

INTOSAI



# *Appendix to ISSAI 5510*

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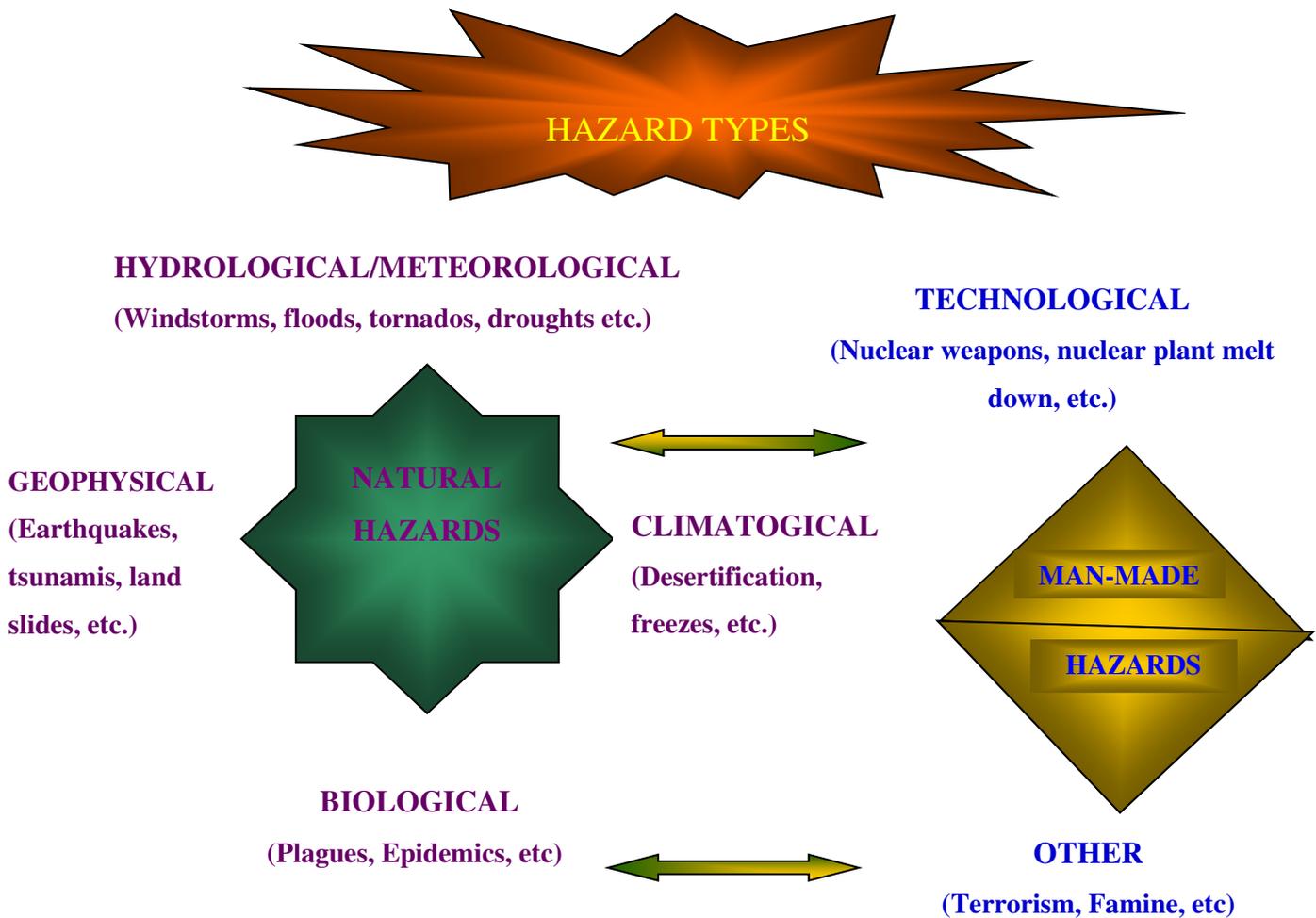
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## Appendix 1

### The relationship between natural and man-made hazards

1. The distinction between natural and man-made hazards is not always clear-cut. For example, human action (or inaction) can have a significant positive or negative impact on naturally occurring hazards. The following diagram shows the relationship between natural and man-made hazards.

#### Hazard Types



Source: Prepared for WG AADA by the SAI of Turkey

2. Examples of the impact human decisions and activities can have on natural disasters:

- The destruction of the natural environment because of logging or inappropriate land uses for short-term economic gain is one of the major factors causing floods or mudslides;
- the migration of populations to urban and coastal areas increases human vulnerability to disasters;
- when population densities increase infrastructure becomes overloaded, living areas move closer to potentially dangerous industries, and more settlements are built in fragile areas such as floodplains or areas prone to landslides;
- poor economic planning and mismanagement of natural resources – for example using farm land for urban development – can lead to widespread famine.

As a result, natural hazards affect more people and economic losses increase in both lower income and high income countries.

3. The large majority of disasters are events of hydro-meteorological origin such as floods, droughts and windstorms.<sup>1</sup> Events of geological origin such as earthquakes are secondary to these. Disaster risks arise when hazards interact with physical, social, economic and environmental vulnerabilities. For example, despite the fact that seismic activity has remained constant over recent years, the effects of earthquakes on the urban population appear to be increasing.

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<sup>1</sup> <http://www.preventionweb.net/english/hyogo/gar/2011/en/what/index.html>

## Appendix 2

### The importance of governance

#### Governance

1. Governance can be defined as “*rules, processes and behaviour that affect the way in which powers are exercised [...] particularly as regards openness, participation, accountability, effectiveness and coherence*<sup>2</sup>.”
2. An analysis of governance focuses on the formal and informal participants in decision-making and implementing the decisions made and the formal and informal structures that have been put into place to arrive at and implement the decision. Government is one of the participants in the governance framework. Others may include NGOs, research institutes, international donors, finance institutions and political parties. Each of these can have a role to play in decision-making or in influencing the decision-making process.
3. Five important characteristics of good governance are participation, accountability, effectiveness, coherence and openness. Although good governance may be difficult to establish, its achievement should be a goal for those involved in preparing for disasters.



### An example of governance structure

#### The Federal Emergency Response Management System Governance Structure-Canada<sup>3</sup>

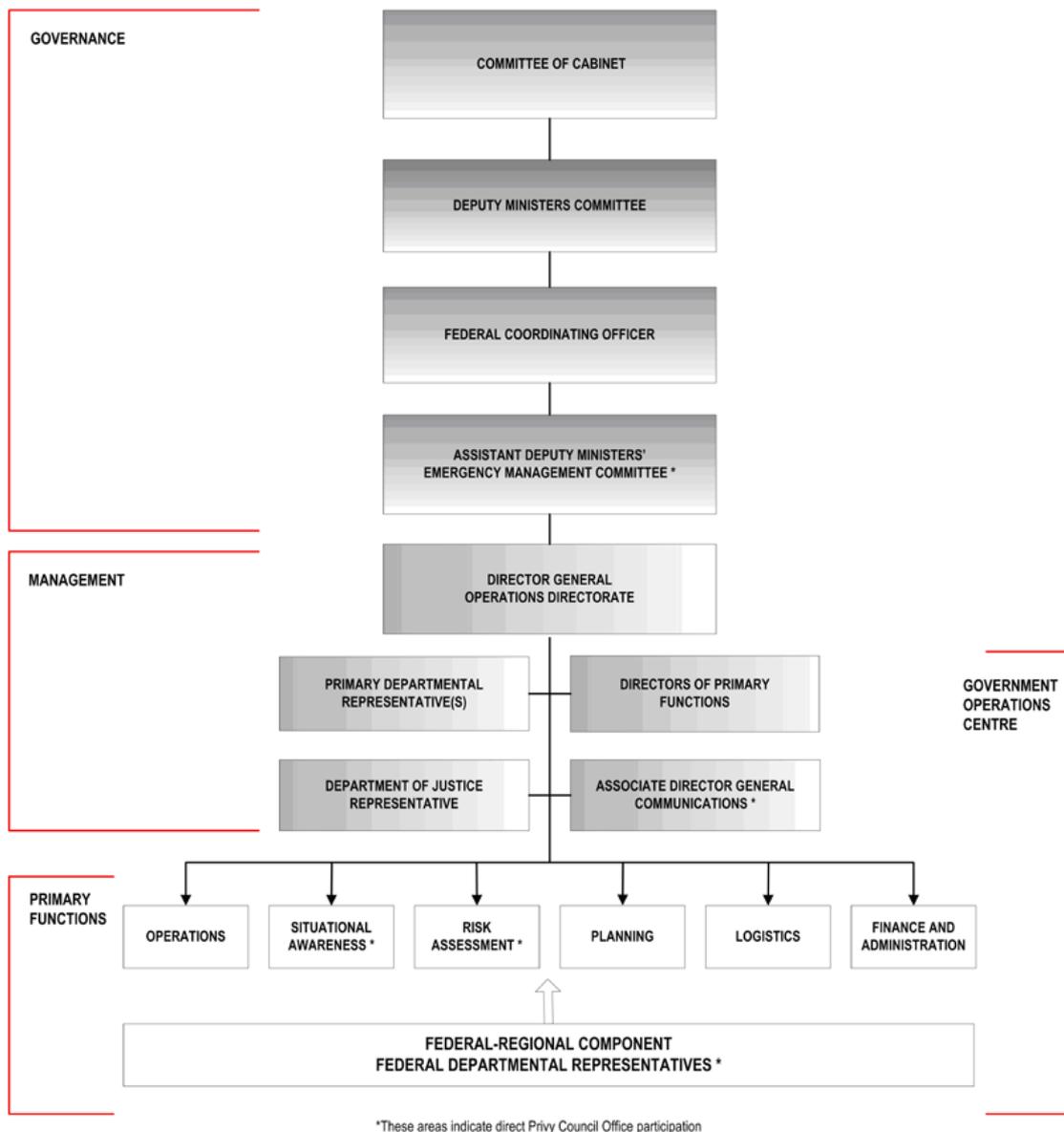
Canada’s Federal Emergency Response Plan (FERP) includes the Federal Emergency Response Management System (FERMS), a comprehensive management system for an integrated response to emergencies. This system provides the governance structure and the operational facility to respond to emergencies. The following figure describes the governance structure:

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<sup>2</sup> European governance white paper, Commission of the European Communities, Brussels, COM(2001) 428 final

<sup>3</sup> Federal Emergency Response Plan, CANADA. <http://www.publicsafety.gc.ca/prg/em/ferp>

## The Federal Emergency Response Management System Governance Structure



### Governance

- Governance here refers to the management structures and processes that are in place during non-emergency and emergency circumstances. The Committee of Cabinet, the Deputy Ministers' Committee, the Federal Coordinating Officer and the Assistant Deputy Ministers' Emergency Management Committee are identified as the highest level decision-makers. These committees are at the ministerial level to coordinate the Government of Canada's response. For the disaster risk reduction phase, the Committee of Cabinet coordinates the government's agenda, including legislation, planning and management issues. The Committee of Deputy Ministers also provides a forum to address public safety, national security and intelligence issues and discuss emergency management and readiness.

### *Management*

5. At the second level, there is a management team that is responsible for the actions and functions of FERMS. The management team conducts the completion of the objectives set for each operational period. The management team consists of the Director General of the Operations Directorate, who leads the management team, and four representatives.
  - The Operations Directorate is part of the coordinating department of Minister of Public Safety. It is responsible for management functions and works together with the Government Operation Centre.
  - Another representative from the Department of Justice or other related institutions provides support and advice on legal issues.
  - Another member of the management team provides support for communication issues.
  - The primary departments, designated in accordance with the nature of the emergency, are federal departments relating to a key element of an emergency. The primary departmental representatives inform the management team of the support needs based on the nature of the emergency, the Director General of the Operations Directorate, in consultation with the Federal Coordinating Officer, determines which departments are to provide a primary departmental representative to support response within the GOC.
  - Within the management team, four directors from the Operations Directorate are responsible for the primary functions. The directors guide departmental representatives through the process.

### *Government Operation Centre*

6. Public Safety Canada, which is responsible for disaster management, has an operations centre (the Government Operation Centre or GOC) to coordinate the national response. The Government Operation Centre is the hub of a network of operations centers run by a variety of federal departments and agencies including the Royal Canadian Mounted Police (RCMP), Health Canada, Foreign Affairs and International Trade Canada, The Canadian Security Intelligence Service (CSIS) and National Defense. The GOC also maintains contact with the provinces and territories as well as international partners such as the United States and NATO. The GOC's primary functions are providing coordination between federal emergency response partners and guiding them.
7. The GOC communicates the FERP engagement and the response level to the government's emergency response partners. Three response levels are intended to provide a logical progression of activity from enhanced monitoring and reporting to an integrated federal response. At level 1, there is an incident or event which has the potential to require an integrated federal response. At this level, the GOC collects a wide range of information about the incident and it then evaluates and shares this information with the federal emergency response partners. Finally, it is expected that the GOC's information and enhanced reporting efforts should support the federal partners' planning and response activities. At level 2, response requires a full understanding of an incident and, as it unfolds and the requirement for a federal response appears more likely, a risk assessment is performed. This assessment, identifies vulnerabilities, aggravating external factors and potential impacts, and may be formalized in an Incident Risk Analysis Report. At level 3,

there should be an integrated response activity and this level includes the previous two levels' activities. The GOC maintains coordination and constant communication with the federal centres. It also provides regular situation reports for ministers and senior officials.

#### *Primary Functions*

8. Public Safety Canada carries out six primary functions to integrate federal response:

- Operations,
- Situational awareness,
- Risk assessment,
- Planning,
- Logistics,
- Finance and administration.

The scope of the emergency will determine the scale and level of engagement of each of these functions. Within the GOC, subject matter experts and Liaison Officers from government departments, NGOs, and the private sector organize and perform the primary functions. For disaster risk reduction activities, operations, situational awareness, risk assessment and planning functions are of vital importance.

#### *Federal-Regional Component*

9. Federal organization has regional components to communicate with provincial/ territorial authorities. These regional components provide direction on emergency management planning and preparedness activities. They also manage the flow of information and requests for federal assistance within the region. Thus, disaster risk reduction activities are provided in a more effectively and timely manner according to the Government of Canada.

## Appendix 3

### Disaster Management Plans

1. Disaster management plans set out strategic priorities, responsibility for coordinating disaster management activities and the operational details of disaster management. Sometimes all of this information is contained in a single National Disaster Plan. More often, however, the operational detail is covered in separate Sub Plans.

#### *National Disaster Plans*

2. Disaster management activities, including those which involve disaster risk reduction, are carried out at many different levels, and by many different organisations and individuals. The main components of a national plan are:

- *The national strategy:* When determining the national strategy, it is important to assess the risks in terms of existing weaknesses and potential threats with which the country may be faced. Hazard mapping, disaster databases, cost-benefit and impact analysis including an assessment of the annual average and probable maximum losses are tools which can be used for carrying out risk assessments.
- *Priorities:* In the context of disaster management planning, priorities are set using the results of risk assessments. When designing national disaster plans, it is of primary importance that priorities should be determined, taking account of limited resources.
- *Governance structure:* Governance is a key to the effective implementation of disaster risk reduction plans and involves predefined and clear relationships and responsibilities between different levels of government. The governance framework provides the structure through which objectives are set, the means for achieving those objectives are decided and the extent to which achievements are monitored. National plans record the primary functions of disaster management, the organisations that are responsible for performing these functions and responsibilities for different areas. There is no single model of good governance for disaster risk reduction. Auditors should examine the legal, institutional and regulatory framework to help identify the prerequisites for good governance.
- *Coordination:* Comprehensive coordination at all stages of disaster management (pre, during and post disaster) is essential for carrying out activities and meeting responsibilities that are shared among many institutions. National plans provide for coordination tools, such as meetings and committees.
- *Guidance:* National disaster plans guide the responsible institutions in their disaster management work. The aims, goals and risk assessments etc. contained in operational or sub plans should derive from and be aligned with the strategy set out in the national plan. Planning, monitoring and reporting by the main institution(s) responsible for national disaster planning are thus of key importance and should be adequately resourced.

<p>In Canada, strategies are determined and action plans are designed for 10 sectors which are prioritized as “critical infrastructure”. The sectors include Health, Information and Communication, Technology, Energy and Utilities.</p>
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### Sub-Plans

3. In addition to national disaster plans, the individual entities that are responsible for different elements of disaster management draw up plans and programmes related to their own fields of responsibility. These plans can vary depending on the entity concerned and on disaster types. Some examples are as follows:

- *Departmental, operational or emergency management plans*, prepared by institutions/local authorities;
- *Specific plans or strategies*, designed for specific disasters to which countries attach importance;
- *Business continuity plans* which are related to disaster preparation<sup>4</sup>; and
- *Action plans* which will be applied during a disaster.

In Canada, a “National Disaster Mitigation Strategy” is prepared and the mitigation activities are carried out in accordance with this plan. Similarly, one of India’s disaster risk reduction plans is “Preventive/Protection and Mitigation from Risk of Tsunami”

Disaster risk reduction activities included in disaster sub-plans may be the following:

- *Coordination:* Coordination between national plans and sub-plans is of key importance. In order for there to be effective disaster management, including preparedness, activities such as policy, planning, risk assessment, training, public awareness-outreach and protection of critical infrastructure need to be carried out in a coordinated manner by the stakeholders in the field. For example, in Turkey, the “Istanbul Provincial Disaster and Emergency Directorate” was established with the main purpose of ensuring coordination and cooperation between the relevant institutions in the region.
- *Risk assessment:* The sub-plans specify probable risks (generally the risk assessment tool for natural disasters is hazard mapping and for man-made disasters the appropriate tools are monitoring and reporting). In addition, vulnerability assessments

In Canada, a “*Federal Emergency Response Management System*” has been established and the coordination tools and processes are defined within this structure. On the one hand, “*the management team*”, which is composed of delegates of the institutions involved in disaster management, collects the needs of the actors. On the other hand, it issues guidance to them regarding cooperation and coordination.

#### **Tools for assessing Tsunami Risk in India**

- Tsunami Hazard Map
- Tsunami Vulnerability Assessment
- Tsunami Risk Assessment
- Practical Applications

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<sup>4</sup> See guidance prepared by the Capacity Building Committee on this <http://cbc.courdescomptes.ma/index.php> The Capacity Building Committee prepared and published this guide in association with the Pacific Association of Supreme Audit Institutions and the Caribbean Organization of Supreme Audit Institutions.

are also drawn up. For the purposes of these assessments, preparedness is tested through practical applications.

- *Training:* Training is another important issue covered by sub-plans. Many countries have a training unit which organises the training activities related to each stage of disaster management. For example, the Emergency Management Institute in Australia has such a training unit. Additionally, sub-plans emphasize the need to prepare training programmes concerning specific subjects.
- *Public awareness:* In the context of disaster preparedness, public awareness concerning disasters should be raised with a view to reducing the adverse effects of disasters. Raising public awareness requires cooperation and co-ordination between all stakeholders including those from the private sector and NGOs. For this purpose, disaster guidelines giving information and advice about the actions to be taken before, during disaster and after disaster are prepared and educational public awareness-raising programmes are organised.
 

In Australia “Emergency Action Guides” are developed and each action guide offers clear and concise information on how to be prepared, what to do during a major hazard, and what steps to take afterwards.
- *Critical Infrastructure:* This is a service, facility, or a group of services or facilities, the loss of which will have severe adverse effects on the physical, social, economic or environmental well-being or safety of the community. The risks to critical infrastructure have to be identified and managed in an appropriate way. To reinforce the critical infrastructures by minimising the risks affecting them, cooperation between government, the owners of the critical infrastructure and private business managers is important.
- *Measures:* Operational plans should itemise measures to be taken during the disaster management process, such as structural measures including the reinforcement of existing buildings, the construction of disaster-resistant buildings and the evacuation of residential areas before and/or during disasters.

## Appendix 4

### Geographical Information Systems (GIS)

1. GIS are used in areas such as cartography, remote sensing, land surveying, utility management, navigation, geography, urban planning and emergency management. GIS technology enables users to create their own searches and analyse spatial information, edit data and maps and present the results of all these operations. In addition to being one of the most important tools for effective disaster management, development planning and decision making, it is also an important tool for SAIs auditing disaster risk reduction.
2. India and China are among the countries which suffer from the most severe natural hazards in the world. In order to keep the information flowing smoothly into the networks for earthquake preparedness and rescue, their governments have started a series of programmes to set up digital networks. These digital networks, which are based on GIS, GPS and RS, incorporate the latest developments in earthquake engineering and information science. The two examples below illustrate practical applications of GIS for disaster risk reduction.

Vulnerability Atlas of India <sup>5</sup>	China GIS Activities <sup>6</sup>
<p>In 1997, a “Vulnerability Atlas” was prepared, taking into account the three natural hazards which are the most damaging to India: earthquakes, cyclones and floods. The zoning maps at macro level for the three hazards were already available on a small scale for the whole country. These maps were prepared on a larger scale, showing each administrative unit and the district boundaries, for easy identification of the areas covered by the zones at different levels of risk. The Vulnerability Atlas feeds into State-level Disaster Management Planning. It contains the following information for each State and Union Territory of India:</p> <ul style="list-style-type: none"> <li>• seismic hazard map</li> <li>• cyclone and wind hazard map</li> <li>• flood prone area map</li> <li>• housing stock vulnerability table for each district, indicating for each house type, the level of risk to which it could be subjected sometime in the future.</li> </ul>	<p>In recent years, as a part of “Digital Earth” and China's National Information Infrastructure (CNII) project, the earthquake disaster mitigation system has collected a great deal of information on the whole country. This includes information on the geological structure, past earthquakes, buildings and population distribution. Most cities with a population of over 500,000 have constructed an information system to help prepare for earthquakes and other hazards. These contain information on the urban infrastructure, such as the water-supply network, power systems, telecommunication networks, traffic systems, etc. The latest achievements in earthquake engineering continually add to this system, such as earthquake risk analysis methods, new anti-seismic criteria or codes, new knowledge and experience in pre- and post-earthquake emergencies.</p>

<sup>5</sup> Rego Aloysius J., “National Disaster Management Information Systems & Networks: An Asian Overview”, p.4.

<sup>6</sup> [http://www.gisdevelopment.net/application/natural\\_hazards/earthquakes/ma03135b.htm](http://www.gisdevelopment.net/application/natural_hazards/earthquakes/ma03135b.htm)

3. GIS can be used when drawing up disaster risk reduction plans to analyse an almost unlimited number of factors associated with historical events and existing conditions, including actual land use, condition of infrastructure, etc. Planners can use this information to draw up specific mitigation strategies for disaster prevention activities. At the national level, GIS can be used to familiarise planners with the potential disaster area, providing a reference for the overall hazard situation and helping to identify areas that need further study to assess the effect of natural hazards on natural resource management and natural resource development potential.<sup>7</sup> For example, in Indonesia, GIS is used to develop risk maps at national, provincial and district level. The national and provincial-level maps are used to determine priority provinces and areas for disaster management activities, planning and the installation of early warning systems, whereas the district-level maps are used for district contingency planning. Under this system, a number of modules on Forest Fires, Earthquakes/Tsunami, Volcanic Eruption and Social Unrest have been developed to build a web-based database system.<sup>8</sup>
4. Before acquiring a GIS, planners need to determine how their planning activities and decisions will be assisted by using GIS. Specific objectives and applications of the GIS should be defined. The way in which GIS is structured and used differs from country to country according to the disaster risks which the countries face. For example, to understand the full short and long-term implications of “floods” and to plan accordingly, combined data on “meteorology, topography, soil characteristics, vegetation, hydrology, settlements, infrastructure, transportation, population, socio-economics and material resources” need to be analyzed. These resources vary, and in the field of disaster management they are easily processed with the help of GIS and are used in the areas such as making “risk and threat analysis” and carrying out the “planning” efforts. The following example shows use of GIS in disaster risk reduction planning.

**Turkey, Marmara Region Earthquake Preparedness Activities<sup>9</sup>**

In 1999 an earthquake caused large losses over a wide area in the Marmara Region of Turkey. Since then, earthquake activities in this region have been monitored regularly by the “Head of Disaster and Emergency Management of the Prime Minister’s Office”, which is the body responsible for disaster management across the country. In May 2010, an “earthquake danger and risk analysis” was made over a 100 km radius. It estimated that, over a 10-year period, the probability of an earthquake with a magnitude of 6 occurring was 83.8 %.

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<sup>7</sup> Primer on Natural Hazard Management in Integrated Regional Development Planning, “Geographic Information Systems in Natural Hazard Management”, <http://www.oas.org/DSD/publications/Unit/oea66e/begin.htm#Contents>

<sup>8</sup> Rego Aloysius J, “National Disaster Management Information Systems & Networks: An Asian Overview”, p.3.

<sup>9</sup> From the parallel audit on disaster preparedness of the Turkish Court of Accounts 2011-2013. See WG AADA final report for more details

These data, which were produced with the help of the GIS, are used for regional planning. The protection band, which is seventy five metres from each side of the fault zone, has decreased by twenty five metres on each side, so a total 50 metre protection band is specified. In a situation such as this, disaster risk reduction auditors should determine whether the technical data available to planners at this stage was successfully incorporated into the planning process.

5. When conducting disaster risk reduction audits, SAIs should evaluate whether the current GIS makes the evaluation of risk assessments, risk analysis and vulnerability assessments easier, and also whether or not existing GIS elements are suitable for use in the process of disaster risk reduction. This is very important for assessing risk mitigation strategies and activities and in evaluating whether efficient and effective use is made of GIS. See ISSAI 5540 for guidance on using and auditing the use of GIS in disaster risk reduction.<sup>10</sup>

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<sup>10</sup> <http://www.issai.org/composite-280.htm>

## Appendix 5

### The organisation and structure of authorities involved in disaster risk reduction

Summary of an audit report carried out by the Turkish Court of Accounts

#### *How well is Istanbul getting prepared for the earthquake? (2002)*<sup>11</sup>

According to Turkey's current legal arrangements, the main authority responsible for disaster risk reduction is the Turkey Emergency Management Directorate General (TEMAD) attached to the Prime Minister's Office. This body has been charged with preparing and executing disaster plans and taking the necessary measures to provide effective emergency management nationwide and coordinating all the bodies involved. The other organisations responsible for disaster activities are:

- the Ministry of the Interior, which has set up regional centres for relief and emergency operations.
- the Independent National Earthquake Council.
- local authorities, whose responsibilities for disaster mitigation were extended after the TCA report recommendations.

The activities of Turkish NGOs are all coordinated by TEMAD. These include the Turkish Red Crescent, the Association of Social and Economic Solidarity with Pacific Countries, the Turkish Blue Crescent Association, the Foundation for Human Rights, Humanitarian Relief and other government institutions.

Against this background, the TCA audited earthquake preparedness using the following questions:

- Does the organizational structure charged with earthquake preparedness for Istanbul measure up to the needs?
  - ✓ How does the organisational structure prepare Istanbul for earthquake?
  - ✓ How are resources allocated for earthquake preparedness?
  - ✓ Is effective coordination and cooperation established?
  - ✓ Are activities properly planned and executed?
  - ✓ Is there sufficient work related to post-earthquake fires that increase initial damage?
  - ✓ How well do service groups prepare their emergency plans?

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[http://www.savistay.gov.tr/english\\_tca/Performance/IstanbulEarthquake.pdf](http://www.savistay.gov.tr/english_tca/Performance/IstanbulEarthquake.pdf)

## Appendix 6: Audit Objectives - examples concerning disaster risk reduction

Country	Background/Title	Audit Type/ Disaster Phase	Audit Objective
<i>Austria</i>	Prevention of Natural Hazards: Use of resources from the disaster fund	Preparedness- Mitigation/ <i>Performance</i>	Evaluation of distribution and use of resources from the disaster fund; decision-making approaches, division of functions and coordination between federal, regional and local authorities.
<i>Canada</i>	Fall 2009 Emergency Management – Public Safety Canada	Preparedness- response/ <i>Performance</i>	The objectives of this audit were to determine whether Public Safety Canada can demonstrate that it has exercised leadership by coordinating emergency management activities, including critical infrastructure protection in Canada; and determine whether Public Safety Canada, along with federal departments and agencies, can demonstrate progress in enhancing the response to and recovery from emergencies in a coordinated manner.
<i>Czech Republic</i>	Funds spent on anti-flood measures and prevention in areas endangered by adverse climate changes. The audit is focused on finance for flood prevention and protection (meteorology and hydrology systems, risk of landslides and rock collapses, mapping flood areas, mapping proneness to landslides and rock slides, flood risk evaluation).	Preparedness/ compliance- performance	Economy, effectiveness, efficiency of finance for flood protection.
<i>Lesotho</i>	The Distribution of Food Relief Aid	Mitigation/ Performance	To determine factors affecting the efficient distribution of food relief aid
<i>Netherlands</i>	Preparation for disaster management.	Preparedness/ Performance	Audit as to whether the minister of Home Affairs has fulfilled his responsibility for the organization of disaster management in the Netherlands.
<i>Turkey</i>	How Well Is Istanbul Getting Prepared for the Earthquake?	Preparedness/Pe rformance	To specify the risks faced during the short and medium-term preparatory works aimed at minimizing possible Istanbul earthquake damage and identifying the measures to be taken.

## Appendix 7

### Audit Questions and Criteria for the WG AADA parallel audit on disaster risk reduction

The following questionnaire was drafted for use during by SAIs participating in the WG AADA parallel audit on disaster risk reduction. SAIs found it to be a useful tool for collecting information on the individual audits and then for comparing results

<b>Audit Topic: DISASTER RISK REDUCTION</b>		<b>AUDIT MATRIX</b>		
<b>MAIN QUESTION 1: ARE THE ORGANIZATIONAL STRUCTURE AND STRATEGIES FOR DISASTER RISK REDUCTION ADEQUATE?</b>				
<b>SUB-QUESTION</b>	<b>CRITERIA</b>	<b>METHODOLOGY</b>	<b>FINDINGS</b>	<b>RECOMMENDATIONS</b>
<b>1.1. Within the framework of the integrated disaster management approach, are there any strategies and policies in place?</b>	<p>1.1.1 A national disaster strategy and action plan, encompassing all types of possible disasters, should be prepared and periodically updated:</p> <ul style="list-style-type: none"> <li>• duties, responsibilities and those entities concerned should be clearly defined;</li> <li>• duties should be prioritized and scheduled.</li> </ul> <p>1.1.2 Disaster management should primarily focus on the strategies and activities oriented towards disaster risk reduction.</p> <p>1.1.3 Goals, objectives and strategies established at national level should be reinforced with a sound financial and legal framework.</p>			

<b>1.2. Has an effective organizational structure been established for successful and coordinated implementation of disaster risk reduction?</b>	<p>1.2.1 There needs to be a legal framework that clearly establishes the duties, competences and responsibilities of the coordinator entity.</p> <p>1.2.2 The entity responsible for the coordination should be equipped with human, financial and other resources necessary to plan, coordinate and monitor disaster risk reduction with an integrated approach.</p>			
<b>1.3. Are the management tools being effectively used in disaster risk reduction?</b>	<p>1.3.1 An up-to-date, lucid, correct, complete, integrated and practicable system suitable for planning and directing disaster risk reduction should be developed.</p> <p>1.3.2 Integrated information systems both at national and regional level should be established in a manner to support decision making processes and be made readily accessible by relevant entities.</p>			
<b>MAIN QUESTION 2: ARE THE PREPARATORY WORKS FOR EMERGENCY RESPONSE ADEQUATE?</b>				
SUB-QUESTION	CRITERIA	METHODOLOGY	FINDINGS	RECOMMENDATIONS
<b>2.1. Have the disaster and emergency aid plans been prepared at local level?</b>	<p>2.1.1 Local implementation plans should;</p> <ul style="list-style-type: none"> <li>- be prepared by considering local disaster risks.</li> <li>- comply with high level plans.</li> <li>- be realistic and feasible and tested to be feasible through field examinations.</li> <li>- be responsive to alternative scenarios and multiple disasters.</li> <li>- be prepared through high-level participation of all</li> </ul>			

	<p>relevant entities (including NGOs and universities).</p> <ul style="list-style-type: none"> <li>- be up-dated periodically.</li> </ul> <p>2.1.2 In the local implementation plans;</p> <ul style="list-style-type: none"> <li>- Roles and responsibilities should be explicitly defined.</li> <li>- In which activities the private sector and NGOs will be engaged should be determined.</li> <li>- Special groups (like the disabled, the aged and children) should be taken into consideration.</li> </ul> <p>2.1.3 Plans should include an infrastructure operating with alternative systems, which would enable effective communication among relevant entities and inform the public on regular basis during the disaster.</p>			
<p><b>2.2 Are training and awareness raising activities adequate, which are organized within the scope of disaster response?</b></p>	<p>2.2.1 Trainings and awareness raising activities should be planned, conducted and monitored as part of the overall strategy.</p> <p>2.2.2 Trainings should be organized within the framework of accredited training programs and materials to be designed in cooperation with relevant entities.</p> <p>2.2.3 Initiatives taken towards raising the awareness of the society should be effectively managed and participation of volunteers should be handled according to a plan.</p>			
<b>MAIN QUESTION 3: WHAT IS THE EXTENT TO WHICH RESIDENTIAL AREAS ARE PREPARED TO DISASTERS?</b>				
<b>SUB-QUESTION</b>	<b>CRITERIA</b>	<b>METHODOLOGY</b>	<b>FINDINGS</b>	<b>RECOMMENDATIONS</b>
<p><b>3.1. Is urban planning made with due regard to risk of disaster?</b></p>	<p>3.1.1 Construction plans should be prepared and adjustments to these should be made by giving due regard to disaster risks.</p> <p>3.1.2 Disaster prone settlement areas should be</p>			

	identified in line with micro zoning maps and local integrated disaster maps, and conservation plans should be prepared for such areas.			
<b>3.2. Are the efforts effective in ensuring current building stock to be resilient to possible disasters?</b>	<p>3.2.1 There should be a mechanism that ensures construction of buildings resilient to disasters.</p> <p>3.2.2 Retrofitting and demolition-construction works should be conducted according to short and long-term plans and within the scope of priorities established based on risk assessments. Plans, targets and budget should be correlated.</p> <p>3.2.3 The urban transformation projects should be implemented transparently and in a manner to contribute to disaster risk and hazard reduction.</p>			

## Appendix 8

### Audit Criteria - examples from audits of disaster risk reduction

#### Performance audits

*Australia- Prevention of Natural Hazards: Use of resources from the disaster fund (2009)*<sup>12</sup>

- Governance and management structures for overseeing the development and delivery of the Australia-Indonesia Partnership for Reconstruction and Development (AIPRD);
- arrangements to plan assistance, and manage risks, including those relating to fraud and corruption;
- the clarity and transparency of financial management arrangements;
- arrangements for monitoring, evaluating and reporting on the AIPRD program.

*Canada - Emergency Management – Public Safety Canada (2009)*<sup>13</sup>

- We expected that Public Safety Canada would exercise leadership by coordinating federal emergency management activities, as described in legislation and policies.
- We expected that Public Safety Canada would coordinate federal emergency management activities with those of the provinces and territories to provide timely and coordinated support to communities in an emergency.
- We expected that Public Safety Canada would regularly test and exercise federal emergency management plans.
- We expected that Public Safety Canada would have a risk-based plan to lead and coordinate critical infrastructure protection efforts, and to reduce vulnerability to cyber attacks and accidents, by:
  - ✓ adopting an all-hazards approach
  - ✓ agreeing upon roles and responsibilities for the federal government and others
  - ✓ determining what critical infrastructure should be protected
  - ✓ assessing the threats and risks to these assets
  - ✓ prioritizing risks and resources to protect critical infrastructure
  - ✓ implementing protective programs
  - ✓ developing measures to monitor and assess effectiveness
- We expected that Public Safety Canada and selected federal entities would use a risk-based approach to identify the resources needed and to coordinate the response to and recovery from emergencies.
- We expected that Public Safety Canada would promote a common approach to emergency management, including the adoption of standards and best practices.
- We expected that Public Safety Canada, together with its federal partners, would provide emergency management training, based on a needs assessment and risk-based plan.

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<sup>12</sup> <http://www.rechnungshof.gv.at/berichte/berichte-aus-vorjahren/2009/bund/weiter/3.html>

<sup>13</sup> [http://www.oag-bvg.gc.ca/internet/docs/parl\\_oag\\_200911\\_07\\_e.pdf](http://www.oag-bvg.gc.ca/internet/docs/parl_oag_200911_07_e.pdf)

*The Netherlands – Preparation for disaster management (2000)*

- Central government policy should be implemented by municipalities.
- The Minister of Home Affairs should be active in stimulating municipalities and other entities to be prepared for disasters and to cooperate in a coordinated manner.
- Agencies should be involved in disaster management cooperation.
- Risk assessment and analysis should be conducted in a structured and systematic manner.
- Disaster management plans should be developed on the basis of risk assessments.
- Disaster management plans should be kept up to date.
- Relevant professionals should be trained properly.
- Disaster management plans should be tested in practice (via drills, etc.).
- The Minister of Home Affairs should have enough management information to be able to monitor the disaster risk reduction of municipalities and other entities.

*The Netherlands - Counter-Terrorism Alert System (ATb)(2008)<sup>14</sup>*

- A good procedure should be in place to transform a threat into an alert.
- That procedure should be implemented (does it work in practice?).
- The system related to other projects and procedures should be well-designed without overlap or blind spots.

*Turkey - How Well Is Istanbul Getting Prepared for the Earthquake?(2002)<sup>15</sup>*

- There should be one institution initially responsible for the planning, coordination and execution of the activities regarding earthquake preparations, which has the authority to use the budget, staff and instruments and that is authorized to provide cooperation among institutions.
- Activities should be managed according to the data obtained from the Disaster Management Information System. The data have to be up to date, clear, accurate, precise, integrated and easily accessible. The results obtained should be reported after being analyzed periodically. In disaster preparation plans, the issue of who will do what, where, when and how should be clearly defined, and adequate staff training should be provided.
- Precautions that will diminish fire danger should be given priority; in this context, early warning and emergency intervention systems should be established as soon as possible.
- In Building Development Plans and their modifications, the selection of settlement areas should be based on a land survey.
- Istanbul's buildings should be inventoried and earthquake risk analysis should be performed; based on this analysis, the reaction of buildings in the face of a possible earthquake should be determined.

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<sup>14</sup> [http://www.courtofaudit.nl/english/Publications/Audits/Introductions/2008/06/Counter\\_Terrorism\\_Alert\\_System](http://www.courtofaudit.nl/english/Publications/Audits/Introductions/2008/06/Counter_Terrorism_Alert_System)

<sup>15</sup> [http://www.sayistay.gov.tr/english\\_tca/Performance/IstanbulEarthquake.pdf](http://www.sayistay.gov.tr/english_tca/Performance/IstanbulEarthquake.pdf)

## Financial audits

*Czech Republic - Funds for programs relating to flood protection (2004)*<sup>16</sup>

- Legality

*The Netherlands - The C2000 communications network and integrated emergency switchboard (2000)*

- Budget estimates,
- reasoning behind cost surpluses,
- budget and cost monitoring,
- project management,
- accountability towards parliament.

*The Philippines - the Annual Audit Report on the Office of Civil Defense (2008)*

- Manual on the National Government Accounting System.
- Commission on Audit Circulars, Memoranda.
- Agency guidelines and manual of operations on implementation.
- Government rules and regulations on disbursement/expenditure.
- the government procurement reform act.

*The Philippines - Hazard mapping and assessment for effective community-based disaster risk management (READY)(2008)*

The audit was conducted in accordance with;

- the provision of the Specimen Terms of Reference,
- International Audit Standards and principles and procedures prescribed for the United Nations with respect to the audit of project expenditure, which includes all disbursements listed in the quarterly financial reports submitted by the NDCC-OCD and the direct payments processed by the United Nations Development Program (UNDP).

## Mixed/integrated audits

*Ukraine – International coordinated audit of Chernobyl shelter funds (2007-8)*<sup>17</sup>

- Achievement of indices on effectiveness set with regard to the relevant budgetary programs;
- the ability of existing emergency services to respond to emergencies, as defined by the appropriate inspections;
- the provision of public and individual non-military units with radiation and chemical protection equipment;
- installation of the automated early warning systems in potentially dangerous and hazardous objects;

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<sup>16</sup>

<http://www.nku.cz/scripts/detail.asp?id=877>

<sup>17</sup> [www.ac-rada.gov.ua/control/main/en/publish/article/1176147](http://www.ac-rada.gov.ua/control/main/en/publish/article/1176147)

- public awareness of the situation of civil protection, education of public safety, preventing injury and death due to emergencies.

## Appendix 9

### Audit Findings/Conclusions and Recommendations - examples from audits of disaster risk reduction

*Australia - Prevention of Natural Hazards: Use of resources from the disaster fund (2009)*

- Split competences make it difficult to handle emergencies consistently and adopt the appropriate procedures.
- It is not possible to prepare for disaster risks against the will of local communities or without their consent to contribute financially.

*Canada - Emergency Management – Public Safety Canada (2009)*

- The Privy Council Office and Public Safety Canada need to ensure that all components of the Federal Emergency Response Plan are complete and must obtain government approval for the plan.
- A consistent risk management approach is lacking. Recommendation: as stipulated in the Emergency Management Act, Public Safety Canada must establish policies and programs and provide advice for departments to follow when identifying risks and developing their emergency management plans.
- There has been progress in developing a government operations centre.
- Lessons learned have not been used to improve emergency response.
- Coordination is unclear for responses to chemical, biological, radiological, nuclear, or explosives emergencies. Recommendation: As stipulated in the Emergency Management Act, Public Safety Canada should ensure that its coordination role for the federal response to an emergency is well-defined and that the operational policies and plans that departments will follow are updated and consistent.
- Standards to promote interoperability are still under development.
- A strategy for protecting critical infrastructure has been slow to develop.
- Canada's critical infrastructure remains undetermined.
- The energy and utilities sector is making progress on protecting critical infrastructure.
- Cyber security has recently received more attention, but significant challenges remain. Recommendation: Based on the responsibilities outlined in the Emergency Management Act, Public Safety Canada should provide policies and guidance for departmental sector heads to determine their infrastructure and assess its criticality, based on risk and its significance for the safety and security of Canadians; it should establish policies and programs to prepare plans to protect the infrastructure.

*The Netherlands - Preparation for disaster management, (2000)*

Management Information System

- The Minister should improve the quality of the disaster management policy by making it more specific and by monitoring and supervising implementation. The Minister needs to enhance his management information system so as to be able to monitor and supervise the implementation of disaster management and intervene where necessary. This management information system should also serve for accountability.

Coordination

- The minister should enhance structural cooperation between relevant agencies with specific measures.

*The Netherlands - Counter-Terrorism Alert System (ATb)(2008)*

- Organisation meets the requirements but is not yet optimal: In broad lines, the organisation of the ATb meets the applicable requirements. Some 13 sectors of industry are now participating in the system and locations have been identified in these sectors that are a potential target for terrorist attack. The parties involved have also made agreements on the measures to be taken for each threat level (low, moderate or high). The practicality of the measures (for example hiring security firms or using specific equipment such as scanners), however, has not yet been studied. Capacity problems will probably arise if the threat level is high or prolonged. We therefore recommend that the practicality of the proposed measures be assessed.
- Confusing and unwieldy preventive systems: In addition to the ATb, other initiatives have been taken to increase the security of critical sectors, for example the Critical Infrastructure Protection measures (BVI). The BVI is coordinated by the Minister of the Interior and Kingdom Relations (BZK) and the ATb by the Minister of Justice. This does not facilitate an integrated approach. Local parties and sectors find the co-existence of different preventive systems for different types of threat confusing and unwieldy. We recommend that central government take action to arrive at the simplest *modus operandi* for all involved.
- The National Counter-Terrorism Coordinator (NCTb) fulfils its management function inadequately: The NCTb inadequately fulfils its function as manager of the ATb chain. Such a function is essential. Whether the ATb will actually speed up decision-making to prevent attacks will depend in part on good cooperation between public and private parties. Local authorities, however, do not always know what is expected of them. Coordination of industry, authorities and the police has had mixed results. We recommend that the Ministers of Justice and BZK clarify the management function so that there is greater oversight of the ATb's operation.

*Turkey - How Well Is Istanbul Getting Prepared for the Earthquake?(2002)*

A New Management Approach

- To organize Istanbul's preparedness for a possible earthquake in the best possible way and to minimize the likely damage, there is a need for a new management approach. To this end, the desired outputs that are to be achieved in the short, medium and long term should be clearly set and, at the same time, institutions that have a role and function in obtaining these outcomes should work in cooperation.

Coordination

- Achieving targeted results depends on the development of cooperation among public institutions based on accountability relations. In cooperation established on the grounds of accountability, who will be responsible for what and how long, resource needs and allocations, commitments and expectations should be clearly determined.

Planning

- Public institutions should start working in cooperation within the framework of accountability, relevant public institutions should set their objectives and develop strategies and action plans in order to reach set objectives. Additionally, Istanbul should be integrated into the strategic plan.
- Necessary measures should be taken to carry out damage assessment and designation of beneficiaries properly and within the shortest possible time.

Technical Personnel

- A sufficient number of technical staff who are to carry out damage assessment activities and designate beneficiaries should be trained beforehand.

*Ukraine - International Coordinated Audit of Chernobyl Shelter Funds, (2007-08)*

- Establish specific performance benchmarks for the project that need to be met before additional pledges of funds are made in the future;
- Facilitate accountability and transparency as the Project is financed by the EBRD;
- Audit contract awards, planning, implementation, acceptance and invoicing under the criteria of regularity and performance in order to evaluate the effectiveness of the CSF's mission performance.

*Canada - Emergency Management – Public Safety Canada (2009)*

- The Privy Council Office and Public Safety Canada should ensure that all components of the Federal Emergency Response Plan are completed and should obtain government approval for the plan.
- As stipulated in the Emergency Management Act, Public Safety Canada should establish policies and programs and provide advice for departments to follow when identifying risks and developing their emergency management plans.
- As stipulated in the Emergency Management Act, Public Safety Canada should ensure that its coordination role for the federal response to an emergency is well-defined and that the operational policies and plans that departments will follow are updated and consistent.
- Based on the responsibilities outlined in the Emergency Management Act, Public Safety Canada should provide policies and guidance for departmental sector heads to determine their infrastructure and assess its criticality, based on risk and its significance for the safety and security of Canadians; it should establish policies and programs to prepare plans to protect the infrastructure.

## Appendix 10

### Performance Audit of Disaster Preparedness in India<sup>18</sup>

#### Context

The Disaster Management Act became law in 2005. This instituted the National Disaster Management Authority (NDMA) as the apex body at national level for formulating and monitoring disaster management policy. The NDMA was to be chaired by the Prime Minister and was to approve the National Plan for Disaster Management which was prepared by the National Executive Committee.

#### Results

The SAI of India found there to be critical gaps in the level of preparedness for disaster. The NDMA was found to be ineffective because it possessed inadequate information and control over progress at state and individual project level. There was not enough coordination between the NDMA and individual ministries with responsibility for aspects of disaster preparedness and roles and responsibilities at national level were not clearly specified.

Key findings include, inter alia:

- The National Plan for Disaster Management had not been formulated even after six years of the Disaster Management Act;
- None of the major projects taken up by the National Disaster Management Authority was completed;
- National Disaster Response Fund was utilised for various purposes other than those stated in the Government of India (GOI) guidelines;
- The surveillance project for Biological Disasters did not receive regular data reports from all states which critically undermined the project objectives;
- The regulatory response mechanism to trace and discover lost or orphan radioactive sources was not effective;
- The satellite based Communication Network was not fully operational after more than six years of receipt of the communication equipment;

- Only seven states had raised their State Disaster Response Forces;
- Only eight states had prepared Emergency Action Plans for 192 large dams against the targeted 4728 large dams in 29 states as of September 2011;
- A modernization project to enhance the weather forecasting capabilities was not completed. Only 47.68 per cent funds could be utilized till March 2012;
- Most projects regarding the dissemination of data to stakeholders were still incomplete. In many cases, the equipment procured for these projects were lying uninstalled;
- The Ministry of Earth Sciences seems to be unaware of its role in disaster management. Comprehensive documentation and reporting of nuclear and radiological disasters, forest fires and chemical disasters was badly needed.'

### **Recommendations**

The SAI of India recommended more timely and coordinated planning at all levels. The institutions at central level should improve coordination between the many institutions responsible for disaster preparedness and monitor the implementation of guidelines and the use of resources. Early warning, mitigation and prevention measures should be devised where they are not yet in place. The dissemination of guidelines and information to the state level, individual projects and to individuals should be improved.

## Appendix 11

### Acronyms

**3Es** – Economy, efficiency and effectiveness

**FEMA** – Federal Emergency Management Agency. The FEMA is an agency of the United States Department of Homeland Security. The agency's primary purpose is to coordinate the response to a disaster that has occurred in the United States and that overwhelms the resources of local and state authorities.

**G20** - The Group of Twenty Finance Ministers and Central Bank Governors is a group of finance ministers and central bank governors from 20 major economies: 19 countries plus the European Union, which is represented by the President of the European Council and by the European Central Bank. The purpose of the G20 is to bring together systemically important industrialized and developing economies to discuss key issues in the global economy.

**GIS** – Geographic Information System

**GPS** – Global Positioning System

**HFA** – Hyogo Framework for Action. In January 2005, 168 Governments adopted a 10-year plan to make the world safer from natural hazards at the World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan. The Hyogo Framework is a global blueprint for disaster risk reduction efforts during the next decade. Its goal is to substantially reduce disaster losses by 2015 - in lives, and in the social, economic, and environmental assets of communities and countries. The Hyogo Framework offers guiding principles, priorities for action, and practical means for achieving disaster resilience for vulnerable communities. The Yokohama (1994), the Kobe (2005) Conferences and the HFA have set new objectives and criteria to reduce disaster risk.

**INTOSAI** - International Organisation of Supreme Audit Institutions

**INTOSAI GOV** – INTOSAI Guidance for Good Governance

**INTOSAI GOV 9250** – The IFAF: guidance on improving information on financial flows of humanitarian aid.

**ISSAI** – International Standards of Supreme Audit Institutions. Auditing standards issued by INTOSAI.

**IT** – Information Technology

**NDMSS** – National Disaster Management Support System

**NGO** – Non Governmental Organisation

**OECD** – Organisation for Economic Co-operation and Development

**PO** – Public Organisations

**RS** – Remote Sensing

**SAI** - Supreme Audit Institution

**UN** – United Nations

**UNISDR** – United Nations International Strategy for Disaster Reduction

**WG AADA** - Working Group on Accountability for and the Audit of Disaster-related Aid.

## Appendix 12

### Glossary

*(This glossary does not repeat terms defined in the ISSAI 1003, Glossary of terms to the INTOSAI Financial Audit Guidelines).*

**Aid:** Voluntary transfer of resources from one country to another.

**Anti-fraud and corruption strategy:** Outlines the commitment to minimising the risk of loss to the organisation resulting from fraud and corruption.

**Audit procedures:** Techniques used by the auditor in gathering audit evidence to substantiate the conclusions of the audit. Examples of audit procedures in financial audit are observing assets to verify existence and amount, collecting independent confirmations from external parties and evaluating internal control. Audit procedures are indicated in the audit programme.

**Audit process:** An audit process is a review of an entity's operating mechanisms in line with the applicable laws, regulations and standards. It follows a sequential order of steps by the auditor in the examination of the records. The audit process may vary depending upon the nature of the engagement, its objectives, and type of audit assurance desired. The process includes understanding the environment, conducting auditing procedures and tests, appraising the audit results, and communicating the results to interested parties.

**Bilateral aid:** Aid provided directly by a donor to an aid recipient country.

**Building code:** A set of ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.

**Collusion:** A secret agreement between two or more individuals for a deceitful or fraudulent purpose. This is one of the most difficult types of fraud to expose.

**Contingency planning:** A management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations.

**Co-ordinated audit:** A co-ordinated audit is either a joint audit with separate audit reports to the SAI's own hierarchy or legislature or a parallel audit with a single audit report in addition to the separate national reports.

**Corruption:** The abuse of entrusted power for private gain. Corruption usually comprises illegal activities, which mainly come to light only through audits, investigations, scandals or prosecutions.

**Deterrent:** Fraud and corruption deterrence is the proactive identification and removal of the causal and enabling factors of fraud and corruption. Visible activity by auditors can act as a deterrent to potential perpetrators of fraud and corruption.

**Development aid:** Official financing administered with the promotion of the economic development and welfare of developing countries as the main objective.

**Disaster:** A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

**Disaster-related aid:** Aid provided to help people, who are victims of a natural disaster or conflict, meet their basic needs and rights. The aid can be to fund disaster-preparedness measures or activities arising as a consequence of disasters.

**Disaster management:** The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies, and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards, and to bring back life (rehabilitation and reconstruction)

**Disaster management cycle:** Shows the sequence of events related to the organisation and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies in order to lessen the impact of disasters. It comprises a pre-disaster phase and a post-disaster phase, including activities of mitigation, preparedness, emergency response/relief, rehabilitation, and reconstruction.

**Disaster risk:** The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

**Disaster risk management:** The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

**Disaster risk reduction:** The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

**Donor:** Party which donates money, goods, or services voluntarily.

**Early warning system:** The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

**Emergency:** A serious situation or occurrence that happens unexpectedly and demands immediate action.

**Emergency phase:** The phase immediately following the occurrence of a disaster. It covers emergency response and relief activities and the first rehabilitation activities. It can last from a few days to several months, depending on the nature of the disaster and on the circumstances and type of the disaster.

**Emergency relief:** Financial assistance, goods or services made available to individuals and communities that have experienced losses due to disasters.

**Emergency response:** The efforts made to mitigate the impact of a disaster on the population and the environment.

**Ex-post control:** The audit carried out by SAIs or other statutory external auditors of the accounting records, the underlying transactions and/or issues of economy, efficiency and effectiveness of the use of aid.

**Fraud investigation:** Process followed to determine whether fraud has taken place and to gather evidence if fraud has occurred.

**Geographical Information Systems (GIS):** a computerised system that facilitates data entry, storage, analysis and presentation especially for spatial (geo-referenced) data.

**Global Positioning System:** Global Navigation Satellite System (GNSS) developed by the United States Department of Defence

**Hazard:** A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property loss, loss of livelihoods and services, social and economic disruption or environmental damage.

**Humanitarian aid:** Humanitarian aid is aid and action designed to save lives, alleviate suffering and maintain and protect human dignity during and in the aftermath of emergencies. The characteristics that mark it out from other forms of foreign assistance and development aid are that it is intended to be governed by the principles of humanity, neutrality, impartiality and independence and it is intended to be short-term in nature.

**Individual disaster response:** The primary actions taken immediately by those on the ground following the disaster to secure the safety of individuals, including rescue, the administration of first aid and the provision of emergency supplies.

**Joint audit:** A coordinated audit in which key decisions are shared. The audit is conducted by one audit team composed of auditors from two or more autonomous auditing bodies who usually prepare a single joint audit report for presentation to the respective hierarchies or legislatures.

**Man-made disaster:** A disaster that is caused by man-made hazards, such as negligence, or failures in the system.

**Mitigation:** The lessening or limitation of the adverse impacts of hazards and related disasters.

**Multilateral aid:** Aid channelled via an international organisation active in development (e.g. World Bank, UNDP) to an aid recipient country.

**National Integrity System:** The sum of all our institutions, laws, and efforts in stopping corruption.

**Natural disaster:** A disaster that is caused by natural hazards, for example earthquakes, tsunamis, volcanic eruptions, flooding, crop failure, etc.

**Parallel audit:** A coordinated audit for which the decision is taken to carry out similar audits with shared methodology and audit approach. The audit is conducted more or less simultaneously by two or more autonomous auditing bodies, but with a separate audit team from each body, usually reporting only to its own hierarchy or legislature and only on matters within its own mandate.

**Preparedness:** The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

**Prevention:** The outright avoidance of adverse impacts of hazards and related disasters.

**Public awareness:** The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards.

**Reconstruction phase:** The phase during which populations work towards full resumption of services plus preventive measures.

**Recovery:** The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

**Red flags:** Indicators or warning signs of fraud and corruption.

**Rehabilitation phase:** The restoration of basic services and functions which begins shortly after disaster strikes and continues until the reconstruction phase is underway.

**Resilience:** The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

**Response:** The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

**Technological hazard:** A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

**Vulnerability:** The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

*Sources: This glossary was compiled from the following main sources:*

- ✓ *UNISDR Handbook on terminology:*  
[http://www.unisdr.org/files/7817\\_UNISDRTerminologyEnglish.pdf](http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf)
- ✓ *OECD glossary of Statistical terms:* <http://stats.oecd.org/glossary>
- ✓ *OECD-DAC Glossary of key term and concepts:*  
[http://www.oecd.org/document/32/0,3746,en\\_2649\\_33721\\_42632800\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/32/0,3746,en_2649_33721_42632800_1_1_1_1,00.html)
- ✓ *IFAC Handbook Glossary of Terms:*  
<http://www2.accaglobal.com/library/technical/auditing/intstandards/2473361>

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