Beneficiary Member States must seek all possible reimbursement from third parties.
110. See: <http://www.treif.org.tw/treif/index.asp>

111. In an effort to complement TREIP's reinsurance program and diversify sources of reinsurance capacity, in August 2003 the government successfully issued a landmark USD 100 million catastrophe bond. The three-year bond operated with an indemnity trigger of TWD 20 billion. The bond expired and it was not renewed, due to excessive costs. The layer was then covered by excess of loss (XL) reinsurance.
112. Prior to 1999, fewer than 1 per cent of the residents in Chinese Taipei were covered by earthquake insurance.
113. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 97.
114. See also: Risk Management Solutions, *Creating a Technical Foundation for Earthquake Insurance in China*, RMS (2005), 18.
115. A terrorism risk insurance pool has also been established in Chinese Taipei in 2004. It covers personal accidents up to a maximum insured amount of TWD 2 million per person. See: Guy Carpenter & Co., Inc. (2007), *The World Catastrophe Reinsurance Market: 2007*, 97.
116. See Disaster Management in India, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 381 ff.
117. The salient features of the Bill include setting up of a National Disaster Management Authority under the Chairmanship of the Prime Minister; State Disaster Management Authorities in the States/Union Territories under the chairmanship of Chief Minister or Lt. Governor or Administrator, as the case may be.
118. See:[http://finmin.nic.in/the\\_ministry/dept\\_expenditure/plan\\_finance/FCD/Guidelines-CRF.htm](http://finmin.nic.in/the_ministry/dept_expenditure/plan_finance/FCD/Guidelines-CRF.htm)
119. The State Governments and/or the State level Committees may constitute sub-committees as may be considered necessary by them in connection with the work of the Committee.
120. See: IRDA Journal, Volume III, Number 3, February 2005, p. 23.
121. See: Shivkumar, *General insurers pitching to provide risk cover to port trusts*, The Hindu Business Line, March 28, 2005.

122. See Management of Extraordinary Risks including Terrorism in India. Achievements and Perspectives, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 393 ff.
123. See A. Monti, *Terrorism Coverage in Selected Non-Member Countries*, in *Terrorism Risk Insurance in OECD Countries*, Policy Issues in Insurance n.9, Paris, OECD Publishing: 2005.
124. The changes took effect on 1 February 2005. See: IRDA Journal, Volume III, Number 3, February 2005, p. 23.
125. See Circular TAC/02/06 of 19 June 2006. Available at: <http://www.tac.org.in/gcir2006.html#c1>
126. See Earthquake Risk Management Policy in Indonesia, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 399 ff.
127. MAIPARK is an abbreviation for Maskapai Asuransi Indonesia (MAI) and Perusahaan Asuransi Risiko Khusus (PARK). MAI was the oldest General Insurance Company in Indonesia and its license was purchased by 32 founding shareholders on 23rd December 2003 at a General Shareholder Meeting. See: <http://www.maipark.com/>
128. See: W. Bugl, *Indonesia: The Recent Tsunami – A Review of the Impact and Lessons Learnt*, Asia Insurance Review, Sirc Special Issue, September 2005, 23-25.
129. See Disaster Management Policy in the Philippines, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 411 ff.
130. See Disaster Management Policy in the Philippines, in *Catastrophic Risks and Insurance*, Policy Issues in Insurance n.8, Paris, OECD Publishing: 2005, 415-417.

## CONCLUSIONS

The comparative review and stocktaking conducted in this section of the publication show that there is a wide variety of policy strategies and approaches to the financial management of large-scale disasters, with different degrees of private and public sectors participation and responsibilities, and different types of explicit or implicit coordination mechanisms.

From a normative perspective, bearing in mind that - due to the different exposure to disaster risks, different social and political instances, as well as different legal and cultural backgrounds - finding a standard institutional solution applicable to all countries cannot be the goal of comparative analysis in this field, a clear and transparent allocation of risks and responsibilities among public authorities, firms and individuals emerges as a key component of effective coordination schemes, and a driver to the success of any catastrophe risk management program. Another critical element is the ability to link policy tools (i.e. the technical features of a coordination scheme) with the underlying policy objectives pursued by the government, such as providing adequate financial protection to all individuals and entities, or simply making coverage available.

In those systems that rely on insurance solutions to compensate for property losses due to catastrophes (such as: Belgium, Chinese Taipei, California, Denmark, Florida, France, Iceland, Indonesia, Japan, New Zealand, Norway, Spain, Switzerland, Turkey and the US NFIP), the level of disaster insurance penetration often remains a key concern. Even if disaster insurance coverage is made compulsory by operation of law, the enforcement of the regime may prove to be very difficult (this is the case, for instance, in Turkey), especially if there is a lack of insurance culture among the population. Promoting disaster risk awareness and educating the population to the financial consequences of large-scale disasters becomes, therefore, extremely important. At present, in several countries there seems to be a lack of awareness and a lack of education regarding catastrophic risks: this also applies to central and local governments and the public sector in general.

From a comparative viewpoint, it seems appropriate to distinguish between the situation in developed countries and that in emerging economies. In emerging economies very often the private insurance market is still underdeveloped: the cost of insurance in such economies can be an impediment to growth of the sector<sup>1</sup>. In consideration of the above, alternative risk sharing, risk financing and risk transfer tools, such as micro-insurance solutions at community level, or parametric coverage purchased directly by the government to obtain the necessary liquidity for emergency response measures in case of a disaster, may be more appropriate and easier to implement. Developing countries, furthermore, too often rely on foreign donations to finance rehabilitation and reconstruction: this reduces the incentives to adopt a proactive strategy *ex ante*.

In general, the challenge is to identify financial solutions that provide the right incentives to invest in cost-effective preventive measures with a view to reducing vulnerability and the total cost of disasters. The total cost of disasters is the sum of the cost of disaster losses (insured and uninsured), the cost of preventive measures to avoid or mitigate disaster losses, and transaction costs (i.e. the costs of implementing the scheme)<sup>2</sup>. On the other hand, it is important to bear in mind that public and private investments in disaster risk reduction and mitigation measures, by limiting exposure and vulnerability to disaster risks, facilitate the development of new risk financing, risk sharing and risk transfer tools. In light of the above, it becomes clear that disaster risk reduction, mitigation and financing efforts are closely linked to one another, and should be carefully coordinated by policymakers.

The financial management of large-scale catastrophes has become a central topic in the political agenda of OECD and non-member countries worldwide. The situation is rapidly changing in several legal systems and this confirms the need for constant monitoring and information sharing, with a view to being able to learn from the experience of others. Notwithstanding the differences in the policy approaches and in the various institutional solutions adopted by the countries under review, it clearly emerges that disaster insurance is called upon to play an increasingly important role in this field, with the aim to minimize the total costs of disasters and to highlight the importance of individual responsibility in disaster prevention and mitigation.

## NOTES

1. In emerging economies, one of the most critical financial threats is the exposure of households and SME. SME, in particular, play a crucial role in many emerging economies and it takes a long time to restart their operations after a major disaster. This also entails additional indirect costs (*e.g.* unemployment, loss of tax revenues, trade disruption, etc.).
2. See: G. CALABRESI, *The Cost of Accidents: A Legal and Economic Analysis*, Yale University Press, 1970.

Table 1

**NATURAL CATASTROPHE INSURANCE SCHEMES IN SELECTED OECD  
AND NON MEMBER ASIAN COUNTRIES: COMPARATIVE TABLE.**

	<b>Year</b>	<b>Perils Covered and Triggers</b>	<b>Compulsory Nature</b>	<b>Role of Public and Private Sectors</b>	<b>Financial Capacity</b>
<b>BELGIUM</b>	2006	Earthquake, flood, storm, landslide and ground subsidence.	Compulsory natural disaster extension on all property damage policies purchased on the voluntary market.	Loss-sharing arrangement between the private sector and the public sector. The <i>Caisse nationale des calamites</i> acts as reinsurer of last resort.	The intervention of the <i>Caisse nationale des calamites</i> is limited on a per event, market aggregate basis, to EUR 700 million in case of earthquake and to EUR 280 million for the other natural catastrophes covered. If this ceiling is reached, the indemnity to be paid to the insured parties is reduced proportionally.



	Year	Perils Covered and Triggers	Compulsory Nature	Role of Public and Private Sectors	Financial Capacity
<b>CALIFORNIA</b> CALIFORNIA EARTHQUAKE AUTHORITY (CEA)	1996	Earthquake losses.	California law requires all insurers to offer earthquake insurance with every homeowners policy.	The CEA is a privately financed, state-run insurance program.	The State offers not guarantee; if losses exhaust the CEA fund, claims will be paid out on a pro-rated basis.
<b>CHINESE TAIPEI</b> CHINESE TAIPEI RESIDENTIAL EARTHQUAKE INSURANCE POOL (TREIP)	2002	Earthquake shock and, if caused by earthquake: fire or explosion; landslide, land subsidence, earth movement and rupture; tidal wave, surge and flood.	Compulsory earthquake extension on all fire policies.	The pool is designed to share earthquake risk between private insurance companies and the government and to diversify such risk through a combination of local co-insurance, a non-profit fund, international reinsurance and government funds.	TWD 60 billion.  In the event that losses exceed the capped amount, the losses paid to policyholders will be proportionally reduced (proration).
<b>DENMARK</b>	1991	Losses resulting from the floods caused by overflowing of sea and windstorm damage in woods. An official declaration of the	All property insured against fire is automatically covered by the scheme.	The scheme is administered by the Storm Council ( <i>Stormrådet</i> ), a central government entity assisted by the	N/A

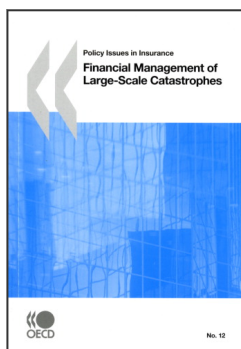
	Year	Perils Covered and Triggers	Compulsory Nature	Role of Public and Private Sectors	Financial Capacity
		Storm Council is required to trigger coverage under the scheme.		insurance companies.	
<b>FLORIDA HURRICANE CATASTROPHE FUND (FHCF)</b>	1993	Hurricane Losses. The Fund reimburses a fraction of insurers' losses caused by severe hurricanes, declared by the National Hurricane Center.	Contribution to the Fund is compulsory for insurers that write primary coverage on personal and commercial residential properties.	The FHCF is tax-exempt. The private industry is responsible for losses up to a certain level.	An important provision limits the Fund's obligation to pay losses to the sum of its assets and borrowing capacity.
<b>FRANCE NATIONAL DISASTER COMPENSATION SCHEME (CAT NAT)</b>	1982	Natural disasters in general. Coverage is triggered when the state of natural disaster is declared by inter-ministerial decree.	Law n. 82-600 of 13 July 1982 provides for a compulsory natural disaster extension on all property damage policies purchased on the voluntary market.	Primary disaster coverage is offered and managed by private carriers, as an extension to property damage policies. Private insurers can obtain full catastrophe reinsurance from the <i>Caisse Centrale de Réassurance</i> (CCR), a state-owned company.	Thanks to the government guarantee, CCR is able to offer catastrophe reinsurance without limits.

	Year	Perils Covered and Triggers	Compulsory Nature	Role of Public and Private Sectors	Financial Capacity
<b>ICELAND</b> ICELAND CATASTROPHE INSURANCE	1975	Earthquake, volcanic eruption, snow avalanches, landslides and floods.	Purchase of catastrophe insurance is mandatory.	Iceland Catastrophe Insurance is a publicly run company.	ICI is liable, for each individual event, for up to 1 per cent of total insured capital at the time of the loss event.  Should the total of payable claims in Iceland exceed this amount, the claims of all of the insured are proportionately reduced.
<b>JAPAN</b> JAPANESE EARTHQUAKE REINSURANCE (JER)	1966	Earthquake, tsunamis, volcanic eruptions	Not compulsory. Primary carriers sell earthquake policies with large deductibles on the voluntary market and then reinsure with JER.	JER, a government entity was established by law in 1966. JER retrocedes part of the risk to the Japanese government and part of it to the private insurance market.	JPY 5,500 billion: if the ceiling is reached, residential policyholders' claims are proportionately reduced. JER's solvency is not guaranteed, but it is improved by arrangements with the Japanese government.

	Year	Perils Covered and Triggers	Compulsory Nature	Role of Public and Private Sectors	Financial Capacity
<b>NEW ZEALAND</b> EARTHQUAKE COMMISSION (EQC) NATURAL DISASTER FUND	1994	Natural disaster losses. Including: earthquake, natural landslip, volcanic eruption, hydrothermal activity, tsunami and, in the case of residential land, also storm or flood.	Automatic earthquake coverage upon purchase of fire insurance from private market. Premiums are added to the cost of the base policy and passed on to EQC by the insurance company.	EQC, a Crown Entity, administers the natural disaster insurance scheme by: collecting premiums via insurance companies; processing claims; administering the disaster fund; organizing reinsurance.	The Government guarantees that the natural disaster fund will meet all its obligations.
<b>NORWAY</b> NORWEGIAN NATURAL PERILS POOL	1979	Landslide, storm, flood, earthquake and volcanic eruption.	Compulsory natural disaster extension on all fire policies purchased on the voluntary market. All fire insurers are obliged to become members of the Pool.	Insurance coverage offered by the Pool is complemented by the Norwegian National Fund for Natural Damage Assistance.	NOK 12.5 billion
<b>SPAIN</b> CONSORCIO DE COMPENSACIÓ N DE SEGUROS	1954	Extraordinary Risks: <u>natural events</u> (flood, earthquake, seaquake, volcanic eruption, atypical cyclonic storm and fall of sidereal bodies and meteorites)	The extraordinary risk coverage offered by the <i>Consorcio</i> is compulsorily linked with a base policy.  The <i>Consorcio</i> 's	Extraordinary risk insurance is administered directly by the <i>Consorcio</i> , a state-owned enterprise, whose solvency is guaranteed by the	Financial capacity is unlimited due to a state guarantee

	Year	Perils Covered and Triggers	Compulsory Nature	Role of Public and Private Sectors	Financial Capacity
		<p>and <u>socio-political events</u> (including riots and terrorism)</p> <p>The event is covered if it occurred in Spain and caused injuries and damage to people and assets in Spain, provided that: (a) the risk is not expressly covered by the base policy; (b) the risk is covered by the base policy, but the company cannot face its obligations.</p>	<p>surcharge is automatically included in the base policy's premium.</p>	<p>State.</p>	
<p><b>SWITZERLAND</b> <b>NATURAL PERILS POOL</b></p>	<p>1939</p>	<p>Flood, inundation, windstorm, hail, avalanche, snow pressure, rock and stone fall, and landslide</p>	<p>Natural perils coverage is mandatorily included in fire insurance for buildings and chattels.</p>	<p>The scheme is administered by private insurance companies</p>	<p>N/A</p>

	Year	Perils Covered and Triggers	Compulsory Nature	Role of Public and Private Sectors	Financial Capacity
<p><b>TURKEY</b> TURKISH CATASTROPHE INSURANCE POOL (TCIP)</p>	2000	Earthquake losses.	Compulsory. Since 2000, earthquake insurance has been made compulsory to all registered residential dwellings in Turkey.	The TCIP is a separate state-owned legal entity, managed by a Council. Local insurance companies act as distributors of the TCIP policies. Excess coverage could be obtained on a voluntary basis from the private market.	N/A
<p><b>UNITED STATES</b> NATIONAL FLOOD INSURANCE PROGRAM (NFIP)</p>	1968	Flood losses.	Not compulsory. The NFIP makes federally-backed flood insurance available in communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage.	The federal government reinsures 100 per cent of the losses at subsidized rates.	Coverage limits offered under the NFIP depend on the community's level of qualification. After the 2005 hurricane season, the NFIP's financial situation became difficult to sustain.



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